

**Rapid Transit Routing in Winnipeg:  
Determining Factors for Corridor Selection**

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## **Abstract**

Past practices for determining the routes of bus rapid transit (BRT) corridors in Winnipeg, Manitoba, Canada have largely relied upon comparisons of quantitative factors. This research recommends qualitative factors to be incorporated into the evaluation process in order to present a more complete analysis of proposed transit routes. Key Winnipeg informants were interviewed from three groups: transit officials, planners, and developers. Each group has a vested interest in the establishment of new BRT corridors and the construction of transit-oriented development (TOD) around the stations. A fourth group, consisting of informants from Ottawa, were interviewed to provide insights from another city having long-standing rapid transit development. The research identified eleven factors that should be taken into consideration when evaluating and selecting the routes for BRT corridors in Winnipeg. A framework of recommendations was developed, with the two foundational factors of transportation value and long-term city-building providing a basis to expand on using three additional groups of factors – transit, development, and planning factors. There were five key conclusions drawn from this research. First, the selection of any bus rapid transit route alignment depends upon a combination of wide-ranging factors. Second, there is almost never one perfect route that satisfies all factors, necessitating balance and compromise. Third, many important factors are qualitative or speculative and depend on subjective judgement in order to assess them, with the quality of the assessment depending on the qualifications of the professionals performing it. Fourth, route evaluation must always consider the local context and needs. Fifth, it is important that any process for route evaluation be flexible and continue to evolve.

Key words: bus rapid transit, transit-oriented development, qualitative factors, route analysis.

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## **Abbreviations**

BRT: Bus Rapid Transit

LRT: Light-Rail Transit

TOD: Transit-Oriented Development

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# **1. Introduction**

## **1.1. Background and Context**

The city of Winnipeg faces a problem common to many North American cities. With ever-increasing suburban development, Winnipeg's infrastructure deficit continues to grow and the city cannot afford to continue to expand infrastructure and services in the same manner as it has over many decades. Developing in a more sustainable, compact manner means, among other things, investing in public transit. A key component of transit investment in Winnipeg is the construction of a network of rapid transit corridors that will serve as the backbone of the transit system. Rapid transit corridors are proposed to carry the highest volumes of passengers between major destinations, and for longer-distance trips across the city.

Debate about the benefits and potential of a rapid transit system in Winnipeg has been ongoing for decades. The City of Winnipeg opened its first phase of dedicated, grade-separated busway in April 2012. Negotiations are underway to expand the system based on the vision outlined in the *OurWinnipeg* documents *Sustainable Transportation* (City of Winnipeg, 2011c) and the *Transportation Master Plan* (City of Winnipeg, 2011d). The *Transportation Master Plan* identifies corridors, in some cases with multiple potential routes, but does not lay out how these routes should be selected. With the first phase of the Southwest Transitway having been in operation for five years, the effects on public transit ridership, quality of service, and the beginning of impact on adjacent development can begin to be evaluated, with the findings applied to future corridors to ensure the best possible routes are selected. The findings and recommendations following from this research can be applied to best leverage the projected benefits of future phases of rapid transit.

Winnipeg is in a position to realize a significant amount of future tax revenue from transit-oriented development along existing and planned rapid transit corridors. Rapid transit also offers an important opportunity to promote infill development and densification in existing built-up areas. This will result in a more compact, more sustainable urban form in the future. The success or failure of these plans will depend in large part on the specific corridors selected for the rapid transit routes. Once constructed, their alignments are unlikely to change for decades to come. It is expected that Winnipeg Transit officials,



political leaders, and property developers will be interested in the outcomes and findings of this research. The results should be helpful in guiding the long-term planning decisions of these stakeholders.

## **1.2. Problem Statement**

Winnipeg Transit is currently faced with deciding between multiple routes under consideration for new rapid transit corridors. The evaluation process that was used to select the preferred route for the Southwest Transitway route was based primarily on transit performance and existing land-use conditions. The long-term development potential along transit corridors is difficult to measure and consider amongst the numerous other factors because there is no readily adopted way of effectively evaluating this factor.

To address this situation, the research undertaken in this Major Degree Project explores the factors for route selection for rapid transit in Winnipeg. Multiple factors were examined, including the potential for increased densification and transit-oriented development (TOD), the quality of the resulting transit service to existing and new development, and engineering and cost considerations. Due to the nature of the research being directly applied in the context of the city of Winnipeg, this Major Degree Project took the form of a practicum. A list of factors for route selection were identified through a literature review and confirmed using interviews with key informants. The methods of route selection used by Ottawa, a city with similar characteristics, was examined and evaluated. The results were applied to develop a framework to evaluate the results of development along the future rapid transit corridors proposed in the *Our Winnipeg* plan (City of Winnipeg, n.d. a).

## **1.3. Research Questions**

The first main question posed for this research aims to understand the factors used to determine the routing of bus rapid transit (BRT) corridors in other cities, and whether or not these factors have been successful in influencing development. The second main question aims to determine what factors should be considered to evaluate the routing of BRT corridors in Winnipeg. Secondary questions attempt to delve further into how the routing of BRT corridors can be used to influence where development occurs and what form it takes, to leverage the positive effects of rapid transit corridors as a city-building tool. The specific research questions used are as follows:

1. **What factors and considerations have other cities used to determine the routing of bus rapid transit corridors, and have these been successful? If so, in what ways?**
  - a) What factors were considered most important in determining routes?
  - b) Have these factors changed over time from earlier corridors to more recent ones?
  - c) How has rapid transit influenced development adjacent to its lines and stations in these cities?
2. **What factors should be considered to determine the routes, and to guide the construction, of the rapid transit corridors proposed in *OurWinnipeg*?**
  - a) What factors should be considered to provide the greatest benefit to the long-term development of the City of Winnipeg?
  - b) What factors should be considered to maximize the connectivity and feasibility of transit-oriented development?
  - c) What factors should be considered to ensure that the planning principles in the City of Winnipeg's *Transit-Oriented Development Handbook* are implementable?
  - d) How do these factors differ between different styles of urban form (i.e. urban vs. suburban; built-up areas vs. greenfield sites)?
  - e) What role should stakeholders and the public have in identifying and determining the weighting of these factors?

#### **1.4. Research Methods**

Prior to conducting the research, a literature review of key background information was undertaken. This provided the foundation necessary to further inform the research questions, and provided the relevant background to identify the key informants to be included, and the relevant questions to be asked during the interview process.

The primary segment of the research consisted of a series of semi-structured interviews conducted with key informants between December 2015 and July 2016. Nine informants from Winnipeg were interviewed along with two from Ottawa, for a total of eleven interviews. The interview process is explained in more detail in section 3.4 *Key Informant Semi-Structured Interviews*. This style of interview offered the opportunity to generate primary data from professionals in the field of rapid transit and associated

development. The individuals selected for interviews had experience working for transit authorities, as planners with municipal governments and consulting firms, and as property developers involved in transit-oriented developments. The objective of the interviews was to obtain insight from informants on how they perceive bus rapid transit corridors may be able to generate transit-oriented development and transportation value, and what factors need to be considered to maximize the potential benefits. There was also a media analysis conducted in order to compare and contrast the key themes identified by the informants with the themes that were most covered by the media in recent years.

The intention of the data collection was to identify factors that can be used to guide the determination of the specific route alignments of the rapid transit corridors proposed in *OurWinnipeg*. The researcher did not expect to compile an definitive list but rather a reasonably comprehensive set of factors that can aid in evaluating the long-term city-building potential of a rapid transit route.

### **1.5. Significance of the Research**

Rapid transit is an important component of Winnipeg's future transportation network. The construction of rapid transit corridors provides the potential for the development and redevelopment of a number of sites along these corridors, many of which are vacant or underutilized. Rapid transit has the potential not only to spur development, but to promote and enable denser, more walkable new development. If implemented in the right locations and if implemented with appropriate strategies and consideration, rapid transit corridors have the ability not only to enhance public transit in Winnipeg, but also to promote development that is both less car-dependent and located in infill areas. There will inevitably be trade-offs between intrusion in existing right-of-ways, connectivity between destinations, and cost. Striking the right balance between these competing interests is critical yet difficult to achieve. Rapid transit and TOD are powerful planning tools that have the potential to help to shape a more sustainable future for Winnipeg and it is hoped that this research will aid in developing their full potential.

### **1.6. Biases and Limitations**

For the purpose of this research, it is assumed that the vehicular technology used on rapid transit routes will continue to be bus rapid transit, that is, buses travelling on concrete roadways. The means of propulsion may change from diesel to hybrid, electric, or hydrogen fuel cell, but any effects this may have on route choice are outside the scope of this

research. Likewise, potential future conversion from bus rapid transit to light-rail transit is also outside the research scope. This research also assumes that Winnipeg is likely to continue to make incremental changes in its transportation infrastructure away from automobiles and towards an increase in active transportation and public transit. Seismic shifts in the transportation reality, such as the relocation of all railways outside of Winnipeg, or the introduction of widespread tolling of vehicles on arterial roadways, are also considered to be outside the scope of this research.

The scope of this research is also limited by the constraints of a Master's level Major Degree Project. The research must limit the number of key informant interviews to those which can be effectively analyzed, although it would always be valuable to include additional perspectives. Likewise, the timescale of both the key informant interviews and media analysis is limited to a relatively short period of time. There are many macro factors that can influence transit ridership and property development, including the economic climate, employment rates, and fuel costs. These can change markedly from year to year, and are subject to change due to unforeseen circumstances, making it difficult to predict trends more than a year into the future with any degree of certainty. Similarly, demographic trends, such as an aging population, or an increased desirability for urban living, can change slowly but steadily, amounting to a significant shift over decades. This research is conducted at a particular point in time, and is unable to fully account for how these trends may influence public transit and development over many decades. Fortunately, many of the key informants identified have worked in their field for decades and were able to speak from a longer-term perspective.

In this research, 'factors' are defined as a range of potential quantitative or qualitative considerations that are found to influence the evaluation of a rapid transit route. 'Evaluation' is defined as the process of examining different route options based on predetermined factors in order to select the preferred option for a particular rapid transit corridor.

The researcher is currently employed by Dillon Consulting Limited, the consulting firm that undertook the majority of the route alignment and planning studies for the first and second phases of Winnipeg Transit's Southwest Transitway. The majority of this work was completed by Dillon prior to the commencement of the researcher's employment in May 2014, and the researcher has not worked on the Southwest Transitway since joining the firm. Nevertheless, this connection presents a potential conflict of interest that must be

acknowledged. This employment has also been beneficial for the researcher in terms of facilitating connections with key informants for interviews.

### **1.7. Chapter Outline**

This practicum is structured in five chapters. First, the Introduction chapter defines the problem that was addressed and the questions that were asked as part of this research. Second, the Review of Existing Transit Research chapter is a summary of the many background documents, previous Major Degree Project work, and scholarly articles that inform this research and provide a foundation upon which to build further research. Third, the Research Methods chapter explains the processes and methodology used for the semi-structured interviews with key informants. Fourth, the Interview Results chapter summarizes and analyzes the major themes uncovered in the research. Finally, the Synthesis of Results chapter draws conclusions from the interview results and formulates recommendations resulting from the research as well as discussing its implications for planners, transit officials, politicians, and others making decisions about bus rapid transit corridor routing in Winnipeg.

### **1.8. Summary**

Winnipeg is in the early stages of constructing a bus rapid transit network along dedicated corridors. The process for evaluating different options for the routing of a transit corridor does not currently include adequate consideration for the development potential and long-term city-building benefits of one route over another. This research identified key informants in Winnipeg and Ottawa who provided insight into the factors that should be considered when determining the routes of the rapid transit corridors proposed in the city's *OurWinnipeg* plan (City of Winnipeg, n.d. a).

## **2. Review of Existing Transit Research**

### **2.1. Introduction**

The literature review is divided into themes that inform the original research with findings from previous case studies of rapid transit in Winnipeg and other cities, as well as literature on bus rapid transit in general. These are the building blocks that provide a foundation for this research. The first theme looks at aspects of rapid transit in Winnipeg. This theme includes other major degree projects that are direct predecessors to this research and are important because their conclusions are the starting points for this research, which will further explore many of the same topics.

The themes of sustainable transportation, the relationships between land use and travel, and public perceptions of transit examine issues of broad importance to transit. Increasing environmental awareness and desire to live in more urban settings is reflected in the sources on sustainable transportation. The relationships between land use and travel provide insight into the effect transit-oriented development can have on travel choices. The public perception of transit theme examines the aspects of transit that are most important in influencing whether or not people choose to use public transit.

Finally, there are themes concerning the factors that influence transit-oriented development and evaluation of rapid transit routes. These provide insight into which conditions influence developers to build projects near transit stations, along with best practices in decision-making while choosing between different potential transit routes. These are based on examples and case studies from other cities in Canada and the United States that provide relevant experiences to be considered in the Winnipeg context.

### **2.2. Winnipeg-Specific Research**

Limited research has been conducted on the evaluation of the existing bus rapid transit in Winnipeg, especially in terms of assessing the long-term potential for development along BRT routes and their overall city-building qualities. There are two major degree projects from the University of Manitoba Department of City Planning that have begun to explore these fields and are reviewed here.

Christopher Baker's 2010 practicum, entitled *Testing the Benefits of On-street and Off-street Rapid Transit Alignments: Implications for Winnipeg's Southwest Rapid Transit Corridor*, examines the benefits of locating rapid transit alignments along arterial road

corridors in order to create more benefits in terms of transit-oriented development (TOD). On-street transit corridors in Cleveland and Minneapolis-St. Paul were studied in order to assess these benefits. The findings were applied to the Southwest Rapid Transit Corridor in Winnipeg and determined that a rapid transit corridor located on Pembina Highway would maximize the benefits to development in the corridor and not just to commuters between the suburbs and downtown. This is an important recent study specifically focusing on the Winnipeg situation. The findings from this research appear to be under-represented in the options that were examined for the choice of corridor selected for the second phase of the Southwest Rapid Transit Corridor (Baker 2010).

The other recent and relevant University of Manitoba practicum is by Vicky Reaney. Her 2011 research is entitled *Supporting Transit-Oriented Development along the Southwest Rapid Transit Corridor in Winnipeg: Recommendations for Station Area Planning*. Reaney's research questions explore the opportunities and challenges for transit-oriented development at strategic stations along the Southwest Rapid Transit Corridor in Winnipeg. She went on to examine the practical experience of local governments who are planning for transit-oriented development around rapid transit station areas.

Reaney provides case studies of precedents in Ottawa, Denver, and Boulder to offer recommendations for TOD in Winnipeg. The three recommendations are:

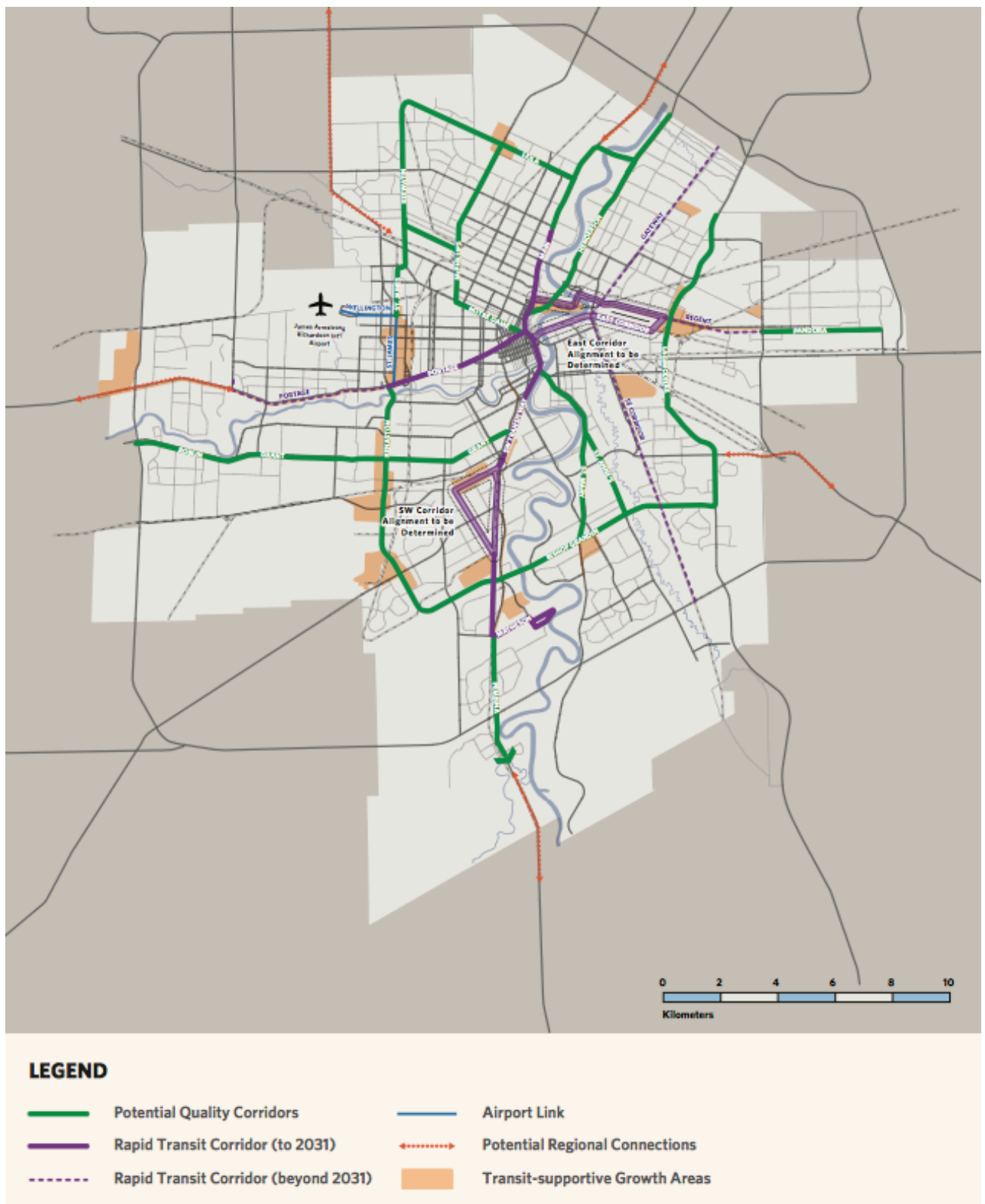
- i) to develop smart growth land use policies that direct growth to station areas....
- ii) to develop station area plans that indicate the permitted land uses, urban form and densities at station areas, and....
- iii) to create a zoning overlay for TOD to that embraces compact, pedestrian oriented development, mixed land uses and reduced off-street parking requirements (Reaney 2011, p.172-176).

Reaney's practicum is particularly relevant to this research, in that it will be important to ensure that this research extends rather than duplicates the existing research. This will be accomplished by examining the factors that enable and encourage TOD along an entire corridor, instead of individual stations. Specifically, the research will look at how TOD potential is affected by different alignments of a transit corridor, including greenfields, built-up areas, and directly along urban arterials. In this way, corridors can be selected in a manner that maximizes the ability to implement Reaney's TOD recommendations and ensure that they are as effective as possible.

These two documents were considered in detail because they have significant implications for this research. The documents examine the general implications of different route alignments, recommended policies for station and TOD areas. These documents provide a foundation for this research to build upon and further the study of rapid transit in Winnipeg. The current research will attempt to bring together the recommendations on station development with those on corridor selection to inform the decision-making process on specific corridor alignments.

A number of official planning documents adopted by the City of Winnipeg provide policy direction on transit and related development. These include the *OurWinnipeg* master plan (City of Winnipeg, n.d., a), specifically the *Sustainable Transportation* direction strategy (City of Winnipeg, 2011c). It identifies conceptual directions for rapid transit routes radiating outwards from downtown. *OurWinnipeg* also identifies the urban structure of different types of existing and proposed land use in the city, including major redevelopment sites. Many of these sites are near proposed rapid transit routes, and are prime candidates for large-scale TODs. The *Winnipeg Transportation Master Plan* further refines the routes of specific rapid transit corridors that are recommended to be built, along with proposed timelines for staging and preliminary cost estimates. The rapid transit corridors identified in the *Winnipeg Transportation Master Plan* are shown in Figure 1. Finally, the *Winnipeg Transit-Oriented Development Handbook* (City of Winnipeg, 2007) sets out the City of Winnipeg's vision for TOD. It is seen as providing benefits in terms of sustainability, land use, and providing more lifestyle options for residents. The handbook identifies six core principles of good TOD and tools that can be used to effectively implement TOD in Winnipeg.





**Figure 1: Rapid Transit Corridors identified in Winnipeg Transportation Master Plan (City of Winnipeg, 2011b)**

### 2.3. Sustainable Transportation

Many sources discuss the broader underlying issues of sustainable transportation and its importance in contributing to more walkable, liveable, and sustainable communities overall. *Resilient Cities* says that “A city needs many kinds of transportation and land use options, not just one type, to be resilient” (Newman, Beatley, & Boyer, 2009, p. 87). This goal of multi-modality needs to be socially accepted to be successful. *Social Change and Sustainable Transport* considers how proposed solutions to sustainable transportation problems “will succeed or fail on the basis of the social response to these different initiatives” (Black & Nijkamp 2002, p. xi). The authors stress the importance of achieving solutions that are not merely technologically practical but also readily accepted by society, as these will be more readily accepted and widely dispersed.

*An Introduction to Sustainable Transportation* (Schiller, Bruun, & Kenworthy, 2010) continues this theme by examining the policy, planning, and implementation initiatives that have been most successful in changing the transportation system focus and mindset. Moving from a system based around moving cars to one based on moving people has been successful in cities such as Vancouver and Portland, Oregon. Winnipeg would do well to adopt some of the best practices of these jurisdictions. Newman et al. (2009) assert that transportation mode choices are most affected by travel time, because “people in cities on average are willing to travel around half an hour to work and half an hour home again” (p. 89). Therefore, for cities to be resilient and sustainable, they need to be planned and constructed in such a way as to make trips on foot, by bicycle, and on transit safe, convenient, and no more than half an hour to key destinations. Key elements of Newman et al.’s (2009) vision for more resilient urban transportation systems include providing a transit system that is faster than traffic in all major corridors. These corridors then need to have viable centres located along them that are dense enough to support quality transit and which prioritize walking and cycling for short trips within these centres. If implemented effectively, people will not only drive less, but their overall distance travelled will decrease. It is a virtuous circle, because “...when people commit to transit, they may sell a car and even move closer to the transit, eventually leading to land use that is considerably less car-dependant” (Newman et. al. 2009, p. 90).

Robert Cervero’s *The Transit Metropolis* (1998) is a seminal text for rapid transit integration with city planning and deserves a thorough analysis here. Cervero examines

cities that have become, or are working towards becoming, successful transit metropolises. He defines this as being a city with

“a built form and a mobility environment where transit is a far more respectable alternative to traveling than is currently the case in much of the industrialized world. It is an environment where transit and the built environment harmoniously co-exist, reinforcing and enhancing each other in the process” (Cervero 1998 p. 4).

Of particular note is that Cervero does not require that public transit supplant the use of private vehicles or even hold the leading amount of mode share. Rather, a city judged to be a “transit metropolis is one where enough travelers opt for transit riding, by virtue of the workable transit-land use nexus, to place a region on a sustainable course” (Cervero, 1998, p. 4). This important distinction recognizes that it is neither probable nor feasible for most cities to experience a traumatic and sudden wholesale shift from automobiles to transit. When presented as a slow but steady shift towards more sustainable transit, more sustainable land use, and more sustainable transportation overall, it becomes a goal that is both realistic and desirable. Cervero stresses the importance of recognizing the “connections between transit and urbanization at the regional scale versus the local one” (Cervero, 1998, p. 4). Transit-oriented development is important, but it must be implemented and coordinated throughout an entire city in order to benefit the whole region. Isolated islands of TOD will not fundamentally change the transportation mentality of the city nor will individual developments realize their full potential unless they are part of a greater whole.

The approach taken to becoming a transit metropolis is not ‘one-size-fits-all’. Due to their population and area, most cities will not realistically achieve the high-density transit-dependent urbanism of Hong Kong or Manhattan. Rather, there are “legitimate approaches to forming sustainable yet low-density transit metropolises, namely through the design of more flexible forms of mass transit” (Cervero, 1998, p. 5). Cervero therefore presents four classes of transit metropolises. Adaptive cities have reshaped suburban growth around comprehensive transit networks; with rail service serving nodes of compact, mixed-use suburban communities, such as is the case in Copenhagen. Other cities have accepted low-density growth patterns and have focused on innovations in transit technologies or service to appropriately service these areas. Adelaide, Australia and Karlsruhe, Germany are portrayed as examples of this approach. Another approach is typified by the strong-core cities of Zurich and Melbourne. These two cities have used the

concentration of employment and services in the central area, along with comprehensive networks of tramways, to promote and enhance the primacy of their central business districts and the desirability of the streetcar-style neighbourhoods around them. The final category of hybrid cities examined by Cervero is considered a mix of both adaptive cities and adaptive transit. He states that cities in this category have “struck a workable balance between concentrating development along mainline transit corridors and adapting transit to efficiently serve their spread-out suburbs and exurbs” (Cervero, 1998, p. 6). Two examples of this style of transit development are particularly relevant to Winnipeg: Ottawa and Curitiba, Brazil. Both of these cities have developed comprehensive and effective bus rapid transit systems, providing rapid transit service across their respective cities at reasonable cost significantly below that of a rail network. Many other Latin American cities have followed Curitiba’s lead in constructing comprehensive and successful BRT systems.

Research in this area emphasizes the importance of developing cities that support the easy use of multiple transportation modes. It also examines the many different approaches to transit by cities around the world and emphasizes the importance of determining and implementing the best approach for the local context of any given city. This demonstrates the need for this practicum research to examine the links between transit and development in a Winnipeg-specific context. Effective ideas from other cities should be examined but must be considered in the local context so as to choose the most appropriate and effective approach for Winnipeg’s circumstances and goals. Many documents also examine the broader issues of creating communities that are sustainable and liveable, and the role that transportation policies and infrastructure play in working towards these goals.

#### **2.4. Relationships Between Land Use and Travel Demand**

New Urbanism is a planning movement that promotes returning to planning and design principles that were in use prior to the automobile-centric city building that has dominated in North America since the Second World War. This includes designing transportation systems with a renewed emphasis on public transit and pedestrians, and building TOD. A number of researchers set out to study the benefits of this style of planning, some with inconclusive results that “Overall, the transport claims of New Urbanist authors ought to be neither adopted nor discarded” (Boarnet & Sarmiento, 1998, p. 1166). Other researchers were more positive, stating that “compact, mixed-use, pedestrian-

friendly designs can ‘degenerate’ vehicle trips, reduce VMT [vehicle miles traveled] per capita, and encourage non-motorized travel” (Cervero & Kockelman, 1997, p. 216). Overall, the link between pedestrian and transit-oriented development and a decrease in vehicle trips is deemed to be complicated. This is due to the fact that it is very difficult to separate the effects of TOD from the many other factors that influence peoples’ transportation decisions. In their research, Cervero and Kockelman find that there is a higher mode share for public transit and walking in neighbourhoods with TOD, but note that “the results must be interpreted as being associative rather than causal” (Cervero & Kockelman, 1997, p. 216).

One reason why it is difficult to ascribe ridership benefits directly to TOD is “the possibility that persons choose their residential location based in part on how they wish to travel” (Boarnet & Sarmiento, 1998, p. 1166). This means that at least some of the people who are likely to choose to live in TODs are people who would prefer to travel by transit in general. These people would be taking transit regardless of the neighbourhood in which they live, and simply choose to live in a TOD because it makes their predetermined travel preference more convenient. They do not represent net new transit riders. A second reason given for the inconclusive findings on TOD’s ridership benefits is that transit ridership is deemed to be influenced more by city-wide planning and development than just the built form of the neighbourhood in which a person lives. Cervero and Radisch state that “Transit trips, which are generally longer, non-local trips, are more influenced by regional development characteristics and travel times among competing modes than by the physical make-up of residential neighbourhoods” (Cervero & Radisch, 1996, p. 140). Therefore, increasing transit ridership depends on planning and land use decisions across an entire city.

Robert Cervero’s book *Transit-oriented development in the United States: Experiences, challenges, and prospects* takes a strongly positive view of the benefits of TOD. He states that TOD increases transit ridership and helps to increase urban housing stock and curb urban sprawl and traffic congestion. Beyond increased ridership, TOD is seen to provide widespread benefits including “the revitalization of declining neighborhoods, financial gains for joint development opportunities, increases in the supply of affordable housing, and profits to those who own land and businesses near transit stops” (Cervero, 2004, p.134). The magnitude of the benefits realized from TOD are deemed to be greater in a strongly growing economy with increasing demand for new development.

Development in locations with good transportation connections is particularly valuable. Similarly, TOD is likely to provide more benefit in cities that are more congested. This generally means that larger cities are likely to experience more benefit from TOD than smaller cities.

Understanding the many city-building benefits of TOD as well as the limitations in directly quantifying ridership increases are valuable to this research. Including TOD as an integral component of rapid transit planning is seen as beneficial, although it should be considered along with a range of additional factors since previous research indicates that it is difficult to ascribe increased ridership solely to TOD.

## **2.5. Public Perceptions of Transit**

Rodier, Johnston, and Abraham's *Heuristic policy analysis of regional land use, transit, and travel pricing scenarios using two urban models* (2002) researches public perception of BRT along with several other modes of rapid transit. The scenarios and models used in this research were effective methods to identify many of the service features that are considered important, particularly for 'choice riders' that will cause them to choose transit over driving. This is achieved by forecasting the future outcomes of different transportation scenarios. A similar study was conducted for the Federal Transit Administration in Los Angeles. It found that

“it appears that the influence of the urban area through which a rapid transit service runs has a larger impact on overall perceptions than whether it is based on bus or rail technology” (Cain, Flynn, McCourt, & Reyes, 2009, p. 76).

This emphasis of location over mode was concluded because the Gold Line LRT was rated higher than the physically similar Blue Line LRT in terms of key intangible variables of safety and perception of fellow riders. This is determined to be because the Gold Line serves more affluent parts of Los Angeles than the Blue Line. Further affirming the conclusion that the running technology of rapid transit is less important than other factors is that the Orange Line BRT was perceived by riders to match the functionality standards and image qualities normally associated with rail, and rated just as highly as the Gold Line LRT. This is confirmed by a similar study in Columbus, Ohio, that concludes that “ignoring the impact of attitudes could lead to overestimating the impacts of the built environment on changes of travel behaviour” (Namgung & Akar 2015, p. 101)

Another aspect of public perception is examining which aspects of rapid transit people value most. *Bus Rapid Transit Features and Deployment Phases for U.S. Cities*, presented by Galicia, Cheu, Machemehi, & Liu (2009) take this approach in a summary of 28 BRT systems around the world. Common infrastructure and operational features are identified. The most important design goal for riders is found to be travel time savings and for transit authorities is ridership attraction. However, Namgung & Akar (2015) state that this is not always the case, with people living in low-density areas more sensitive to travel time and access to bus information, while people living in high-density areas are more sensitive to congestion and safety factors.

These documents are important background for this practicum because they identify a range of different factors and considerations that affect the perception and use of public transit. This goes beyond quantifiable transit metrics to incorporate the perceptions that transit riders have, and on which they are most likely to base their decisions for choosing transportation modes and where to live. These sources inform the research by establishing a framework of factors to be examined. They also establish a context of community development goals within which the contributions and role of transit can be examined. Considering which factors are most beneficial to existing and potential riders, as well as what these riders *perceive* to be most important to them are an important factor in determining BRT corridor selection criteria. This allows the practicum to examine the relationship between transit and development from a rider's perspective. This is directly connected to section 4.3 *Media Analysis*, which analyzes a cross-section of articles covering rapid transit in Winnipeg. Many of these articles contain quotes from transit riders or members of the public, and all of them discuss themes and topics about rapid transit that are of most interest or concern to the general public. Understanding riders' perspectives will assist in creating connected and feasible TOD such that future users of transit and future residents and customers of TODs will derive the maximum benefits from them.

## **2.6. Transit-Oriented Development Factors**

Loukaitou-Sideris (2010) examines case studies in Los Angeles County, California by looking at two different light-rail lines. The Blue Line from downtown Los Angeles south to Long Beach opened in 1990 and has strong ridership but has spurred very little development. The Gold Line from downtown Los Angeles northeast to Pasadena opened in 2003 and has only a third the ridership of the Blue Line, but has already spurred

significantly more TOD. The components identified as key attributes to encourage and enable TODs along rapid transit lines are to:

- Plan stations near people and activities
- Pre-plan for TODs
- Educate and involve the public
- Offer good urban design configurations
- Develop strong public/private partnerships
- Achieve better coordination among different public entities
- Find the right balance between ‘carrots’ and ‘sticks’
- Actively recruit pedestrian-oriented, transit-friendly uses
- Find a solution to the parking dilemma
- Make transit more appealing (Loukaitou-Sideris, 2010, p. 64-66)

Studying transit and TOD in Boston, Raine (2010) emphasizes the importance of technology in enhancing the appeal of transit. Real-time schedule updates and reliable service are identified as the most important aspects. Winnipeg’s attempt to incorporate these improvements into its rapid transit service will determine the success or failure of the system’s appeal to increase ridership.

Nelson, Appleyard, Kannan, Ewing, Miller, & Eskic (2013) draw five conclusions from their study of TOD along the BRT lines in Eugene-Springfield, Oregon. There are five key conclusions:

1. Successful developments require significant cooperation between transit agencies and private or non-profit developers.
2. If the market for development is not strong, the transit agency needs its own TOD program to facilitate development.
3. The perceived permanence of transit infrastructure is a critical factor for developers.
4. The route chosen for BRT must facilitate higher-density development by connecting existing major traffic destinations.
5. Financial incentives for TODs at BRT stations less important for attracting developer interest than an expedited permitting or rezoning process. Time is a critical factor in ensuring the financial viability of developments. (Nelson et. al. 2013, p. 52-53)

Loukaitou-Sideris asserts that good planning for TOD begins with the planning of the rapid transit route and location.

“Choosing a good station location is crucial to attracting new development around it. For developers, location is the most important attractor to and motivation for building at a particular site. The success of the Gold Line to attract new TODs was partly a result of the central location of its stations, in close proximity to the ‘front door’ of neighbourhoods, near other urban amenities and existing nodes and hubs of activity, such as schools, parks and



retail. In contrast, the failure of the Blue Line to stimulate development was partly due to the fact that the vicinity of its stations was mostly devoid of people and activities” (Loukaitou-Sideris & Banerjee, 1996, as cited in Loukaitou-Sideris, 2010, p.64-65).

Other research has quantified the financial benefits associated with proximity to transit. In Fairfax County, Virginia (outside Washington, DC) there is a premium of 2.5-3.5% for residential properties up to 6.6 miles around a Metro station. A similar premium for transportation access only exists up to 1.8 miles from highways. (Petitte, 2001, p. 3) Nelson, Eskic, Hamidi, Petheram, Ewing, & Liu (2015) studied office rent premiums with respect to LRT stations in Dallas, Texas. They found that premiums for office space extend up to 3km from transit stations. 75% of the full premium still applies at a distance of 0.4km, 50% at 0.9km, and 25% at 1.5km. (Nelson et. al. 2015) Therefore, they recommend that employment-based TOD planning should extend at least 1 mile (1.6km) from stations instead of the traditional ½ mile (0.8km) in order to more adequately represent the reality on the ground.

In a study for the National Center for Intermodal Transportation, Ratner & Goetz examined how TOD affects land use and urban form in Denver, Colorado (2010). They examine the state of TOD in the city of Denver and suburban municipalities and analyze how it is reshaping the land use and urban form throughout the metro region. Denver has recently built both LRT and BRT corridors and is planning additional corridors. The authors found that TOD has the most impact closest to downtown Denver. There were also distinct typologies of TOD with residential development around urban neighbourhood stations, retail and office around urban center stations, and larger mixed-use projects at major urban center stations. Although most of this development is quite recent, the findings are applicable to Winnipeg in terms of the recent introduction of rapid transit in a car-oriented city.

Nelson et. al. (2013) undertook a similar case study of Eugene-Springfield, Oregon to examine the effects of proximity to BRT stops on employment numbers. The metro area has approximately 300,000 people and the researchers note that BRT may provide for many more opportunities for smaller metropolitan areas to serve numerous job sectors. “Light-rail-like benefits may be achieved only in smaller metropolitan areas through BRT” (Nelson et. al. 2013, p. 53). The research compares employment in 2004 with 2010, with these points representing three years before and three years after the opening of the first

BRT line in the city. Due to the recession of 2008-09, Eugene lost thousands of jobs overall, but gained jobs within half a mile, and particularly within a quarter mile, of the BRT line. This suggests that proximity to BRT positively influences development.

## **2.7. Transit Route Evaluation Factors and Processes**

Different researchers have created lists of factors for the evaluation of rapid transit routes. Of those, three that have evaluated BRT routes are summarized in Table 1. Bent, Hiatt, & Singa (2008) conducted feasibility studies for on-street BRT in San Francisco and produced a framework for developing BRT to meet broad multi-modal goals for a corridor. In Chicago, Anderson & Ellis (2014) used liveability principles to create a set of criteria for assessing which existing bus routes in the city should be upgraded to BRT routes. They assessed each of these factors subjectively and then aggregated the scores in three equally weighted groups of 32.3% each: access to important trip generators, transit performance, and transit equity. The infill development potential factor was assigned a 3% weighting in the overall analysis, too low to have more than a minor impact in comparison with the other factors. Rahman (2011) has undertaken similar work in Miami and identified transit characteristics that are important for the creation of successful transit-oriented developments.

The many criteria identified in these three studies have been grouped into eight common categories in Table 1 in order to show the overlap between the studies as well as the different approaches taken. Many of these factors proved to be useful in identifying themes for grouping the results of the key informant interviews in Chapter 4.

Factors for evaluating new rapid transit routes and infrastructure are important. Of similar importance are the processes used to conduct the evaluation. In *Development and design of large infrastructure projects: disregarded alternatives and issues of spatial planning* (2007), Priemus observes that

“problems are often approached from extremely narrow terms of reference, from one favourite solution, whereby countless potentially worthwhile alternative solutions are dismissed out of hand or enter the picture too late” (Priemus, 2006, p. 626).

He states that infrastructure projects must be designed in context with their surroundings and not as standalone developments. He encourages the use of more collaborative design processes that incorporate a high level of stakeholder and public engagement.

<b>Theme</b>	<b>Bent et. al. San Francisco</b>	<b>Anderson and Ellis Chicago</b>	<b>Rahman Miami</b>
<i>Transit Operations</i>	Transit performance	Existing transit travel time	Frequency Flexibility of service
<i>Ridership</i>	Rider experience Equity	Existing transit ridership Transportation costs	Capacity Transfers
<i>Connectivity and Usefulness</i>	Pedestrian access Wayfinding ability	Connectivity to community services, educational institutions, entertainment venues, food stores, major medical care, major open spaces, and retail Population in walkshed	
<i>Employment</i>	Access to employment	Employment access	
<i>Development potential</i>		Infill development potential	Land use impacts Level of permanence
<i>Impacts on other users</i>	Traffic impacts Parking impacts Construction impacts		
<i>Aesthetics</i>	Urban design Landscaping		Aesthetics
<i>Environment</i>			Air and sound pollution Vibration

**Table 1: Factors to Assess BRT Routes**

This is critical because “the generation and acknowledgement of alternatives enhances the democratic process and the quality of public decisionmaking” (Priemus, 2006, p. 643). This is confirmed by successful BRT feasibility studies in San Francisco where “planners and public alike worked together to develop meaningful, measurable metrics that could be replicated for future transportation studies” (Bent et. al. 2008, p. 99).

The challenge of open-ended public consultation for complex transportation projects is that it is particularly difficult to weight the importance of intangible factors against each other for the final analysis. There was strong interaction between the managing

teams and their stakeholders in San Francisco which produced continuous refinement of their evaluation metrics. However,

“although planners were creative and largely successful in devising ways to present technical information to neighbourhood residents, the complexities presented by combining qualitative and quantitative metrics further complicated evaluation analyses” (Bent et. al. 2008, p. 99).

This is an important caution for this research, as more comprehensive, intangible criteria can be difficult to incorporate into a final decision.

A 2013 case study looks at the redesign of Webster Avenue, a major arterial street in the Bronx, New York City, to create an on-street BRT line with buses operating in reserved lanes. Along most of the corridor, the bus lanes are located offset, in the second lane from the curb, with parking and loading permitted in the curb lanes. There was a 19-23% improvement in bus speeds for the new BRT service over the former limited-stop route. A number of improvements to pedestrian infrastructure were also added, including additional crosswalks, physical medians for pedestrian refuge, and 14,000 square feet of new pedestrian space from reconfiguring intersections. All of these improvements to transit and pedestrian travel were achieved while also providing small increases to travel speed for vehicles along Webster Avenue. Traffic volumes increased in some areas and decreased in others, with no significant net change along the corridor as a whole. Overall, the physical infrastructure improvements resulted in a better transportation corridor for users of all modes. The researchers conclude that

“design is not a zero-sum game. The improvements made to the transit system and to pedestrian safety on Webster Avenue did not come with any net loss to private vehicles on the corridor, and the faster bus service with limited stops did not remove the need for the local service that provides greater accessibility. By thinking holistically about how each of these elements interacts with the others and by being judicious in how choices are made, better street design can be a true Pareto improvement” (Beaton, Bialostozky, Dougherty, Gouge, & Orosz, 2015, p. 35).

## **2.8. Summary**

The literature reviewed for this research identifies a number of important themes in the existing research on BRT. Case studies of Winnipeg and other cities demonstrate the best practices from elsewhere and their applicability in a local context. More broadly, there is emphasis on the importance of transit in creating more sustainable transportation networks and on the public perception of different transit technologies. The research on

developing and analyzing factors for assessment of BRT routes and TODs, as well as the processes by which to conduct evaluations, are particularly important for this research. This will provide the foundation by which to derive evaluative factors applicable to Winnipeg out of the interviews conducted with key informants. Chapter 3 describes the methods that were used in order to conduct the original research component of this practicum.

### **3. Research Methods**

#### **3.1. Introduction**

The literature review described in Chapter 2 provided the relevant background to identify the key informants and relevant questions for the interview process. The primary segment of the research consisted of a series of semi-structured interviews conducted with key informants in both Winnipeg and Ottawa. This style of interview was chosen to generate primary data from informants in the fields of transit, planning, and development. This chapter describes the methods used to undertake this research.

#### **3.2. Ethics**

A full ethics protocol was submitted to the University of Manitoba Fort Garry Campus Joint Faculty Research Ethics Board (JFREB) in August 2015. The ethics approval was granted until September 1, 2016, and subsequently extended until September 1, 2017. Key informants were selected and contacted using publicly available information from municipalities and transit agencies, as well as prior contacts known to the researcher. Informants were selected based on their level of relevant professional experience and their understanding of the issues being studied. No key informants were from a vulnerable group.

Written consent was obtained prior to conducting each of the interviews. Informed consent forms were created based on the University of Manitoba's ethics protocol and approved by the JFREB. These consent forms were provided to the informants prior to the start of the interviews. They were signed prior to the commencement of the interview process and retained on file for the duration of the research. At the beginning of each interview, informants were given background information on the nature of the research and an overview of the questions that were asked. The researcher also explained that they were permitted to withdraw from the interview at any time and for any reason.

Confidentiality of the individual informants was ensured by coding data and removing any references to their specific positions, although general job descriptions were included. Pseudonyms were not deemed necessary by any participants. All written notes and audio recordings were securely stored in accordance with the University of Manitoba ethics criteria.

### **3.3. Corroborating Information**

Ottawa was chosen to provide corroborating information as the Canadian city most relevant to Winnipeg in terms of its BRT system.

#### **3.3.1. Rationale for selection of Ottawa**

In order to inform the research on BRT in Winnipeg and provide a point of comparison, it was deemed necessary to select another city to include in the research. This city should have a longer history of experience with rapid transit than Winnipeg in order to provide corroborating information to the Winnipeg experience over a longer timeframe. Ottawa was chosen as the most relevant city to provide corroborating information for the Winnipeg context because it met all of the following criteria:

1. Using bus rapid transit as the primary technology on the city's rapid transit network.
2. Having bus rapid transit in place for a period of time long enough to observe its influence on development.
3. Having a metropolitan population of a scale similar to that of Winnipeg.
4. Having jurisdictional and economic situations approximating those of Winnipeg.

Other cities that were considered included Edmonton and Calgary. While these Prairie cities have a built form more similar to Winnipeg in some respects, their rapid transit systems use LRT instead of BRT technology, which would be expected to produce different results in terms of the style and scale of adjacent development. York Region and the City of Brampton in the Greater Toronto Area only recently built their first BRT lines. As these systems have only been in operation since 2005 and 2010, respectively, influence on development can only be evaluated in the short-term context, not a long-term context. Additional cities that were identified as potentially informative were Pittsburgh and Cleveland in the United States, Curitiba in Brazil, and Adelaide in Australia. These international cities were deemed to have too many variations in jurisdiction and economic conditions to be directly comparable to Winnipeg.

#### **3.3.2. Background and history of Ottawa bus rapid transit**

The Regional Municipality of Ottawa-Carleton undertook a rapid transit appraisal study in the late 1970s that selected BRT as the preferred mode for Ottawa's rapid transit network. The first sections of the Transitway, the branding for the BRT routes, opened in 1983, and are operated by Ottawa's transit agency OC Transpo. The Transitway routes

operate in on-street bus lanes in downtown Ottawa, and along dedicated bus-only roadways and freeway lanes in the rest of the city. The system has been progressively expanded since it first opened, and further extensions are currently planned and under construction.

Transit ridership in Ottawa has increased since the Transitway opened in 1983. “While peak-period transit ridership decreased across Canada in the 1980s, it grew by 10 percent in Ottawa-Carleton” (Parsons Brinckerhoff, 1995, p. 137). The late 1980s and early 1990s saw ridership decline in Ottawa during a period of economic recession. From a recent nadir of 64.8 million rides in 1996 (partly due to a transit strike that year), ridership grew consistently to a zenith of 103.5 million rides in 2011, before settling out most recently at 97.1 million rides in 2014 (OC Transpo, n.d.). This represents a 59.7% increase in ridership over the 15 years from 1996 to 2011, while the population of the OC Transpo service area (the current City of Ottawa since the 2001 amalgamation) increased by only 22.5% over the same time period.

The on-street bus lanes in downtown Ottawa operate along Albert Street and Slater Street, an east-west couplet of one-way streets. There is a significant concentration of employment in the central business district, and a high proportion of jobs are in the public sector with standard 8:30am – 4:30pm or 9:00am – 5:00pm workdays. As a result, the transit system experiences particularly high peak hour loads and routine delays due to congestion and lack of capacity on the on-street section of the Transitway. To address this, Ottawa is currently replacing the central portion of the Transitway with the light-rail Confederation line that will travel in a tunnel under downtown Ottawa and is projected to open in 2018.

The stations along the Transitway are located at a variety of key destinations. Bayshore, St. Laurent and Place d’Orléans stations serve regional shopping malls. Tunney’s Pasture station is located in the midst of a major federal government office complex. Riverside station is located inside a hospital. The Train and Fallowfield stations interface with VIA intercity passenger rail service. Campus station serves the University of Ottawa and Baseline station serves Algonquin College. Many stations such as Westboro have significant residential densities nearby. While earlier stations tended to have Transit-Adjacent Development, more recently Ottawa has made concerted efforts to create Transit-Oriented Development and even Transit-Integrated Development around its new and existing Transitway stations.



### **3.4. Key Informant Semi-Structured Interviews**

The original research consisted of a series of semi-structured interviews conducted with key informants in both Winnipeg and Ottawa. This style of interview offered the opportunity to generate primary data from professionals in the fields of transit, planning, and development. The people selected for interviews were from three groups: transit officials, city planners, and property developers involved in TODs. The individuals in each of the three groups are all significantly involved in BRT or related developments in Winnipeg or Ottawa and had a great deal of expertise, insights, and observation to share from their personal experience working in the field. However, key informants from different groups each approached the topic of rapid transit through a different lens. This was important to the overall research as it represented a broad variety of viewpoints on the key issues. Incorporating a diversity of perspectives is important in order to ensure that the findings of this research offer insight on how to achieve the goals of all these groups.

#### **3.4.1. Process**

The interview process was similar to that used by Vicky Reaney (2011) in her MDP research on *Supporting Transit-Oriented Development along the Southwest Rapid Transit Corridor in Winnipeg: Recommendations for Station Area Planning* (Reaney, 2011, p.8). Initial interviewees were identified in consultation with the researcher's advisor based on their qualifications, experiences, and positions that provided them with experiential knowledge deemed useful and relevant to this research. The range of participants selected ensured both representation of differing viewpoints and a high quality of the input the participants were likely to provide. As discussion took place with these key informants, additional persons of interest were identified and interviewed. Using a semi-structured approach enabled the researcher and the interviewee to examine key points of the issue together and allowed the researcher to gain insight into the conflicting and multi-faceted perspectives of informants on this subject. The interview schedule is included as Appendix B.

Prior to commencing each interview, the researcher explained the nature of the research and the context of the project to the interviewees. Interviewees were provided with informed consent forms to sign and participants were advised of their right to withdrawal from the process at any time. The interviewees were advised that the interviews would be recorded with a digital audio recorder. This enabled the interviewer to

focus on the conversation and on the non-verbal body language of the interviewee that may be insightful in addition to the words being spoken. The audio recorder allowed for the extraction of exact quotes that captured specific details that were important or interesting in the final analysis. There were a total of eleven interviews conducted, two with informants from Ottawa, and nine with informants from Winnipeg. The interviews all ranged in length from 55 to 90 minutes, with an average length of about 70 minutes. Each interview concluded naturally when the researcher was satisfied with the questions asked and the informant was satisfied with the information shared.

#### **3.4.2. With transit officials**

The transit officials interviewed included both current and former employees of Winnipeg Transit, as well as a former employee of OC Transpo in Ottawa. These informants provided important perspectives on ensuring that rapid transit infrastructure provides transportation value and is operationally effective. In addition to these primary characteristics, the transit officials stressed the importance of choosing a route that can have the maximum positive benefit on the overall fabric of the city and an impetus to spur development if implemented properly. Their direct expertise with the operational requirements of rapid transit is invaluable to creating a well-functioning, useful system. There were a total of three transit officials interviewed, on their experience in transit planning and service delivery at Winnipeg Transit and OC Transpo, as well as on their experience in private consulting firms.

#### **3.4.3. With city planners**

City planners were interviewed in order to provide insight into the interrelationship between rapid transit infrastructure and overall city development. They have a strong appreciation for the capacity of transit infrastructure to be a city-building tool with the ability to help shape future development in more walkable and sustainable forms. The planners interviewed were chosen because they all have experience with TOD in Winnipeg or Ottawa. A total of four planners were interviewed, regarding their experience at the City of Winnipeg, private consulting firms in Winnipeg and Ottawa, and teaching at the University of Manitoba. Despite this diversity of experience, they all valued the importance of making the best possible decisions on infrastructure investments.

#### **3.4.4. With developers**

Developers involved in TODs were the most distinct subset of interviewees. The developers interviewed were actively involved in projects considered TODs in the former Fort Rouge Yards along the first phase of Winnipeg's Southwest Transitway. They are less interested in the technical details of rapid transit than in how people will use it in its ultimate configuration. Developers in Winnipeg are still evaluating the benefits that proximity to rapid transit brings in terms of desirability. They are in many ways the most important informants in this research from a TOD perspective because they are the ones who actually make the decisions of where and how to build new developments. The developers are ultimately governed by market forces and will respond accordingly to those fiscal realities. There were a total of four developers interviewed on their experience working for companies involved in TODs in Winnipeg.

#### **3.5. Stakeholders Not Interviewed**

There are groups of rapid transit stakeholders in Winnipeg that were not interviewed as part of this research. These groups include, among others, transit riders' associations, environmental organizations, active transportation advocates, disability advocates, social service providers, Winnipeg Transit drivers, and regular transit riders. The perspectives of these stakeholders are all important and would likely have incorporated additional viewpoints into the interview process. However, it was deemed to be beyond the scope of this research to conduct interviews of non-professional stakeholders. The planners identified as key informants have a professional duty to represent the wide-ranging views of the public at large. Therefore, the views of additional stakeholder groups were addressed indirectly through a professional planning lens.

In selecting only professional informants, the researcher avoided potential biases. Interviewing only some non-professional groups but not others would have been problematic in terms of the viewpoints selected for inclusion. Additionally, many non-professional stakeholders may have a bias towards what will benefit their personal transportation needs, rather than taking a big-picture view of the entire city. Local viewpoints are critical when evaluating a particular transit route, but have the potential to narrow the focus too much for the purposes of this research.

### **3.6. Media Analysis**

In addition to the interviews conducted with key informants, an analysis of media articles was undertaken. The purpose of the media analysis was to compare and contrast the key themes identified by the informants with the themes that were most covered by the media in recent years. This is important because it is a summary of the issues of most concern or importance to the public relating to rapid transit. Fifty-two media articles were analyzed, spanning the time period from April 2010 to October 2016. Articles were found through an extensive Google online search and came from a number of private and public sources, including the Winnipeg Free Press, Winnipeg Sun, Metro Winnipeg, CBC, CTV, Global, The Manitoban, The Uniter, and independent blogs.

### **3.7. Summary**

After obtaining ethics approval from the University of Manitoba Fort Garry Campus Joint Faculty Research Ethics Board, key informants were identified in collaboration with the research advisor in Fall 2015. Semi-structured interviews were conducted with key informants in both Winnipeg and Ottawa. The individuals selected for interviews were from transit authorities, city planners, and property developers involved in TODs. The objective of the interviews was to obtain insight from these stakeholders on how they perceive BRT corridors have the ability to generate TOD, and what factors in route selection need to be considered to maximize the potential benefits of the investments in transit infrastructure. The data collected is presented, summarized, and analyzed in section *4 Interview Results*.

## **4. Interview Results**

### **4.1. Introduction**

This chapter presents the results of the semi-structured interviews with key informants as described in section 3.4. The results are summarized by theme in section 4.2. Each theme encompasses the key points and relevant quotes stated by the informants. The media analysis both corroborated and contrasted with the themes in order to triangulate the data obtained from the informant interviews. The results of the media analysis are summarized in section 4.3.

### **4.2. Summary of Findings**

The results of the key informant interviews were coded according to themes identified from the literature review and confirmed by the researcher over the course of conducting the interviews. These nine themes are:

1. Transportation value
2. Corridor-specific and site-specific context
3. Transit operations
4. Ridership potential
5. Long-term city-building goals
6. TOD-supportive infrastructure
7. Location desirability and market demand for TOD
8. Zoning and regulation supporting TOD
9. Feasibility of land redevelopment

The first five themes relate to the physical environment and the transit service. The final four themes describe factors affecting transit-oriented development. An additional theme emerged during the coding process. This theme, entitled Mode Choice, relates to the differences between bus rapid transit (BRT) and light-rail transit (LRT) and how those differences affect development and routing considerations.

#### **4.2.1. Transportation Value**

Transportation value is a theme that considers how well a proposed new BRT route succeeds in moving people. It considers whether the route offers an advantage over existing transportation infrastructure such as the existing on-street bus routes and parallel roadways. More importantly, it considers whether a route serves destinations to which people want to go. In order to provide transportation value, it must offer connectivity to such places as community services, educational institutions, entertainment venues, food stores, major medical care, major open spaces, and retail (Anderson & Ellis, 2014). Because every transit trip begins and ends with at least a little bit of walking, the transportation value of a transit route depends significantly on the pedestrian access around each stop or station. At the same time, rapid transit routes must be reasonably direct and take the shortest reasonable path in order to provide a travel time that is comparable with driving or other modes over that same distance.

##### ***All Informants***

All informants mentioned the importance of a BRT route providing transportation value. At least two informants mentioned the importance of rapid transit service being reliable, with buses arriving at regular, frequent frequencies so that trips don't need to be planned in advance. In addition, significant transportation value is provided by ensuring that travel times are consistently reliable. A dedicated transitway may only decrease the travel time for transit along a corridor from 30 minutes to 25 minutes, and this five minute saving may not be seen as particularly significant. However, if the former on-street service was prone to delays from congestion, so that once a week the trip took 45 minutes, then the time savings for how long the trip reliably takes is actually 20 minutes, a significant savings for both passengers and the transit agency. Transportation value was also described as incorporating the constructability of the network, that is, the overall feasibility of physical engineering considerations and its ability to easily link up with existing transportation infrastructure. This includes identifying potential synergies with other infrastructure that may be in need of replacement, such as the Louise Bridge.

##### ***Winnipeg Transit Officials***

Transit officials tended to focus on transportation value as one of, if not the most important factor in selecting a BRT route. They see transportation of all forms as a demand driven by the needs of people to have mobility. Transportation doesn't exist for its own purpose but rather to serve these mobility needs. Transit officials see the ability to provide

this transportation value as a critical factor in selecting a BRT route. While it doesn't trump other factors, it is important that any route under serious consideration start by providing transportation value. "Whatever corridor is chosen, it has to have some transportation value. I recognize that there are city-building objectives as well, and they're important, but neither one should be done at the exclusion of the other" (Transit Official 2). Ultimately transit officials promoted the idea of ensuring that all routes provide transportation value, and then going beyond that to incorporate multiple other factors as well.

### ***Winnipeg Planners***

Planners tended to emphasize the transportation value of incorporating BRT as one component of a multimodal transportation system. They valued the benefits of bringing different modes together in corridors, so that transit serves the destinations people want to travel to all along an existing corridor and provides transportation benefits to more than just people at either end. One planner appreciated the flexible nature of BRT in that it doesn't require the entire network to be grade-separated. On-street operations, preferably in dedicated transit lanes, are well-suited for the downtown in particular. This allows transit service to be in proximity to destinations and contributes to creating "complete streets" that have continuous streetfront activity. "It's as much about urban design and placemaking as it is about development potential" (Planner 2). Providing increased transportation value to these existing developments allows for more synergies and concentration of pedestrian activity than routing a BRT line down a deserted rail corridor. This was also seen as making new TODs more attractive because of their proximity to areas of existing desirability, rather than trying to build new developments from the ground up.

### ***Winnipeg Developers***

Even developers see BRT as connecting communities and providing increased transportation value along corridors foremost before development-specific considerations. Well-connected communities and locations will naturally be conducive to development occurring nearby. If an arterial roadway like Pembina Highway is chronically congested, then building a parallel transitway provides travel time improvements to both transit riders and drivers, ultimately improving the transportation capacity of the corridor for users of all modes. This will make development sites along the corridor more desirable because prospective residents can travel more quickly and have multiple modes available to them, whether they use transit often or only occasionally.

#### **4.2.2. Corridor-Specific and Site-Specific Context**

A theme reoccurring throughout the research on BRT is that it is flexible and adaptable to different situations. This can be seen in the multiple approaches taken in the examples described in section 2.7 *Transit Route Evaluation Factors and Processes*. The infrastructure generally described as “bus rapid transit” ranges from transit priority measures in mixed traffic to fully grade-separated systems that offer many of the same features as rail-based transit lines. There are often variations within the same city or even along a single transit corridor. Therefore, this theme encompasses the many different ways in which a BRT route should be determined based on local conditions, local knowledge, and local objectives. One of the hallmarks of BRT is its flexibility, and taking a one-size-fits-all approach does not maximize this flexibility and the benefits of the rapid transit infrastructure. Therefore, determining BRT routing by necessity depends upon the context of specific corridors and sites.

##### ***All Informants***

Unlike the other themes identified, the context-specific factors discussed with key informants were exactly that – ‘it depends on the location’. All informants mentioned specific examples of BRT routes and TOD in Winnipeg and other cities that they felt positively or negatively about. In many cases, different priorities were suggested for different corridors. The Eastern corridor between downtown and Transcona is different both in built form and in travel needs than the line proposed to travel north from downtown along Main Street. The former will pass through major redevelopment sites and underutilized industrial land and will need to serve longer-distance trips, while the latter will travel past continuous existing development built up to the street and a need for more local service and shorter trips. The alignment selected depends upon the characteristics of that corridor.

##### ***Winnipeg Planners***

The decision between on-street and off-street alignments was also seen as a corridor-specific decision. This surfaced from questions posed about whether informants saw any difference between the centre median alignment in Pembina Highway that was quickly dismissed in preliminary route studies for the Southwest Transitway, and the centre median or other on-street alignment option on Portage Avenue that is the most likely scenario for building the Western Transitway. One planner believed the Pembina Highway median alignment was dismissed for political reasons, not engineering reasons, because



politicians didn't want pushback from drivers for losing a travel lane. Another planner asserted that Portage Avenue is a fundamentally different corridor from Pembina which necessitates different rapid transit routing choices. Portage has eight travel lanes to Pembina's six and is not subject to the same level of traffic congestion. Pembina Highway experiences particularly high congestion during peak hours, from intersection delay at major cross-streets, and has a number of chokepoints at the Midtown Bridge, Osborne Junction (commonly referred to as 'Confusion Corner'), the Jubilee Underpass, and the Bishop Grandin Overpass. At each of these locations, there are no alternate traffic routes in proximity, unlike Portage Avenue which has more of a grid of parallel routes, such as Ellice, St. Matthews, and Ness avenues. This makes Portage more reliable for on-street rapid transit operations and also provides more alternatives for vehicular traffic to take an alternate route if vehicle lanes are converted to transit lanes. Perhaps most importantly, unlike Pembina Highway, Portage Avenue has no parallel rail or transmission corridors nearby to provide a convenient alternative rapid transit route. Three planners saw no realistic western routing except for within the existing right-of-way of Portage Avenue.

### ***Winnipeg Developers***

Developers stated that TOD is always site-specific. At this point, TOD is a new enough concept in Winnipeg that the types of developments that will be most successful are still being determined. The "big, sexy, Vancouver type of development" (Developer 3) that flourishes in some cities is not feasible for most locations in Winnipeg. More modest low-rise or mid-rise residential or employment nodes are likely to be more successful. Two developers stressed that not every station location needs to have mixed-use TOD, or some may happen more slowly than others. A station such as Plaza Drive on the second phase of the Southwest Transitway has the large Sugar Beet Lands major redevelopment site immediately to the west, but it is on the other side of railway tracks, and only a fraction of the overall site is within the 400 metre walkshed of the transit station. Targeting some TOD closest to the station makes sense, but it requires a safe and direct pedestrian connection across the tracks. The western two-thirds of the site is planned to be developed, but it is too far away from the transit for that to be of much benefit, and cannot be considered to be transit-oriented. A similar situation occurs with the Parker lands TOD site that is directly across the CN mainline from significant commercial development, but residents cannot safely or legally cross the busy railway tracks to access it. Without additional pedestrian

infrastructure, residents will have to drive to access grocery stores and other retail despite being very close as the crow flies.

### ***Ottawa Informants***

As a starting point, two informants stated that rapid transit routes should be built in locations where there are available linear corridors. The early part of Ottawa's Transitway routing decisions in the late 1970s and early 1980s followed routes that had been reserved for proposed freeways in the 1950s and 1960s but were no longer needed for that purpose due to shifting attitudes on urban transportation infrastructure. Former or existing railway right-of ways were used in many areas. In some cases, the BRT routes run on-street along the Sir John A. Macdonald Parkway or in reserved lanes along the Queensway. Two informants stated that building rapid transit routes where land is readily available and most advantageous to build is a good place to start. These routes are typically more cost-effective to build, especially with lower costs for land acquisition and demolition compared with trying to create a new route through a more built-up area. It is also less politically controversial to work within pre-existing corridors. Construction considerations such as the impacts to existing residents, environmental concerns, heritage considerations, and ease of constructability are all factors to consider.

### **4.2.3. Transit Operations**

The theme of *Transit Operations* was identified by multiple researchers in section 2.7 *Transit Route Evaluation Factors and Processes*. This theme incorporates factors including the frequency of service, flexibility of service, transit performance, and existing transit travel time in a corridor. Transit operations encompasses all the aspects that a transit agency (in this case Winnipeg Transit) measures when evaluating its service and making decisions on whether to expand or reallocate resources in order to serve its ridership more effectively. Transit operations are an important factor to consider when determining new rapid transit routes. Building transit infrastructure requires considerable investment and cannot be justified on the part of the transit agency unless there is some benefit to their operations. The first phase of the Southwest Transitway serves 13 different routes, as shown in Figure 2. When this section of transitway opened, it improved service for many riders while making transit service worse for some riders. Overall, the operational reliability of the transit service improved significantly by moving buses away from congested chokepoints.



Figure 2: Current Southwest Transitway Route Network (Winnipeg Transit) (City of Winnipeg, n.d. b)

Operational benefits may include decreased travel time, increased reliability in travel times, increased capacity, more efficient routing, or more efficient transfer requirements. These are all improvements that contribute to making transit more effective for existing riders and more attractive to occasional or choice riders, helping to strengthen transit's role as part of the transportation options of the city. It is important to note that historically, transit agencies were often internally focused, making decisions for operational reasons that didn't benefit their ridership. Operational considerations should always be aligned to consider what riders need and to improve their experience. Transit agencies are shifting towards a more user-focussed approach and the customer's needs are being given increasing importance.

### ***Winnipeg Transit Officials***

Not surprisingly, transit officials have a strong understanding of the importance of selecting routes that enhance transit operations. They cited a number of aspects, including the availability of sufficient right-of-way width, the operating speed of buses, the reliability of travel times, integration with active transportation modes, and the ability to include park-and-ride and kiss-and-ride facilities. In terms of route decisions for the Eastern Transitway, both transit officials valued the proposed South Point Douglas alignment's ability to serve all major downtown destinations, rather than the other proposed alignment through North St. Boniface that would likely preclude those buses from traveling on Main Street north of Portage Avenue. One transit official appreciated the advantages of the Hydro corridor alignment currently under construction and chosen over the Letellier alignment for the second phase of the Southwest Transitway. The Letellier alignment would have had eleven level crossings, with the transitway, a street, and the rail line all intersecting at the same point. The Hydro alignment will have just five level crossings, and only two of these include a rail line. Less conflict points with cross traffic is safer, and also allows buses to travel at higher operating speeds and experience less delay from cross-streets. Even though the Hydro alignment is a kilometre longer, it will still have a quicker travel time than the Letellier alignment.

### ***Winnipeg Planners***

One planner said that any rapid transit corridor must meet the operational requirements of Winnipeg Transit. "There's no use in designing a transit corridor if it's not functional or doesn't work properly" (Planner 1). It should be a transit corridor first, and a development corridor second. The critical point in terms of transit operations is that a rapid

transit corridor can and should improve the reliability of transit service. This is just as important or even more so than improving the speed of transit service. Operational improvements to the reliability of transit service require separating buses from vehicular congestion. Off-street alignments such as the ‘dogleg’ chosen for the Southwest Transitway provide this separation well. On-street alignments have more conflict points with turning vehicles and are still subject to delays at signalized intersections, as it is not possible to provide every bus with signal priority at major intersections. On-street median alignments require riders to cross multiple lanes of a busy street. Routes should be chosen that are compatible with accommodating and interfacing with active transportation, as all transit trips have a pedestrian component.

### ***Developers***

Transit operations is a less important theme for developers. One developer stated that it is important for rapid transit to provide an operational benefit greater than that of on-street express buses to be a worthwhile investment. Any operational improvement that results in increased ridership or a higher value placed on proximity to transit is advantageous for developers. Improved transit operations should result in more favourable economics for TOD projects. Ultimately, however, one developer stated “it doesn’t matter where the bus route goes. It’s where the hub goes” (Developer 1). Developers are concerned much more with station locations than with the routes between the stations or the operational characteristics along those routes.

### ***Ottawa Informants***

Ottawa was cited as a good example for building the Transitway in a manner that functions very well for transit operations along dedicated, separated corridors. However, it was noted by one informant that this also has downsides. In many cases, riders have to walk over pedestrian overpasses and/or through parking lots to access the developments near the transit stations. Although this doesn’t make good sense from a TOD perspective, it can be difficult to do better because there is typically no ‘silver bullet’ that maximizes both transit operations and development considerations. Balancing the two factors is often the best approach. Ottawa has also modified station spacing in order to provide operational benefits. The Lycée Claudel and Smythe stations east of downtown are two smaller stations that replaced the original plan for one larger station in between the two. By using a two-station approach, OC Transpo was able to eliminate the need for a local feeder route

because they established Transitway stations within the walkshed distance of the key developments in the area.

#### **4.2.4. Ridership Potential**

*Ridership* is a theme identified by all the researchers in section 2.7 *Transit Route Evaluation Factors and Processes*. At its most basic level, ridership is a reflection of the number of people that currently use a transit service and those that can be expected to do so in the future. The literature review also considers factors such as rider experience and transfers that affect the quality of a person's trip. This is important, since people with no viable alternative will use transit regardless of the quality of the service. However, choice riders will make their decision on whether to take transit based largely on the comfort, safety, and reliability of their transit trip. The volume of ridership that will be served by a new rapid transit line is a critical consideration in the route chosen. Government investments are most easily justifiable when they are able to bring the greatest benefit to the greatest number of people. Rapid transit projects are often lauded as a way to increase ridership so that there will be a modal shift from cars to transit, easing congestion delays for all travellers.

##### ***Winnipeg Transit Officials***

One transit official sees a disparity between the justification for new road projects compared with transit projects. While the increased traffic generated from widened roads is *not* desirable, conversely transit projects are politically dependant upon achieving ridership *growth*, as opposed to merely improving the service for existing riders. The target market of people living in mature neighbourhoods is more likely to use transit than those in new suburbs, but routes in proximity to greenfield sites have more potential for increased development and ridership from TODs. For an individual corridor, both transit officials recommend starting with an analysis of the origins and destinations of peoples' trips. Choosing routes that serve two-way traffic, such as the Southwest Transitway between downtown and the University of Manitoba, is advantageous because there are major destinations at both ends. This means that many people travel in both directions all day and make better use of the bus capacity instead of having most people travel to downtown in the morning, and home at night while buses in the opposite directions are largely empty. This can be called "development-oriented transit (DOT)" (Transit Official 1), where transit connects the DOTs of development that already exist. One transit official stated that to

attract ridership, it is particularly important to provide transit service that takes people close to where they work. Most people are willing to walk a short distance between where they live and the closest transit stop, but are much more sensitive to longer walks from a transit stop to their workplace or other daily destination.

### ***Winnipeg Planners***

Planners discussed the importance of building transit that serves the most people, not only based on existing ridership, but based on perceived future ridership. If a station is located in a particular area, it will bring in a certain amount of new ridership from that area. “There’s a symbiotic relationship between TOD and transit quality of service” (Planner 1). Well-designed and desirable TOD is seen as the most likely way a new rapid transit line is going to increase ridership. Ridership is also distributed differently along different corridors, and some is more easily captured than others. One planner gave the example of Main Street and McPhillips Street, which are both major north-south arterials in North Winnipeg with significant development along their lengths. Main Street has a lot more people living directly on or adjacent to the street due to the smaller-scale development that fronts the street and creates a walkable pedestrian environment. In contrast, McPhillips Street has a lot of auto-oriented commercial development, and residential areas are behind that, a five-minute walk through surface parking lots. Therefore Main Street has more existing and potential ridership to draw from. It was also mentioned by a planner that there are many people in Winnipeg who no longer commute to the centre of the city as employment nodes are increasingly decentralized. While planners value placing an emphasis on downtown as a focal point for development as well as transit, two planners mentioned the need to create a transit system that balances a focus on the centre of the city while also providing service for people to travel between suburbs.

### ***Winnipeg Developers***

For developers, the most important aspect of ridership is that people need to use transit infrastructure in order to make TODs viable. One developer felt that transit needs to be effectively promoted to help people see the benefits not only of riding transit but of living in proximity to quality transit service. “You can’t just build it and they will come” (Developer 1). Currently, prospective buyers for residential units in TODs in Winnipeg are not likely to give up their car just because they moved to a more transit-friendly locale, the way they might in a larger city such as Toronto. Residents may like the proximity to transit, and use transit more, but as long as they still own a car they continue to want units built

with parking spaces. Developers were optimistic that people will gradually value transit more, and be willing to pay a premium to live in TODs. One developer sees transit that is attractive to choice riders as an important factor in the viability of TOD, since these potential riders are the ones with the means to invest in these projects. Transit that only serves captive riders with low incomes will not be able to support TOD if the ridership cannot afford to live in the new developments.

#### **4.2.5. Long-Term City-Building Goals**

The theme of long-term city-building goals comes directly from Robert Cervero's work in *The Transit Metropolis*. He describes a 'transit metropolis' as a city "where enough travelers opt for transit riding, by virtue of the workable transit-land use nexus, to place a region on a sustainable course" (Cervero, 1998, p. 4). This interface between good transit and good development creates synergies between them, as well as an increase in the value placed on both these attributes. This is important, because Cervero states that transit is currently not a very respected form of travel in much of the developed world, and a city built to prioritize the flow of cars does a poor job at prioritizing the flow of people and the creation of pedestrian-friendly streetscapes and other public places. The theme of long-term city-building goals is somewhat abstract because there is no universal approach that works in every city. Rather, there are general principles of building transit infrastructure that serves the development patterns of a city, and of building development that is well-served by the transit patterns of a city. It may take years or decades for appreciable changes to occur in some areas, but positive change has the potential to create a virtuous cycle of successful planning and development. The Urban Structure map from *OurWinnipeg* shown in Figure 3 identifies the major redevelopment sites that are prime candidates for infill development. Many of these sites are located in proximity to existing, under construction, or planned rapid transit lines. Building transit infrastructure has potential to spur these sites to be redeveloped in a more transit-oriented form than traditional suburban development.

#### ***Winnipeg Transit Officials***

A transit official stated that there is a disparity between the goals of different transportation projects. Road projects never desire a growth in traffic volumes, although expanding road capacity invariably induces traffic growth. Conversely, transit infrastructure projects are politically dependant upon their ability to achieve ridership growth and are often held to a higher standard in terms of the cost-benefit they provide.



## URBAN STRUCTURE

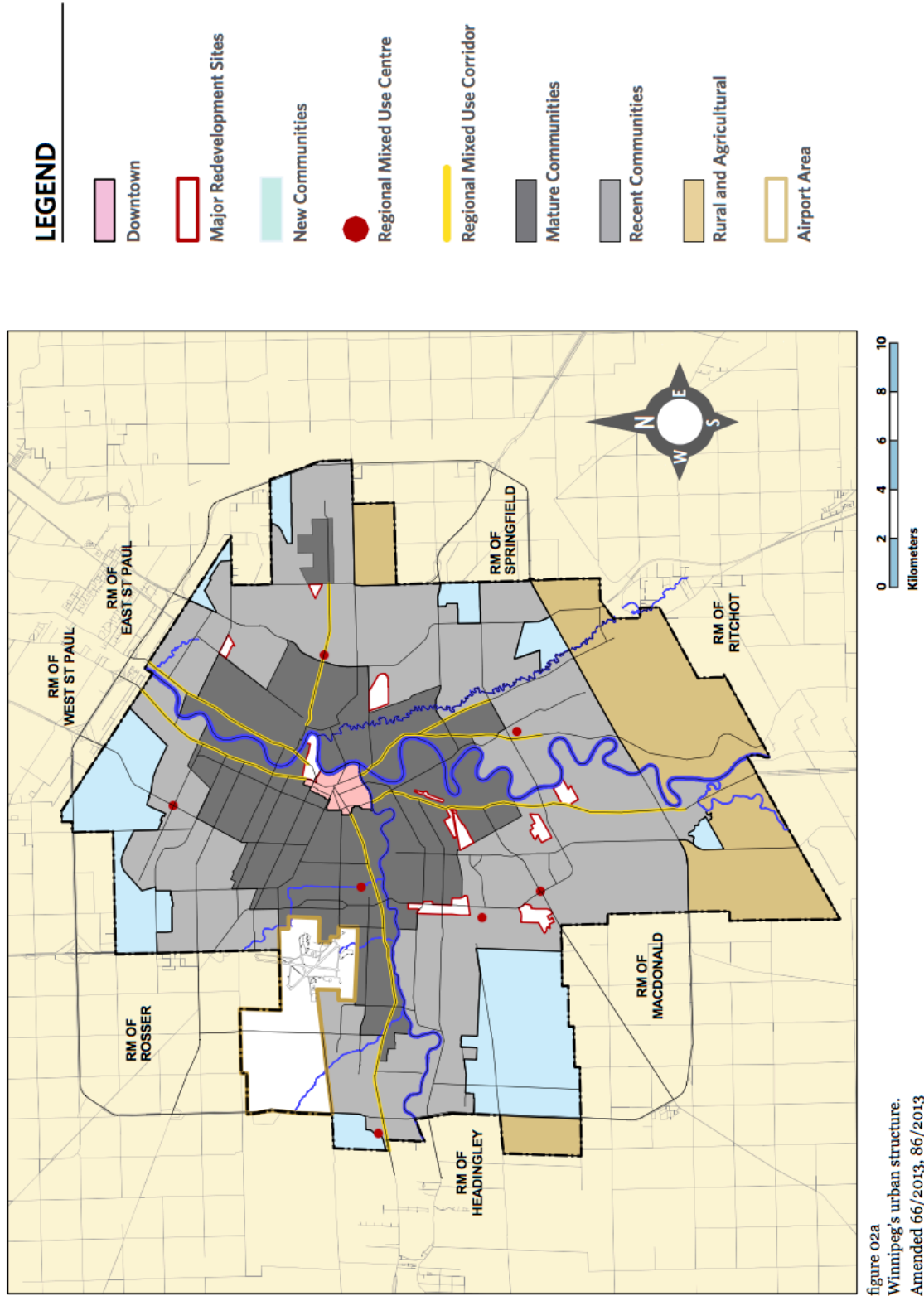


Figure 3: Urban Structure and Major Redevelopment Areas (OurWinnipeg) (City of Winnipeg, 2011a)

When selecting future rapid transit routes, there are opportunities to pick the purpose rapid transit will primarily serve in Winnipeg: either providing better accessibility between suburbs and downtown, or promoting redevelopment of existing mature neighbourhoods. It is often not possible to maximize both aspects, and there is a trade-off between providing better transportation service and greater city-building potential, with no right answer as to how to balance the two considerations. One transit official stated that transit infrastructure has to provide improvements in reliability for riders as well as be a tool to take advantage of infill development opportunities. This balance is difficult to achieve because “a lot of land-use planners only look at intensification and don’t worry about what the transportation value is” (Transit Official 2). To maximize TOD potential, the City of Winnipeg also needs to make hard decisions to restrict suburban development. This is perceived to be difficult because suburban greenfield development often has a lower up-front cost to the city and is a more reliable supply of land. Infill development already faces additional challenges in terms of assembling land and overcoming opposition at public hearings. A transit official cited Ottawa as having done a good job at coordinating their overall transportation planning to maximize the use of transit within a multimodal context, aided in part by policies implemented by the Ontario provincial government. Ottawa has also made transit improvements as well as managing parking in a way that provides a disincentive to driving.

### ***Winnipeg Planners***

A planner stated that it is important to look at the desire lines for transportation in Winnipeg, and not just build rapid transit lines along rail corridors that happen to be available. When built carefully, transit infrastructure can be a strong catalyst for enabling more mixed-use dense infill. It has to be done properly, with development shaped by transit and not merely adjacent to transit. There is a lot of density being built around Winnipeg in marginal locations where there are cheap parcels of leftover land. Many of these locations force residents to walk a significant distance to access retail or transit service. Some residential developments have the density in the right location but the form isn’t oriented either to transit service or to nearby streets. It is seen as important to have development built in the right way. Proper interface of developments with their surroundings requires care in the execution. It can be difficult to put in place the infrastructure required to enable good TOD, because political decision makers need to be convinced with evidence of future

benefits, “and you’ve got to compete with other city infrastructure priorities for development that *might* happen”. Tracking the economic benefits of good development is important to demonstrate its value, and to show that infill sites are a more sustainable form of development. If new residential units aren’t built in the Fort Rouge Yards, then they will be built much further away in places like Ridgewood South or Waverley West, where residents are more likely to drive. For this reason, the choice of rapid transit routes that enable the redevelopment of major sites is very important. For the Eastern Transitway,

“South Point Douglas is located literally right next door to downtown and is what I would consider a potential transformative project for the city. The redevelopment potential there is significant, [...] the transformative potential of that alignment is orders of magnitude higher than North St. Boniface. So if you’re looking at the corridor just as a rapid transit corridor [the two routes are] roughly similar, from a city-building perspective it’s night and day.” Where other cities have made major changes to their urban form, such as Portland, Oregon, it’s been because “they’ve put the political will behind selecting the corridors, getting them built, making sure that where the corridors go there are redevelopment opportunities, and doing the things necessary to making [sic] redevelopment opportunities happen” (Planner 1).

In order to have comprehensive and effective transit planning, one planner stated that the planning process needs to identify locations for TOD at the same time as station locations are being selected. *OurWinnipeg* identifies a number of development and redevelopment sites, but it doesn’t set timelines for development. Two planners would like the master planning document to set out more prescriptive priorities for the order in which sites should be developed, and to give priority to more desirable types of development over others. The status quo of development happening in the easiest locations is not necessarily best for the city overall. Similarly, it is important not to fall into the trap of believing that Winnipeg is a car-centric city and that it will never change appreciably. Having the political courage to designate some neighbourhoods as models to demonstrate that there are better, more sustainable ways to live and develop is important in order to achieve a shift in mindset. Public education about the economic realities and hidden costs of ‘free’ parking and roads is critical to demonstrate the actual costs to the city of different models of development. The recent debate about implementing growth fees is an important first step for Winnipeg in that regard.

### ***Winnipeg Developers***

Developers expressed the difficulties of building TOD in Winnipeg where it’s not ingrained in the collective psyche that it’s okay to take public transit and that it’s actually

beneficial to do so. The culture regards successful people as driving their own cars, unlike in denser urban areas. One developer sees it as being crucial to transform the way in which Winnipeggers get around, with rapid transit being the opportunity to do that. In order to achieve such a transformation, visionary guidance at the city level is needed. Looking at the big picture of what rapid transit investments are trying to accomplish is important. Ensuring that transit infrastructure has TOD built around it is critical to spur increased density and to avoid enabling further urban sprawl as a result of rapid transit lines. Two developers stated that rapid transit infrastructure is a significant investment that will be used for a long time, and requires a comprehensive cost-benefit analysis to ensure the city can expect a good return on its investment. They both stressed that it's important to invest enough money in transit infrastructure to ensure that it's built right from the start and that it achieves its full potential. The most cost-effective option for Winnipeg is likely not the cheapest option.

### ***Ottawa Informants***

Both informants from Ottawa shared lessons that have been learned when selecting transit routes. The best route in terms of transportation value may require expropriating a row of homes or businesses. The value of that route may not be worth the community disruption and pain, especially when the political reality is that construction needs to happen quickly. Instead, picking the second-best route for the transit corridor may allow construction to happen more quickly, more easily, and with far less disruption. In most cases, this is a trade-off worth making because decision-makers should “think broadly about the social benefits of the facility, not just the straight costs” (Ottawa Informant 1). Original planning for the Ottawa Transitway in the 1980s focused on providing connectivity between nodes, like “pearls on a necklace” (Ottawa Informant 2). Development along the Transitway was less successful than initially hoped, with stations surrounded by parking lots for shopping centres and park-and-rides. Some commercial development took place around stations but relatively little residential development. Nowadays, planning has shifted so that factors in corridor selection include smart growth and travel speed along an entire corridor. This can be seen with the plans for LeBreton Flats along the new Confederation LRT line. The winning redevelopment plan proposes building a new arena for the Ottawa Senators NHL team halfway between two stations. The idea behind this is that it encourages more pedestrian traffic through the surrounding neighbourhood and spurs continuous development rather than the arena being an ‘island’ unto itself. This is seen by an informant as a major shortcoming of Ottawa’s existing NHL

arena, the Canadian Tire Centre in suburban Kanata. Despite being served by express buses along the Transitway and reserved lanes on the Queensway, the arena is a standalone destination with almost no development around it. With transit planning, both informants stated that it's important to focus not just on getting people to drive less, but to focus on improving the quality of life in a city and integrating communities in a way that allows people to work, shop, eat, and play within their own neighbourhoods.

#### **4.2.6. TOD-Supportive Infrastructure**

This theme considers the importance of physical infrastructure that supports the establishment of TOD around rapid transit stations. In her research in Los Angeles, Loukaitou-Sideris (2010) identified attributes that support this theme. Three of her key attributes to encourage and enable TODs along rapid transit lines are to “pre-plan for TODs” (p. 65), to “develop strong public/private partnerships” (p. 65), and to “achieve better coordination among different public entities” (p. 65). Nelson et. al. also conclude that significant cooperation between developers and transit agencies is required for successful developments.

These factors, among others, can be summarized as highlighting the importance of proactive and open dialogue between those responsible for developing transit infrastructure, those responsible for other civic infrastructure, and developers interested in pursuing TOD projects. All three components need to come together for TOD, and the importance of civic infrastructure and utilities such as water, sewer, power, and roads is often understated. Some locations that appear to be prime candidates for TOD require significant capital investment in order to support higher densities. In some cases, the cost may be too great to justify the return. In other circumstances, it may require the city to coordinate the infrastructure upgrades of an entire district, with developer payback over time. Regardless of who pays for infrastructure upgrades, development can only occur if the appropriate capacity is put in place. It is almost always cheaper to plan for and undertake any required upgrades earlier in the development of an area. Therefore infrastructure needs to be considered along with the transit planning process.

#### ***Winnipeg Transit Officials***

Both transit officials spoke about the redevelopment potential around regional mixed-use nodes. One of them pointed out that the existing transit terminals at major shopping centres were built over a decade or so in conjunction with redevelopment plans at

each of the shopping centres. When the timing is right to combine projects, they can happen more easily. Conversely, new rapid transit infrastructure can also spur redevelopment. A transitway routing through South Point Douglas has the potential to be the redevelopment catalyst for the entire area. Both transit officials stated that stations should be sited in areas that have the infrastructure to accommodate adjacent development. Greenfield sites have fewer complications with utilities and other infrastructure because there is nothing existing to work around. Redevelopment sites in existing built-up areas can often be less expensive to service and are generally preferable as long as the proper foundation is in place infrastructure-wise. Where existing infrastructure needs to be removed and then replaced, realigned, or upgraded, it quickly becomes more expensive than building new on a greenfield site.

### ***Winnipeg Planners***

One planner stated that TOD requires both transit infrastructure and utilities and other servicing infrastructure. Merely building a rapid transit line and zoning land around it for TOD isn't enough for development to happen if there are other infrastructure investments needed. Sometimes there are infrastructure issues that developers don't have the financial capacity to deal with. For the Fort Rouge Yards TOD site along the first phase of the Southwest Transitway, the existing combined sewer district was at capacity. Winnipeg Transit and the City of Winnipeg planning department discussed combining land drainage requirements for the transitway with increased drainage capacity for the existing neighbourhood as well as potential new TOD that was planned for the Fort Rouge Yards site. The incremental cost of larger sized pipes was lessened because they were built like that to start, and the funds were recouped by developer paybacks. "That land drainage was one of the key factors in the TOD actually being built. If the land drainage was not there, the development would not have happened because it would have been too much for the developer to take on, and very quickly it wouldn't have made economic sense" (Planner 1). The return on the City's upfront investment in drainage is seen as much better for infill TOD projects than the return is on similar infrastructure investments for suburban car-focused projects such as the Waverley Underpass. Another point raised by a planner is that larger redevelopment sites make more sense when infrastructure investments are required. Running a couple kilometres of new pipe may make sense for a 50-100 acre site but not a 5-10 acre site. The Pointe Hébert redevelopment site in North St. Boniface is only seeing single-family homes constructed instead of multi-family buildings for just this reason.

Despite being close to downtown, the Red River, and a potential route of the Eastern Transitway, the existing infrastructure capacity is limited and building anything higher than four-story walkups would require major upgrades to regional water infrastructure. The overall site is not large enough to justify such expenditure on the part of either a developer or the city.

### ***Winnipeg Developers***

Three developers were frustrated with the lack of communication and collaboration from the city at early stages of transitway planning in the past. They stressed that they don't wish to see any confidential information divulged but that incorporating developer feedback into the preliminary route design could result in designs that increase the development potential of TOD sites. Certain areas may be more desirable for development than others, or closer to existing development, and would therefore be more likely to be built with higher densities. In a similar vein, certain areas may have more infrastructure capacity than others, which allows for more density to be built prior to needing an expensive capacity upgrade. Sites that are closer to existing water and sewer mains are also cheaper to service. One developer stated that existing hubs such as Polo Park are likely to see redevelopment and increased densities as a result of rapid transit infrastructure. Siting stations in proximity to sites that are easy to redevelop, such as surface parking lots or empty retail spaces, will encourage that redevelopment to happen more easily. These areas typically have existing infrastructure already in place or in close proximity and with additional capacity.

#### **4.2.7. Location Desirability and Market Demand for TOD**

This theme considers the economic factors at play around TODs. Land in proximity to rapid transit stations is seen as being more valuable, although the degree of this benefit is still largely unknown in Winnipeg. Being close to rapid transit may not be enough to make a parcel of land economically desirable to a developer if the location desirability or market demand are not sufficient to justify its development. Location desirability is defined as the difference in the value of land in different areas of Winnipeg. For example, land in Elmwood is valued at much less than similar land in River Heights due to a variety of socioeconomic factors. Land along major arterial corridors tends to have a higher value throughout the city. Market demand is defined as the city-wide demand for a certain type of development, such as high-rise condominiums or Class A office space. With slow but

steady population and economic growth in Winnipeg, there is typically only so much new development that can be absorbed by the marketplace every year. This theme is important because the feasibility of new TODs is dependant on the underlying economic conditions. One of the key conclusions that Nelson et. al. (2015) drew from their study of TOD along BRT lines in Eugene, Oregon, is that if the market for development generally is not strong, then a transit agency or municipality needs to specifically target and facilitate development around transit stations with some kind of TOD program. Cooperation between developers and transit agencies is necessary to ensure successful developments. Choosing routes that travel near areas that are more economically feasible to develop will enable more TOD to be constructed more quickly.

### ***Winnipeg Transit Officials***

A transit official stated that it is important to ensure that TOD sites are close to existing development, although it doesn't necessarily need to be immediately adjacent. There is a fixed demand for residential development in Winnipeg. This development should be directed to locations and be built in forms that provide the best net present value to the city to help ensure ongoing financial sustainability. Both transit officials noted that new transit infrastructure doesn't change land desirability overnight and any benefits to intensification of land uses tend to lag behind the transit investments. Paying back the capital costs of transit investments through increased development doesn't start immediately. With correct planning that creates necessary conditions for intensification, including land that is market-ready and development-ready, intensification will happen over time. An example given is what occurred with the Graham Avenue Transit Mall. In 1994 and 1995, the existing four-lane street was narrowed to two lanes and restricted to transit vehicles and bicycles only over a five-block stretch. It took almost a decade for development to follow the transit infrastructure, but since 2004, many major downtown developments have been built or are under construction along Graham Avenue, including the MTS Centre, Manitoba Hydro Place, and True North Square. All of these projects have considered access to frequent transit service as an important component of their site selection criteria. Future development plans can also influence the nature of transit infrastructure that is built. As with the Jubilee station on the Southwest Transitway, a basic station may be built initially, with a more elaborate station constructed once development begins to occur.



### ***Winnipeg Planners***

Two planners agreed that successful TOD requires sites that have not just good potential for development, but good visibility. Visibility along major arterial roadways is important both to attract potential residents and to make commercial development visible to customers. The dogleg route of the Southwest Transitway through the Hydro corridor is seen to be largely invisible, which may hinder the development potential along the route. The development ramifications of route choices and station locations need to be considered right from the beginning of the planning process for a new rapid transit route. To encourage and enable successful TOD, stations also need to be located close to the land with the highest potential intensity of development. Osborne Station on the Southwest Transitway is in a high-visibility location but does not have any ready sites for multi-family residential development nearby. A planner also stated that it is important to look at TOD location decisions through the lens of a developer to assess location desirability. South Point Douglas could be a desirable riverfront neighbourhood with large-scale redevelopment. Sites adjacent to the St. Boniface Industrial Area downwind of the mushroom farm would probably be less desirable. Ultimately, it was stressed that “density is a resource...you have to realize the underlying market fundamentals” (Planner 1). Drawing a line on a map or simply building a new transit corridor isn’t enough to create development. Although demand has been increasing in recent years, there is only so much demand for new development, especially dense multi-family development. If this denser residential development is all focused in one area, there will be less demand for development in other areas where it is also desired.

### ***Winnipeg Developers***

The desirability and demand for TOD is an important factor for developers. They typically build multi-family residential developments near commercial areas. This is in part because high-density developments typically attract younger adults without children and older adults whose children have already moved out. Both of these groups value proximity to commercial amenities more than proximity to schools or playgrounds, the way families with children tend to. While multi-family residential with commercial developments make for good TOD and make good sense from a developer’s perspective, there is concern from two developers that it is hard to create these areas from scratch on a greenfield site. A ‘chicken-and-egg’ scenario results because “you need the multi-family to justify the commercial but you need the commercial to get the multi-family” (Developer 1). When

developing a new suburban area, typically single-family residential is built first, then commercial, and finally multi-family residential. While this approach works well in large traditional subdivisions such as Sage Creek, there is more risk to take on when building in smaller sites with less visibility, such as the Fort Rouge Yards, which are off the beaten track from major arterials. When building in infill areas, developers are also trying to build something at an appropriate price point that will fit with the existing neighbourhood. In the case of the Fort Rouge Yards, that means trying to build residential units that can be sold at or under \$200,000. As Winnipeggers get used to the advantages of living in proximity to rapid transit service, there will likely be increased desirability and momentum, and future developments may include higher-end units.

There are some identified redevelopment locations that developers are interested in independently of their proximity to rapid transit. The former Sugar Beet Lands near Pembina Highway and Bishop Grandin Boulevard are a good example of a site that is close to major arterials, existing commercial amenities, and the University of Manitoba. This was stated by two developers as being a desirable location that is conducive to building density. The site's proximity to a future rapid transit station at Plaza Drive is a major benefit, but ultimately not seen as being as important to the feasibility of the development as the other factors identified. "You could build it [the density] without the transit, but you couldn't build the density without the location" (Developer 1). The fact that the development site is across a railway line and largely outside the standard walkshed of the transit station, results in one developer looking at this site planning to provide a standard 1.5 parking stalls per residential unit, instead of reducing the parking supply as is often the case with TODs. All things being equal, proximity to rapid transit service is seen as a benefit, but transit itself is not seen as sufficient to tip the balance for a particular site from undesirable to desirable. A desirable TOD site has to be in or near a location where people want to live with or without transit. The premium value placed on TODs is primarily due to the fact that they are brand-new buildings in well-located infill sites in established, desirable neighbourhoods. However, it was stated by two developers that proximity to transit brings the benefit of spurring additional density for a development near a transit station. This additional density can be enough to improve the economics on a TOD site so that developers can build more units on a parcel of land, or consider building highrise apartments, which the economics of the local market often make unprofitable. One developer stated that they build plenty of apartments in other cities where there are better returns on them, but relatively few in

Winnipeg. A developer also said that clustering developments together and close to existing development and travel corridors increases the visibility and viability of projects. Winnipeg is not a high-growth market, so patience is required to stage development accordingly to match demand and ensure that there is enough demand in an area to absorb new construction. Building in areas where there is a strong likelihood of change occurring will result in redevelopment pressures on under-utilized sites, such as one-story buildings fronting on major arterials. Increasing the number of people traveling along a corridor, by putting rapid transit on or adjacent to arterial roadways, increases the development potential of that corridor.

#### ***Ottawa Informants***

An example was given by an informant of a scenario in Ottawa shortly before the Transitway in that city first opened in 1983 when the economy was performing poorly. A developer was unable to get financing for a highrise condominium building at a site near the Herdman station until the Regional Government of Ottawa-Carleton explained the nature of the Transitway infrastructure to the bank. Fortunately, this bank understood the value of proximity to transit, the developer was approved for financing for two buildings instead of one, and at a lower interest rate than his initial request. The Ottawa development community then began to take notice of the financial advantages of TOD.

#### **4.2.8. Zoning and Regulation Supporting TOD**

In separate studies, both Loukaitou-Sideris (2010) in Los Angeles and Nelson et. al. (2015) in Eugene, Oregon identified factors enabling successful TOD along rapid transit lines that relate to the need for legislative support. This support may take the form of zoning, by-laws, secondary plans, or other regulations that facilitate and encourage development around the stations of a rapid transit line. Previous research considers it especially important to have zoning and regulations that support development and redevelopment that is denser, more mixed-use, and with less parking than would be the case without the presence of a rapid transit line. While transit infrastructure is a key ingredient in the construction of TOD, it cannot happen without the necessary zoning that allows this type of development to occur. There must also be a regulatory framework in place that makes is straightforward and expedient for developers to obtain approvals and permits for the construction of desirable development.

### ***Winnipeg Transit Officials***

Both transit officials see a need to plan for TOD at a neighbourhood level with tools such as secondary plans. High-level citywide planning is important, but it is not enough on its own. “*OurWinnipeg* is a great high-level planning document, but it lacks the fine-grain tools to put the plan into effect” (Transit Official 1). It was proposed by one transit official that secondary planning should occur in concert with the route planning for a new rapid transit corridor. This will allow the identification of areas where intensification of development is likely to occur, and where it can be focused through the routing of the rapid transit line and station placement. The next step identified is to put in place zoning around the transit station that will attract intensification and growth in those areas. Allowing increased height limits, lower or no minimum parking requirements, or simply removing the need to go through time-consuming and potentially contentious rezoning applications are all means of leveraging the infrastructure investment to attract private investment from developers.

### ***Winnipeg Planners***

One planner stated that in many cases, rezoning for denser, mixed-use development is also consistent with the designation of regional mixed-use corridors in *OurWinnipeg*. Portage Avenue and Main Street are planned to be both rapid transit corridors and regional mixed-use corridors, so planning for both goals should be undertaken simultaneously. A planner suggested that this could be accomplished by establishing some minimum requirements for height and density, as has been incorporated in TOD areas identified in the Corydon-Osborne Area Plan. Another planner suggested to use form-based zoning that is more about urban design guidelines than traditional land-use planning. Rezoning an entire arterial corridor at once may not be the best approach. It was suggested that an incremental approach to increased density may be more appropriate, where efforts are concentrated around existing nodes of density to build off success and create more synergies rather than spreading the ‘resource’ of density too thinly to be effective in creating a dynamic, complete neighbourhood. Despite the complications of working with many redevelopment sites, Winnipeg is seen by one planner as being in the middle of the pack in the North American context. Unlike many other metropolitan areas, particularly in the United States, the City of Winnipeg has a single municipal government which also owns Winnipeg Transit. This structure makes it easier to streamline regulatory approval and coordinate between transit and land-use planning.

### ***Winnipeg Developers***

Three developers felt that new zoning and regulations are an important component of what will make more TOD possible. Currently it's much easier and less risky to build more suburban greenfield developments than infill projects in established neighbourhoods. With infill, it is slower and more onerous to obtain the necessary permits, especially when rezoning is required. Infill development often encounters NIMBY (Not In My Back Yard) opposition even when it conforms with existing zoning. "Any developer doing a TOD project in Winnipeg right now is putting their neck out. They're taking a risk on behalf of the City and the City could do a lot more to accommodate that" (Developer 4). It was suggested by one developer that the City of Winnipeg could make the approval process easier for developers looking to build TODs by fast-tracking approvals for developments in designated TOD zones that meet 90% of the criteria in the *City of Winnipeg Transit-Oriented Development Handbook* (City of Winnipeg, 2007).

Another major challenge with building TODs that a developer stated is that there are some unusual legal challenges with some of the redevelopment sites identified. The former Southwood Golf Course land is owned by the University of Manitoba and developers can only get a 99-year lease, not clear title to the land, which limits interest. In North St. Boniface, there is clear title, but the secondary plan for the area limits density to 55 units per acre due to infrastructure capacity constraints, preventing high-rise developments. The transitways themselves are not considered public roads, so minor but critical things like Manitoba Hydro right of ways don't automatically apply the same way as they do along public roadways. This caused some complications in bringing power to the TOD developments under construction in the former Fort Rouge Yards.

#### **4.2.9. Feasibility of Land Redevelopment**

The feasibility of land redevelopment is a theme that is based on both the *Development Potential* and *Environment* themes identified in the literature review. It refers to the ease of developing specific parcels of land that may be greenfield sites, brownfield sites, or simply sites that are currently underutilized compared to their highest possible use. Different sites may have different challenges to redevelopment. Brownfield sites may have environmental contamination from waste storage or industrial pollution from previous uses. Infill sites may need rezoning or face opposition from the community. The size of parcels available is also important, as developers may need to build larger or smaller developments

based on the economics of their proposed projects. The feasibility of land redevelopment is an important theme because proximity to a new rapid transit route typically increases the value and desirability of adjacent land. However, this is not necessarily enough of an impetus in and of itself to result in redevelopment.

### ***Winnipeg Transit Officials***

Both transit officials stated that in terms of redevelopment, dramatic growth will only be achieved in greenfield sites because the property requirements are simpler and there is no existing infrastructure to relocate. Infill sites generally take longer to develop, and there's not much chance of intensifying land use in the middle of existing single-family homes. What the transit officials both saw as most important was ensuring that the routes chosen for transit corridors don't restrict the potential for future development. An example of this is for the future Eastern Transitway, where the route option through North St. Boniface is next to a lot of empty land in and near Whittier Park. Although there is no development there, there is much value in preserving that land as greenspace, particularly given the historical significance of the site to Métis people. Conversely, the South Point Douglas alignment has a few residential pockets that need to be integrated into any redevelopment plan, but there is a lot of vacant and underutilized industrial land. Even if redevelopment takes time, from a land-use perspective South Point Douglas has a much larger potential for redevelopment.

### ***Winnipeg Planners***

The development of CentrePort is seen by one planner as providing a more appropriate location for industrial development than inner city sites such as South Point Douglas. Two planners recommend taking a longer-term view when looking at TOD potential in transit corridors. Along a desirable transit corridor, land values are expected to gradually rise. "At a certain point, the value of the land exceeds the value of the building, and at that point you can argue that the redevelopment potential is higher than what's there now" (Planner 1). Where the existing uses are low-rise auto-oriented commercial buildings with plenty of surface parking, such as along Pembina Highway, there appears to be a lot of redevelopment potential. However, it may take a couple of decades for the land value to increase enough for this to occur, particularly since the existing businesses are profitable in their current state.

### ***Winnipeg Developers***

A developer questioned the feasibility of creating successful new TODs in some of the major redevelopment sites identified in *Our Winnipeg*. An example mentioned was South Point Douglas, which has a mixture of industrial and other uses and is classified as a major redevelopment site. The Eastern Transitway may be routed through South Point Douglas and is expected to provide the impetus for major new redevelopment efforts. Although this area is close to downtown, the Red River, and the increasingly popular Exchange District, two developers feel that “it’s going to be a tough area to turn around” (Developer 2) since many people have preconceived notions on what the good neighbourhoods and bad neighbourhoods are in Winnipeg. This perception gap reduces the selling price buyers are willing to pay compared to similar developments in other neighbourhoods, and may be enough to tip the scales so that projects in infill locations are not profitable for developers. This problem is particularly acute in larger areas like South Point Douglas because redevelopment is trying to create a whole new neighbourhood as opposed to redeveloping a smaller parcel of land adjacent to existing desirable developments. Contaminated former industrial sites and fragmented land ownership also contribute to the challenge of redeveloping South Point Douglas.

### ***Ottawa Informants***

Both informants from Ottawa discussed the environmental challenges of developing land in some locations. The areas around the Lees and Hurdman Transitway stations east of downtown Ottawa near the Rideau River are particularly notable. The Hurdman station was built on top of a landfill that was closed in the 1960s. The station itself was built with a thick rubber membrane and methane detection systems. However, large swaths of adjacent land remain undeveloped over thirty years after the Transitway opened. Further development would require extensive cleanup. One station over, the Lees station was built in proximity to a former coal gasification plant. Apartments adjacent to the station that were built on that site experienced black coal tar residue oozing out around the foundation while construction was still underway. Significant and expensive cleanup was required at that point, and the buildings may not have been constructed in the first place if the extent of the required remediation was better understood.

#### **4.2.10. Additional Theme: Mode Choice**

Another significant theme that emerged from the key informant interviews is the choice of mode for rapid transit routes. This theme was not part of the original nine themes identified in the coding process, but was added as it became apparent that it was a recurring theme mentioned by a number of informants. Winnipeg has chosen to use BRT in dedicated transitways, much like Ottawa. However, Ottawa is currently undertaking a conversion of the central section of the Transitway system from BRT to LRT. Expected to open in 2018, it will be called the Confederation Line and will move from surface streets to a tunnel through downtown Ottawa. In this case, the physical route for the rapid transit line is largely already chosen, with only a few small modifications. The decision to upgrade from one mode to another comes from a cost-benefit analysis based on increasing ridership and capacity constraints on the downtown street network, which experiences significant and regular delays at peak hours. This raises the question of whether Winnipeg may need to follow Ottawa's lead.

##### ***Winnipeg Transit Officials***

Both transit officials stressed that BRT is able to offer almost all the aspects of a rapid transit system that LRT does, such as fare collection systems, level boarding, intelligent transportation systems, and branding, but at a lower cost. Although many people feel that rail transit is 'sexier' and attracts more ridership, the transit officials stated that there are only two key operational differences between the modes. The first is the vehicles used, with rubber tires versus steel wheels and tracks (although the Montréal Métro uses rubber tires). Individual trains are also longer and have a higher capacity than buses, even articulated ones. The second and primary difference is the service plan. Rail-based transit is confined to its runningway, resulting in a constrained and focused service plan that requires transfers for trips away from a transit line. BRT provides a great deal more flexibility, with routes able to use transitways where possible, but also able to travel on-street. When the routes are well-planned, this reduces the need to transfer and is seen as the better overall service plan.

##### ***Winnipeg Planners***

A planner said that downtown Winnipeg has more street capacity than Ottawa, with Portage Avenue and Graham Avenue providing two parallel routes for transit buses with greater total capacity than the one-way pair of Albert Street and Slater Street in Ottawa.



Therefore the downtown on-street bus network in Winnipeg functions better in terms of transit operations.

### ***Ottawa Informants***

Both informants from Ottawa stated that the choice to use BRT in Ottawa demonstrated the value of eliminating the need to transfer. Buses operate on-street in residential areas and then travel express along the Transitway, and back on-street downtown. This provides most riders with a one-seat trip to major destinations. Once the Confederation LRT line replaces the central stretch of the Transitway, riders will have to transfer between bus and train. This is the first major modal conversion in Canada with rail service replacing existing BRT infrastructure as the backbone of a rapid transit system, and will be watched closely to examine peoples' response to the change. One informant sees the need to transfer as fairly straightforward for riders heading inbound to downtown because they will be transferring from bus to a more frequent rail service, so wait times won't be long. However, for outbound trips, the transfer from rail to a less frequent bus service may result in long waits and increased overall travel times for many riders.

### **4.3. Media Analysis**

In addition to the interviews conducted with key informants, an analysis of media articles was undertaken. The purpose of the media analysis was to compare and contrast the key themes identified by the informants with the themes that were most covered by the media in recent years. This is important because the messaging in the media comprises what the majority of the public knows about rapid transit in Winnipeg. It also reflects the issues of most concern or importance to the public on this issue. Fifty-two media articles were analyzed, spanning the time period from April 2010 to October 2016. This included the opening of the first phase of the Southwest Transitway in April 2012 as well as the debates, route selection, and approval of the second phase of the Southwest Transitway beginning in 2013.

For the media analysis, articles were selected using an online Google search with the key words 'Winnipeg' and 'bus rapid transit' as well as 'Winnipeg' and 'rapid transit'. Sources included newspapers, print articles from television media, university publications, and personal blogs. Only articles that were available at no charge were included. Media outlets such as the Winnipeg Free Press have more coverage for paid subscribers that was not included. A particularly high frequency of rapid transit-related articles were published

in Metro Winnipeg. This is likely because the newspaper is distributed at no charge on Winnipeg Transit buses and transit riders are a significant segment of their readership. While the selection of articles incorporated into the media analysis is by no means exhaustive, it is a representative sample of the coverage of different rapid transit-related themes by a cross-section of Winnipeg media. It should be noted that a transit official informant stated that there were some key points in route decision-making that were absent from media coverage. This was due to incomplete communication on the part of Winnipeg Transit and the City of Winnipeg. It was suggested that it would be beneficial to improve the public communications in future transit planning processes.

Source	Cost	P3 & Financing	Whether to Build?	Mode Choice	Site-Specific Issues	Route Choice	Corridor Opening	Election & Referendum
Metro Winnipeg	9	4	6	6	7	4	5	3
Winnipeg Sun	1		1					
Winnipeg Free Press	1					1		
CBC	1	1	1	1		2		
CTV	2	1	2			1		
Global	4	1	1	1	1	2	1	
The Uniter				1				
The Manitoban								1
Dallas Hansen				1				
Manitoba Forward				1				
<b>Total</b>	<b>18</b>	<b>7</b>	<b>11</b>	<b>11</b>	<b>8</b>	<b>10</b>	<b>6</b>	<b>4</b>

**Table 2: Frequency of Articles by Code and Source in Media Analysis**

### ***Financial Cost***

The most significant and recurring theme in the media analysis was the financial cost of rapid transit infrastructure. This was discussed in eighteen articles, along with an additional eleven articles covering the question of whether Winnipeg should be building rapid transit at all. This is not surprising as the capital cost to build a new transitway corridor is in the hundreds of millions of dollars and represents a major project for the City

of Winnipeg. Additionally, cost estimates tend to be revised throughout the planning process and fluctuate as the plan is refined and new information becomes available. The public is naturally concerned that the city is receiving good value for money when it comes to large infrastructure investments. Councillor Jeff Browaty's statement in 2014 is reflective of the sceptical sentiment people harbour as to whether rapid transit should be one of Winnipeg's infrastructure priorities: "As nice as rapid transit phase two would be to construct for Winnipeggers, and it's a big city thing, I honestly don't think it is our best value for almost \$600 million worth of capital infrastructure" (Pontanilla, 2014c).

The financial costs of building rapid transit are only one aspect affecting public support of whether to build it or not. Plenary Roads Winnipeg was the consortium chosen to construct the second phase of the Southwest Transitway, and they identified \$120 million in savings based on some changes to the preliminary design. A public poll found that "despite the savings, the price tag can still make it difficult for Winnipeggers to get behind the project" (Ricci, 2016). This poll and others have found a distinct split with a majority of younger Winnipeggers supportive of fast-tracking BRT construction, and a majority of older Winnipeggers opposed. Overall, citizens have been roughly split in their support.

### ***Mode Choice***

A second ongoing debate that is reflected in the media analysis is on mode choice. A detailed analysis of different vehicles or runningways is beyond the scope of this research. However, comparisons between different modes are unavoidable in the media coverage of rapid transit in Winnipeg and were discussed in eleven articles in the media analysis. There are consistent calls from politicians and the public to build new rapid transit routes as light-rail transit (LRT) instead of bus rapid transit (BRT). Although all the BRT routes are built with geometry that can be converted to LRT in the future, many people would prefer to spend the additional money for LRT up front.

Proponents of LRT believe that it is a higher quality of transit service that is necessary to foster a more widespread culture of transit use in Winnipeg, particularly in attracting people who do not currently ride public transit. They also argue that it is worth investing more money up front to build the transit system that Winnipeg is likely to need in the long run. Proponents of BRT believe that it is a more cost-effective choice that will allow Winnipeg to build a more extensive network. They also appreciate the flexible routing options that minimize the need to transfer to complete a trip. Dave Wardrop, the

former director of Winnipeg Transit, stated that “Both BRT and LRT are the right tool for the right job, and the right tool for Winnipeg right now is BRT.” (Pontanilla, 2014b)

### ***Site-Specific and Route-Specific Issues***

The final major theme arising from the media analysis relates to site-specific and route-specific issues. Eight articles discussed site-specific issues, particularly related to land acquisition, and the choices between different routes were discussed in ten articles. Almost any route selected for new transit infrastructure will require some land acquisition and will have some effect on existing neighbourhoods and residents. For the second phase of the Southwest Transitway, the Parker Lands were the most contentious area. Much of the site was used for railway operations decades ago, and *OurWinnipeg* designates the area as a major redevelopment site. After decades sitting vacant, many local residents use the Parker Lands as greenspace and want the site to remain undeveloped. Others see the redevelopment of the Parker Lands as an opportunity to build a transit-oriented neighbourhood in a good infill location. Councillor Russ Wyatt proposed the creation of a “Transit Development Agency [that] would function in a similar manner to CentreVenture, and be tasked with increasing ridership and encouraging density along the rapid transit route.” (Pontanilla, 2014a)

Overall, the media analysis confirmed many of the themes raised in the key informant interviews. The financial considerations of rapid transit investments were much more prevalent in media coverage, whereas the informants interviewed were more concerned with the technical considerations and finer detail required to implement rapid transit as effectively as possible.

## **4.4. Summary**

The Interview Results chapter presents a summary of the information obtained from the researcher’s interviews with key informants. Informants came from three groups: transit officials, city planners, and developers. There were nine themes identified for factors that they felt should influence the selection of new rapid transit routes in Winnipeg. The first five themes related to the physical environment and the transit service. The final four themes described factors affecting TOD. An additional theme emerged during the coding process related to different modes of rapid transit, and yet another theme on financial cost emerged from the media analysis.

For each theme, the key points from informants were presented, organized by each of the three different groups of informants. The most critical information was collected along with a selection of pertinent quotes. In many cases, there was notable overlap between the different informants. Different groups of informants tended to emphasize the importance of certain themes over others, but all agreed that incorporating a wide variety of factors into rapid transit decision-making was important in order to ensure that the process was as comprehensive as possible. The conclusions drawn from this research and a set of recommended factors for evaluating BRT routes in Winnipeg are explained in section 5 *Synthesis of Results*.

## **5. Synthesis of Results**

### **5.1. Introduction**

This chapter synthesizes the results of the research outlined in the preceding chapter. Section 5.2 describes how the results address the research questions originally posed. Sections 5.3 to 5.7 analyze each of the recommended eleven factors in detail, and present them as a list of questions that can be considered when assessing proposed new rapid transit routes in Winnipeg. Section 5.8 examines the implications these recommendations have for professional planners, and lays out the role that planners have in implementing them in the process of determining and evaluating routes for rapid transit. Section 5.9 describes the five key conclusions derived from this research. Finally, directions for further study are suggested in order to continue to expand the scope of the research.

### **5.2. Addressing the Research Questions**

The research questions described in section 1.3 are answered in the following sections. First are the lessons learned from Ottawa, followed by the factors identified in the research for evaluating rapid transit routes in Winnipeg.

#### **5.2.1. Lessons from bus rapid transit routes in Ottawa**

The first research question posed was: *What factors and considerations have other cities used to determine the routing of bus rapid transit corridors, and have these been successful? If so, in what ways?* There were a number of lessons learned that address this question, from interviewing key informants in Ottawa, as well as Winnipeg informants with enough familiarity on rapid transit in Ottawa to comment on the situation in that city.

The City of Ottawa has never established a formal set of qualitative criteria by which to evaluate one proposed rapid transit route against another. However, a number of factors have been historically considered in the overall decision-making process on rapid transit routes in Ottawa. These factors have gradually evolved over the past several decades. In the 1970s and 1980s, routes were primarily selected based on their transportation value, transit operations, and the ease and cost of constructability in available corridors. Development sites near transit stations were identified, but were not considered as an integral part of the overall planning process. More recently, it has been recognized

that good transportation value and transit operations are important, but are not the only factors to be considered.

Considerations around the desirability and feasibility of transit-oriented development along rapid transit lines has become increasingly important in Ottawa. At the same time, the modal choice for rapid transit has shifted to include light-rail lines, dedicated freeway lanes, and on-street operations in addition to the grade-separated busways that were the focus of the early Transitway development. Establishing a diversity of potential modes contributes to the approach whereby the individual context of every route and station must be taken into consideration, instead of a one-size-fits-all method. This encourages a planning process that is more sensitive and inclusive of the travel needs and city-building desires of individual neighbourhoods in proximity to rapid transit lines.

Along with a more context-sensitive approach to selecting rapid transit routes in Ottawa, there has also been additional consideration of the long-term city-building implications of rapid transit infrastructure. These implications include providing more sustainable transportation options, and helping to focus and shape development in a way that is more dense and reduces the need for residents to drive to access retail and services. However, these big-picture goals are best considered from a full-corridor perspective, not as individual stations in isolation. This means that it is important to strike the right balance between local priorities and citywide goals. Ottawa informants stressed that it is also important to be patient with development. TOD around stations can take decades to be built to its full potential, especially in major redevelopment areas that basically start from scratch. There may also be significant environmental remediation or infrastructure upgrades to these sites that must be completed prior to any development commencing. A realistic, long-term vision of transit-oriented development helps to inform how and where a new rapid transit route should be built. These lessons are as equally applicable to Winnipeg as they are to Ottawa.

### **5.2.2. Factors for bus rapid transit routes in Winnipeg**

The second research question posed was: *What factors should be considered to determine the routes, and to guide the construction, of the rapid transit corridors proposed in OurWinnipeg?* This research has identified eleven factors that address the question. They are based on the themes described in *Chapter 4: Interview Results*. The first ten factors

were determined from each of the ten coded themes from the key informant interviews. The final factor was derived from the media analysis, as summarized in section 4.3.

This research has identified the following eleven factors that should be taken into consideration when evaluating alternatives for, and determining the final routes of, the rapid transit corridors proposed in *OurWinnipeg*:

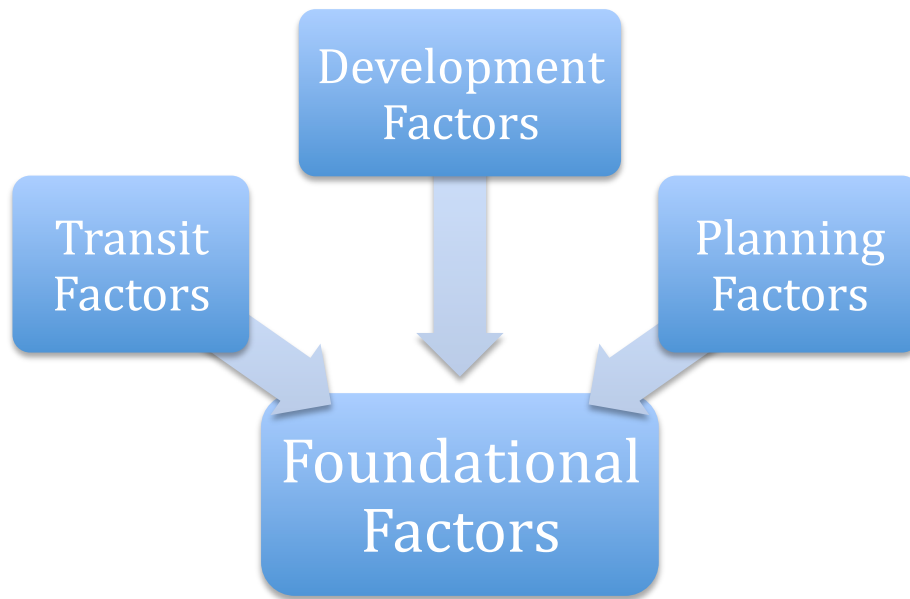
1. The transportation value that a route provides to the citizens of Winnipeg;
2. Whether a route is the best fit for the specific context of a corridor;
3. Whether a route works in concert with transit operations and routing;
4. The potential existing and future ridership that will use a route;
5. Whether a route best supports long-term city-building goals for land use and built form;
6. Whether there is infrastructure in place to support TOD near stations;
7. Whether the locations for TOD are desirable and there is demand for the development;
8. Whether there is zoning and regulation in place to encourage and enable TOD;
9. The feasibility of redeveloping land in proximity to stations;
10. Whether a route is well-suited for the physical requirements and flexible route structure of BRT, and;
11. Whether a route provides good value for the financial investment without compromising its usefulness.

In section 5.3, these factors are further refined. The perspectives obtained from the key informant interviews and the media analysis are critically analyzed and synthesized in order to produce a set of factors recommended for inclusion as part of a framework for future bus rapid transit route decisions in Winnipeg.

### **5.3. Recommended Factors**

The preceding factors are organized into four categories that fit within a common framework. The most critical factors are called ‘foundational factors’. They are the starting point for any route evaluation and are the factors upon which each of the other categories depend. Once it is determined that a route satisfies the two foundational factors, the factors in the other three categories should be applied in turn. These categories of factors are termed ‘transit factors’, ‘development factors’, and ‘planning factors’ and each category depends upon the foundational factors as shown in Figure 4.





**Figure 4: Framework of Recommended BRT Factors**

The recommended factors in each category are laid out below. Each factor is presented as a question based on one of the eleven factors listed in section 5.2.2. The number preceding each question indicates number of the factor on which it is based from the previous list.

***Foundational Factors***

- (1) Does this route serve the transportation needs of the citizens of Winnipeg?
- (5) Will this route work towards long-term city-building goals consistent with *OurWinnipeg*?

***Transit Factors***

- (3) How well does this route serve and enhance the operational requirements of Winnipeg Transit?
- (4) How well will this route serve existing riders and attract new riders?
- (10) How well does this route work as part of a city-wide BRT network and benefit different routes?

***Development Factors***

- (6) Do the areas surrounding the stations have appropriate infrastructure in place to support new development?
- (7) How desirable are the areas around the stations as locations for development?
- (9) Is it feasible and cost-effective to redevelop the areas around the stations?

### ***Planning Factors***

(2) How well does this route fit within and enhance the urban fabric of a corridor?

(11) Is the financial cost of this route commensurate with its expected benefit?

### ***Additional Factor***

There is a fourth development factor that is not part of the recommended framework but is an additional consideration that should be considered later in the process once a route is already selected:

(8) Do the areas around the stations have appropriate zoning in place to enable transit-oriented development?

Evaluating the recommended factors in a way to be able to compare different potential route options against one another is significantly more complex than a simple yes/no answer. Each of the eleven questions for the recommended route selection factors are open-ended and must be answered subjectively in a way that allows the relative merits of different routes to be compared to one another as best as possible. The following sections explain each recommended factor in more detail. The results from the research are summarized and then analyzed in light of the literature review and the researcher's evaluation.

## **5.4. Foundational Factors**

The two recommended foundational factors are the most critical factors for any rapid transit route in Winnipeg. It is recommended that any evaluation begin by assessing how a route satisfies these factors, and only proceed to the evaluation of the other categories of factors if the foundational factors are satisfied.

### **5.4.1. Does this route serve the transportation needs of the citizens of Winnipeg?**

This first foundational factor considers how well a proposed new BRT route succeeds in moving people, and whether the route offers an advantage over existing transportation infrastructure. For a route to serve transportation needs, it must offer connectivity to such places as community services, educational institutions, entertainment venues, food stores, major medical care, major open spaces, and retail (Anderson and Ellis). Many informants mentioned the importance of rapid transit service being reliable, with buses arriving at regular, frequent frequencies so that trips don't need to be planned in advance. In addition, significant transportation value is provided by ensuring that travel

times are consistently reliable. Transportation value was also described as incorporating the constructability of the network, including its ability to easily link with existing transportation infrastructure. Appropriate pedestrian links around transit stations are particularly important because every transit trip begins and ends with at least some walking. Rapid transit routes must also be reasonably direct and take the shortest reasonable path in order to provide travel time for transit trips that is comparable with driving or other modes over that same distance. Routes should be selected that serve the transportation needs of the citizens of Winnipeg.

Ensuring that a rapid transit route serves transportation needs is a foundational factor. As with any transportation infrastructure, a BRT corridor must provide utility for citizens in order to justify its capital and operating costs. A corridor must extend between destinations to which people want to travel, such as downtown, the University of Manitoba, hospitals, and shopping centres. It must also provide transportation value for residential neighbourhoods and other smaller destinations along the route. Because providing transportation value is foundational to the purpose of rapid transit, this is a foundational factor that must be must be satisfied before proceeding any further in the route evaluation process.

#### **5.4.2. Will this route work towards long-term city-building goals consistent with *OurWinnipeg*?**

This second foundational factor is inspired by Robert Cervero's 'transit metropolis', which is a city "where enough travelers opt for transit riding, by virtue of the workable transit-land use nexus, to place a region on a sustainable course" (Cervero 1998 p. 4). This interface between good transit and good development creates synergies between them, as well as an increase in the value placed on both these attributes. This is important, because a city built to prioritize the flow of cars does a poor job at prioritizing the flow of people and the creation of pedestrian-friendly streetscapes and other public places. The theme of long-term city-building in Winnipeg is based on the goals laid out in *OurWinnipeg* and its family of related master planning documents, including *Sustainable Transportation* (City of Winnipeg, 2011c), and the *Transportation Master Plan* (City of Winnipeg, 2011d). As these are living documents, it is expected that the specific goals will evolve over time. Tools such as the *City of Winnipeg Transit-Oriented Development Handbook* (City of Winnipeg, 2007) provide concrete direction consistent with achieving these long-term

goals. A similar handbook based on these route selection factors may need to be developed as well. Transit routes should be selected that further the city's planning goals.

Along with transportation value, city-building goals are the second foundational factor by which to evaluate a rapid transit route. Where transportation value focuses mainly on the present, city-building goals focus on the long term. This factor emphasizes the many planning goals laid out in *OurWinnipeg* that direct planning to help shape Winnipeg as a more sustainable and liveable city. Once a BRT route is built, its alignment will remain constant for decades to come. Therefore, selecting a route that supports long-term planning goals is critical to the evaluation process, and is a foundational factor that must be met before proceeding any further in the process.

## **5.5. Transit Factors**

This category consists of three factors that assess the how well a proposed rapid transit route enhances the overall transit network and service for riders in Winnipeg. They are primarily based on the foundational factor of transportation value.

### **5.5.1. How well does this route serve and enhance the operational requirements of Winnipeg Transit?**

This factor considers whether a particular route will benefit Winnipeg Transit operations including the frequency of service, flexibility of service, transit performance, and existing transit travel time in a corridor. These are all performance measures that Winnipeg Transit considers when evaluating its service and making decisions on whether to expand or reallocate resources in order to serve its ridership more effectively. Justifying a significant capital expense for new transit infrastructure depends on its ability to improve operations with decreased travel time, increased reliability in travel times, increased capacity, more efficient routing, or more efficient transfer requirements. These are all improvements that contribute to making transit more effective for existing riders and more attractive to occasional or choice riders, helping to strengthen transit's role as part of the transportation options of the city. As Winnipeg Transit and other transit systems shift towards a more user-focussed approach, operational considerations should always be aligned to consider what riders need and to improve their riding experience.

Choosing routes that serve Winnipeg Transit's operational requirements is a necessary factor for new rapid transit corridors. It is less critical, although certainly beneficial, for BRT routes to enhance Transit operations outside of the immediate rapid

transit corridor. It is important for new BRT routes to benefit Winnipeg Transit's operations as a whole not for the sake of achieving better performance measures, but for the benefits that this will bring to the transit riders who use the service. Ultimately, this factor is based on the foundational factor of transportation value. Routes that provide good transportation value are likely to benefit transit operations as well.

#### **5.5.2. How well will this route serve existing riders and attract new riders?**

This factor looks at whether a proposed rapid transit route will have people riding it, both because there are already riders there, and because it is predicted that ridership will increase. The literature review identifies aspects such as rider experience and transfers that affect the quality of a person's trip. Improving the comfort, safety, and reliability of transit trips will encourage choice riders to select transit over driving. Informants identified the importance of selecting routes with sufficient volume of all-day two-way traffic to justify a high frequency of service. This makes it easier to secure political buy-in and financial investment. Having enough ridership is also important in order to make transit-oriented developments viable. Developers value rapid transit that is attractive to those choice riders who would be willing to pay a premium to live in TODs. These are the potential buyers who both value the benefit of living in proximity to rapid transit service and have the financial means to purchase new residential units. Rapid transit routes should be chosen that will serve both existing and future ridership.

As stated for the previous factor, the most important part of the three transit factors is how well a rapid transit route serves its ridership. It is beneficial, although not necessary, to achieve an increase in total ridership. What is critical is that any BRT route should provide benefits to its existing riders. With any route change, there will always be some individual riders that find it disadvantageous for their particular needs. This is acceptable provided it is more than balanced by providing better service for the majority of riders. However, care should be taken to ensure that the needs of vulnerable riders (including seniors, people with mobility challenges, and people with low socioeconomic status who are dependant upon transit service for their transportation) are given particular weight and consideration in the evaluation process. Improved transit service for riders is likely to increase ridership on a route even if it takes some time to materialize.

### **5.5.3. How well does this route work as part of a city-wide BRT network and benefit different routes?**

This factor explores whether a rapid transit route is a good fit for the mode of vehicle that will be used on it. In Winnipeg's case, bus rapid transit has been chosen as the mode for rapid transit for the foreseeable future. Nevertheless, the Southwest Transitway has been designed with geometry that can accommodate a potential future conversion to light-rail transit, as Ottawa is currently undertaking with the Confederation Line. Informants noted that downtown Winnipeg has a higher street capacity than Ottawa, and therefore Winnipeg's on-street bus network functions better in terms of transit operations. The primary difference between BRT and LRT is the service plan. Rail-based transit is confined to its runningway, resulting in a constrained and focused service plan that requires transfers for any trips not directly along a transit line. Bus rapid transit provides a great deal more flexibility, with routes able to use both transitways as much as possible, but also able to travel on-street. When the routes are well-planned, this reduces the need to transfer and informants stated it results in a better overall service plan and route network. Therefore, routes must be evaluated on how well they fit into Winnipeg Transit's overall network plans.

This final transit factor relates not to transportation value, but to long-term city-building as its primary foundational factor. It is important that a rapid transit route fit into the overall network plans laid out in the City of Winnipeg's *Sustainable Transportation* and the *Transportation Master Plan*. Given the flexibility of BRT routing and construction, it is not necessary that a route connect directly to other BRT routes or provide benefit beyond its immediate corridor. However, it may be necessary to wait years or even decades for additional rapid transit routes to be built in order to realize a route's full potential.

## **5.6. Development Factors**

There are three factors related to transit-oriented development, as well as one additional factor that is discussed in detail in section 5.6.4 and not included along with the others. All three of these factors are based on the foundational factor of long-term city-building and are less important than the other categories of factors. This is because although TOD occurs around the stations of a rapid transit line, it is not essential to have TOD occur around *every* station. Some stations are built in areas that are simply not conducive to have TOD nearby. This can be because they are located in a hydro

transmission corridor, or because the environmental remediation of potential TOD sites is cost-prohibitive. However, a BRT line without any TOD sites at all does not satisfy the long-term city-building factor. Therefore, these development factors are absolutely necessary for the stations that are well-suited for TOD. Supportive infrastructure, location desirability, and feasibility of development are all necessary factors to have in place for TOD to be built at any given site.

#### **5.6.1. Do the areas around the stations have appropriate infrastructure in place to support new development?**

This factor considers whether there is physical infrastructure and capacity to support new transit-oriented developments around stations. This includes residential and collector streets, emergency services, electrical capacity, telecommunications services, and water and sewer lines. These do not need to be in place at the time of selecting a rapid transit route, but any serious infrastructure shortcomings will need to be addressed prior to the construction of TODs. Upgrading infrastructure or utility capacity at the same time as a rapid transit route is constructed in the vicinity offers potential cost-savings and avoids digging up brand-new infrastructure after a year or two to upgrade capacity. Infrastructure needs to be considered during the transit planning process, based on the recommendations of Loukaitou-Sideris to “pre-plan for TODs”, to “develop strong public/private partnerships”, and to “achieve better coordination among different public entities” (Loukaitou-Sideris 2010). Some locations that appear to be prime candidates for TOD require significant capital investment in order to support higher densities. In some cases, the cost may be too great to justify the return. In other circumstances, it may require the city to coordinate the infrastructure upgrades of an entire district, with developer payback over time. Regardless of who funds infrastructure upgrades, development can only occur if the appropriate capacity is put in place. It is almost always cheaper to plan for and undertake any required upgrades earlier in the development of an area than after the fact. Therefore having, or being able to upgrade, the infrastructure to support new TOD is a factor in selecting a rapid transit route.

#### **5.6.2. How desirable are the areas around the stations as locations for development?**

Desirability of land is a factor that affects the likelihood that development will take place at that site. Potential buyers need to be willing to pay an asking price for a new

condominium or retail space that returns a profit to its developer, otherwise developers will not build that development at that location. Proximity to rapid transit stations generally makes land more valuable, although the degree of this benefit is still unknown in Winnipeg. Being close to rapid transit may not be enough to make a parcel of land economically desirable to a developer if the location desirability or market demand are not sufficient to justify its development. Government incentives may be required to encourage development in certain undesirable areas. If targeted appropriately, incentives will help improve desirability of these areas and spur further development. With slow but steady population and economic growth in Winnipeg, there is typically only so much new development that can be absorbed by the marketplace every year. Choosing routes that travel near areas that are more economically feasible to develop will enable more TOD to be constructed more quickly, based on existing market forces and demand. Where stations are located in less desirable redevelopment areas, developers need to be engaged early in the planning process, and governments need to consider providing incentives to ensure the creation of successful developments that support the rapid transit infrastructure. This can tip the balance to make these areas desirable for development.

#### **5.6.3. Is it feasible and cost-effective to redevelop the areas around the stations?**

This factor is related to the previous two factors, but considers the physical and environmental feasibility of redeveloping parcels of land around transit stations. Greenfield, brownfield, and infill sites each have unique challenges to redevelopment. Greenfield sites may be too far removed from existing services to extend services cost-effectively. Brownfield sites may have environmental contamination from previous uses that has resulted from waste storage or industrial pollution. Infill sites may need rezoning or face opposition from the community. The size of parcels available for redevelopment is also important, as developers may need to build larger or smaller developments based on the economics of their proposed projects. The feasibility of land redevelopment is an important factor for transit route selection because proximity to a new rapid transit route typically increases the value and desirability of adjacent land. However, this is not necessarily enough of an impetus in and of itself to result in redevelopment. Land that is feasible and cost-effective to redevelop will result in development taking place more quickly, while difficult sites may sit empty for years or decades after the construction of a rapid transit route.



#### **5.6.4. Additional factor: Do the areas around the stations have appropriate zoning in place to enable transit-oriented development?**

This factor considers whether the appropriate zoning, by-laws, secondary plans, or other regulations are in place to facilitate and encourage development around the stations of a rapid transit line. Previous research considers it especially important to have zoning and regulations that support development and redevelopment that is denser, more mixed-use, and with less parking than would be the case without the presence of a rapid transit line. While transit infrastructure is a key ingredient in the construction of TOD, it cannot happen without the necessary zoning that allows this type of development to occur. Developers stated that it is considerably slower and more onerous to obtain the necessary permits for infill developments compared with greenfield developments, especially when rezoning is required. It was suggested that the City of Winnipeg could make the approval process easier for developers looking to build TODs by fast-tracking approvals for developments in designated TOD zones that meet 90% of the criteria in the *City of Winnipeg Transit-Oriented Development Handbook*. The City of Winnipeg Charter could also be amended to allow the City to require upgrades to be constructed or reimbursed by developers for simple building permits instead of only for rezoning. This would allow the City to undertake pre-emptive rezoning without missing out on revenue, and would remove some of the legal irritation and uncertainty of rezoning for developers. An incremental approach to increased density may be most appropriate, where efforts are concentrated around existing nodes of density to build off success and create more synergies between them rather than attempting to build high-density along an entire corridor. There must also be a regulatory framework in place that makes it straightforward and expedient for developers to obtain approvals and permits for the construction of development that is deemed most desirable.

Multiple key informants discussed the importance of zoning and regulations as an important final factor influencing transit-oriented development. It is certainly an important aspect affecting the construction of TODs. However, this should not be considered as the same importance as the previous three development factors. In fact, it need not come into play during the initial route evaluation process. Zoning can be considered later in the planning process once a route is actually selected. It is still valuable to begin rezoning processes proactively at that point, perhaps during the construction of the transit infrastructure, to reduce the time needed for construction of TODs once the rapid transit route is complete.

## **5.7. Planning Factors**

This category consists of two factors that assess the how well a proposed rapid transit route enhances the overall planning goals to improve the urban fabric of Winnipeg in a cost-effective manner. They are primarily based on the foundational factor of long-term city-building.

### **5.7.1. How well does this route fit within and enhance the urban fabric of a corridor?**

This factor is based on the theme of making context-specific route decisions. One of the hallmarks of BRT is its flexibility, and this allows for different approaches to be taken to maximize the benefits of the rapid transit infrastructure in different areas. Informants shared specific examples of BRT routes and TOD in Winnipeg and other cities that they felt were more or less successful. In order to enhance the existing urban fabric of a corridor, rather than detract from it, many informants stated that rapid transit routes should be built in locations where there are available linear corridors. These routes are typically more cost-effective to build instead of creating a new route through a built-up area, especially with lower costs for land acquisition and demolition. It is also less politically controversial to work within pre-existing corridors due to construction considerations such as the impacts to existing residents, environmental concerns, heritage considerations, and ease of constructability. It is also preferable to build routes in proximity to existing amenities to allow new nodes of TOD to build upon existing development. When built in appropriate locations, rapid transit routes should enhance the urban fabric of a corridor by promoting redevelopment and increased density in nodes around stations.

This factor is based directly on the foundational factor of long-term city-building. The natural application of that factor to a more immediate and short-term context results in the recommendation of the urban fabric factor. This factor is important from a planning and preservation perspective to seek organic change and natural redevelopment that enhances existing neighbourhoods. Even more important is the effect this factor has on public support and the buy-in from existing residents of the neighbourhoods through which a new rapid transit route is proposed to be built. It is understandable that some minor property acquisition is often required for large infrastructure projects, however a rapid transit route should not require large-scale expropriation of the residents it is purporting to benefit.

### **5.7.2. Is the financial cost of this route commensurate with its expected benefit?**

This factor recognizes that the financial cost of selecting one rapid transit route or another must always be considered. However, this factor is not simply about selecting the cheaper option. The general public is naturally concerned that the city is receiving good value for money when it comes to large infrastructure investments. Consequently, the most significant and recurring theme in the media analysis was the financial cost of rapid transit infrastructure. The capital cost to build a new transitway corridor is in the hundreds of millions of dollars and represents a major capital project for the City of Winnipeg. Therefore, this factor considers the benefit-to-cost of transit infrastructure investments. This is not a simple ratio, but rather a careful assessment of the many long-term benefits good transit can bring to the citizens of Winnipeg. In some cases, it may be justifiable to spend a little bit more upfront to build a more useful and beneficial route. In other cases, it may be possible to choose a significantly cheaper route that delivers almost as much benefit, with the savings applied to construction of the next route. The financial cost should be commensurate with the expected benefit the rapid transit route will provide.

This factor of financial cost is important insofar as the City of Winnipeg has limited funds available for rapid transit capital projects. It is important to ensure that the funds available are able to build as many kilometres of BRT routes and provide as much transportation value to citizens as possible. However, cost-benefit analysis should not be taken too far. The media and politicians often hold transit projects to a higher standard of cost-benefit justification than they do for roadway infrastructure projects. It is not necessary for a transit project to demonstrate a strong cost/benefit ratio if it can be shown to provide a valuable societal good. These benefits are not necessarily captured by traditional economic calculations. Therefore, this factor of financial cost should be considered less important than many others in the route evaluation process.

## **5.8. Implications for Professional Planners**

Professional planners are a vital component of the planning and selection process for rapid transit routes in Winnipeg. The input and perspective that they bring to the evaluation process is a multidisciplinary approach, helping to incorporate a diversity of viewpoints and perspectives. Planners are professionals who represent the interests of the public at large and attempt to reconcile conflicting desires and reach decisions that are a reasonable and fair compromise between different interests. Therefore, planners are

uniquely positioned to ensure that recommendation number five “*Will this route work towards long-term city-building goals consistent with OurWinnipeg?*” is implemented. Professional planners were responsible for the process that created *OurWinnipeg*, and for the ongoing regular updates to this and the City of Winnipeg’s other master planning documents. Planners need to contribute to the route selection process by using their knowledge of City goals, zoning, and by-laws. They can ensure that rapid transit infrastructure and development are able to work together and complement each other. Planners can also assist rapid transit planning by ensuring that there is zoning in place along future rapid transit corridors and around future rapid transit stations that enables and allows TOD to occur. As opportunities arise, they can assist in proactively rezoning properties and ensuring that the City of Winnipeg’s zoning by-laws allow for dense, mixed-use development in the locations where it is desirable.

Professional planners have an additional role to play when it comes to efforts to encourage and make the most of the potential for TOD along a rapid transit line. To be effective in enabling TOD to reach its full potential, planners must work with property developers during the planning process. In many cases, developers may not be in place for redevelopment sites because the planning process begins many years before the transit infrastructure is built and the adjacent sites are desirable for TOD. Planners must therefore represent the interests of future developers during the planning process. They must also look at station locations and redevelopment sites from a developer’s perspective. They need to evaluate the land that is available for development, and locate stations in the appropriate locations to allow TOD to be built in proximity to the stations. In some circumstances, planners may also need to coordinate with different municipal departments or utilities to ensure that the appropriate infrastructure is in place to support new developments. There can often be significant cost savings by upgrading infrastructure properly from the start, rather than waiting until it is needed and either redoing earlier work or working in a more constrained physical environment. Planners can ensure that infrastructure is built right the first time.

## **5.9. Conclusions**

The key findings of this research are summarized in the following five conclusions. First, the selection of any BRT route alignment depends upon a combination of wide-ranging factors. Sections 5.2.2 and 5.3 explain the eleven factors recommended to be taken

into consideration when evaluating alternatives for, and determining the final routes of, the rapid transit corridors proposed in *OurWinnipeg*. While there is no single factor that is more important than the others, there are some factors that depend on others to a certain degree. Overall, there are many potential synergies to be found from finding route solutions that satisfy all the factors identified.

Second, there is almost never one perfect route that satisfies all factors. Balancing and finding compromises among different factors is necessary to achieve the best possible overall outcome. The rapid transit routes ultimately chosen for construction should prioritize addressing each factor reasonably well over addressing some factors very well and other factors poorly. As public infrastructure, rapid transit should be built in such a way that it delivers the maximum benefit to the most people. However, there may be situations where a slightly worse outcome for one factor delivers much better outcomes in other factors. These are likely trade-offs worth making. There may also be opportunities to benefit from the flexible nature of BRT service to delay a piece of a corridor, such as an expensive new bridge, for a few years and build it as a second phase. This may be necessary given political and funding realities, and should be considered if necessary to build the best BRT route in the long run.

Third, many important factors are qualitative or speculative and depend upon subjective judgement for assessment. No qualitative assessment will be perfect, and the quality of the assessment depends upon the qualifications of the professionals performing the assessment as well as their personal and professional judgement. Therefore, a spectrum of knowledgeable stakeholder and professional perspectives should be included in any route evaluation process. There should be input from, among others, transit officials, city planners, developers, transit riders' associations, environmental organizations, active transportation advocates, disability advocates, social service providers, Winnipeg Transit drivers, and regular transit riders.

Fourth, route evaluation must always consider local context and needs. One of the goals of any transit infrastructure project should be to serve the transportation needs of area residents. If these are in opposition to city-wide objectives, then an appropriate balance must be struck. As described in section 5.8 *Implications for Professional Planners*, this is one area where planners have a critical role in negotiating and balancing competing interests. An open and transparent community consultation process is critical to ensure that local residents and stakeholders are genuinely included in the decision-making process.

One of the ways that these stakeholders could influence this process would be to help determine the weighting for each of the different evaluation factors. Their perspectives must be considered even though they may not ultimately have direct input into making the final decision about a rapid transit route.

Fifth and finally, it is important that any process for route evaluation be flexible and continue to evolve. Whether in Ottawa, Winnipeg, or other cities, the knowledge base on BRT and TOD continues to evolve. Winnipeg should learn from local precedents and best practices from other cities. This will allow the process and criteria used for transit route evaluation to be based on the best information available.

#### **5.10. Directions for Further Study**

Rapid transit in Winnipeg has been studied and debated for decades. This is likely to continue in the future. To build on the current research, there are two areas for further study specifically identified below: determining the weighting of different factors, and continuing to study rapid transit and related TOD in Winnipeg.

The current research has identified eleven factors that should be considered when evaluating rapid transit routes in Winnipeg. Each of these factors is important, but no attempt has been made to assign explicit weightings to each of the factors as to how important they should be in an overall evaluation framework. Assigning numerical weightings is difficult because different individuals and different groups of people will always have differences of opinion over which factors are more important than others. It is also difficult to assign numerical weightings to qualitative or speculative factors, which attempts to translate them into quantitative factors. Nevertheless, further study may be able to provide at least some general guidance as to the relative importance of the factors identified. Having a clear framework to help guide route and alignment studies is expected to be of value to all the stakeholders involved in coming to a decision.

A second direction for further research is to continue to study the successes and shortcomings of BRT infrastructure and associated TODs in Winnipeg over the coming years. Only five years have elapsed since the first phase of the Southwest Transitway began service in April 2012. Lessons from Ottawa show that it can take decades for TOD areas to become fully developed, especially in mid-sized cities without particularly strong growth rates. Therefore, Winnipeg still has some time to go before conclusive lessons can be drawn from the existing transitway. Future corridors will likely provide distinct results. The

overall goal for rapid transit in Winnipeg should be one of constant refinement and improvement, building on successful approaches and examples both from within the city and best practices from other cities. This means that further research is always warranted, and is in fact an important component of helping Winnipeg reap the maximum benefits from its rapid transit investments. Ongoing analysis will assist politicians, transit officials, planners, developers, and other decision-makers in making the best decisions on new rapid transit routes and transit-oriented developments. This will help Winnipeg build a more and liveable city that strives to provide all residents with sustainable transportation options.

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## Appendix A: Interview Request Template

Hi *insert name here*,

My name is Adam Prokopanko and I am a Master's student in City Planning at the University of Manitoba. I am doing research into the future of bus rapid transit and transit-oriented development in Winnipeg. I would like to know what insert 'transit authorities'/'city planners'/'or 'property development' stakeholders in the community perceive in this regard.

I will be doing in-person interviews this fall with about twelve other people representing transit authorities, city planners, and property developers who work with rapid transit and/or transit oriented development in both Winnipeg and Ottawa. You have been identified to me as having a valuable perspective to inform my research.

If this is of interest to you, I would greatly appreciate it if you could participate in this study. I anticipate the interview taking between 30 and 60 minutes. I would be happy to meet you during the day or in the evening at your convenience. If you prefer, we can conduct the interview via phone or Skype. If you would like more information, please feel free to ask any questions that you have. I can also forward you a copy of my practicum proposal if you would like to know more about it.

This project has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints, you can talk to me or the Human Ethics Coordinator at 204-474-7122 or email: [margaret.bowman@umanitoba.ca](mailto:margaret.bowman@umanitoba.ca)

Thank you for your time! I look forward to hearing from you.

Sincerely,  
Adam Prokopanko

## Appendix B: Interview Schedule

1. I'm trying to develop a set of factors that can be used to guide the determination of the specific route alignments of the rapid transit corridors proposed in *OurWinnipeg*.
  - a) What is your current professional position?
  - b) What is your experience with bus rapid transit? (how long, in what capacity)
  - c) Do you identify yourself as a stakeholder for bus rapid transit in Winnipeg?  
If so, from any particular perspective?
2. (especially important for Ottawa interviews, will be used for Winnipeg interviews if applicable where informants self-identify as having knowledge)
  - a) What factors and considerations did Ottawa use to determine the routing of Transitway corridors in the 1980s to 2000s?
  - b) Have the transitway routes generated transit-oriented development nearby? Did development occur in the Central Business District? In the suburbs?
  - c) How have these factors changed for the construction of the Confederation LRT line and other recent transit projects?
  - d) How has rapid transit influenced development in Ottawa?
  - e) What lessons should Winnipeg take from Ottawa's experience?
3. (for Winnipeg interviews)
  - a) From your perspective as a stakeholder, what are the most important factors to be considered when selecting a route for the rapid transit corridors identified in *OurWinnipeg*?
  - b) What factors have been/need to be considered for rapid transit corridors near greenfield sites? (i.e. Parker lands, Southwood lands)
  - c) What factors have been/need to be considered for rapid transit corridors in proximity to built-up urban areas? (i.e. along CN Letellier corridor, Raleigh/Gateway corridor)
  - d) What factors need to be considered for rapid transit corridors in arterial road right-of-ways? (i.e. along Portage Avenue and Main Street)
  - e) Where options exist, which type of corridor (near Greenfield sites, near built-up areas, or in an arterial right-of-way) do you think is preferable for development?
4. (for all interviews)

Considering that the City of Winnipeg has proposed the construction of rapid transit corridors (described in *OurWinnipeg*)...

  - a) What factors should be considered to provide the greatest benefit to the long-term development of the City of Winnipeg?
  - b) What factors should be considered to maximize the feasibility of transit-oriented development occurring?
  - c) What factors should be considered to ensure that potential development takes place according to transit-oriented development planning principles (in the City of Winnipeg's *Transit-Oriented Development Handbook*)?

## Appendix C: Ethics Submission

### 1. Summary of Project:

#### *Purpose:*

The city of Winnipeg is faced with a situation common to many North American cities. Winnipeg's infrastructure deficit continues to grow and the city cannot afford to continue to expand infrastructure and services to cover ever-increasing suburban development. Developing in a more sustainable, compact manner, means, among other things, investing in public transit. A key component of transit investment in Winnipeg is the construction of a network of rapid transit corridors that will serve as the backbone of the transit system. The problem currently facing Winnipeg Transit is that there are often multiple routes under consideration for these corridors. The evaluation process currently used to select the preferred route is based primarily on transit performance and existing land-use conditions. The long-term development potential along transit corridors is not effectively measured and considered amongst the numerous other factors.

This project is titled *Rapid Transit Routing in Winnipeg: Determining Factors for Corridor Selection*. The purpose of this project is to evaluate the effects on public transit ridership, quality of service, and impact on adjacent development from the first phase of bus rapid transit in Winnipeg, with the findings applied to planned future corridors to ensure the best possible routes are selected. I want to identify which factors are most important when selecting a future corridor alignment that maximizes the potential for transit-oriented development along with effective transit and transportation operations. My underlying assumption is that rapid transit corridors have significant potential to influence future development in Winnipeg.

#### *Methodology:*

The primary segment of the research will consist of a series of semi-structured interviews conducted with key informants in both Winnipeg and Ottawa. This style of interview will offer the opportunity to generate primary data from stakeholders in the field of rapid transit and associated development. The people selected for interviews will be from transit authorities, city planners, and property developers involved in transit-oriented developments. It is anticipated that in each city at least two people will be interviewed from each of the three groups identified, for a total of about twelve interviews. These numbers may change slightly depending on the success or failure of identifying suitable and willing interviewees. There will also likely be more interviewees in Winnipeg than in Ottawa owing to the interviewer's increased level of familiarity and contacts with Winnipeg stakeholders.

Each stakeholder will be interviewed one-on-one by myself either in person or via phone or Skype for 30-60 minutes. They will be asked a series of open-ended questions intended to provide answers to the research questions and generate relevant discussion about the future of rapid transit in Winnipeg.

### 2. Research Instruments:

The research instruments that I use in this practicum include twelve separate semi-structured focused interviews.

The data for the interviews will be generated by asking participants a set of 14 predetermined questions in three topic areas for the interviews and then adapting/expanding them according to semi-structured interview methodology. (see Appendix B: Draft Interview Schedule) Their responses will either be recorded with an electronic audio device or with a pen and paper, if a participant wishes. The interviews will not take place until the participant has given their explicit consent and has signed a consent form.

### **3. Participants:**

The participants will include representatives from transit authorities, city planners, and property developers who work with rapid transit and/or transit-oriented development in either Winnipeg or Ottawa. I chose them based on their experience of working with transit planning or property development related to bus rapid transit. They will be recruited using their contact information on their organization's website, through publically available phone directories, or based on recommendations from other stakeholders. (see Appendix A: Recruitment Communications)

These particular sets of people have the most experience in regards to a number of critical aspects relating to bus rapid transit that is relevant to Winnipeg and offer informed opinions as key stakeholders. Each of the individuals participating in this research has a role that is uniquely important and they are not easily interchangeable with others outside of their direct colleagues.

### **4. Informed Consent:**

Consent forms will be given to the participants to sign and return to myself. A copy of this form is included this package as Appendix C. It will be printed on the University of Manitoba letterhead. For interviews conducted in-person, participants will have physical consent forms to fill out. For interviews over the phone or Skype, an email copy of the consent form will be sent and a scanned filled-out form or will be returned to me. The completed and signed consent forms will be received prior to the interviews taking place. The form will explain the purpose of the research, the final use of the data, the risks involved, and my commitment to total confidentiality. The participants will never be named in the practicum; pseudonyms will be employed. A list with the real names associated with each particular pseudonym will be stored safely in a word document in a password-protected folder on my computer. This list will be destroyed one year after the completion of the research project (expected completion May 2016, list destroyed May 2017).

### **5. Deception:**

The scenario planning research method involves no forms of deception of any kind. Indeed, it is desirable for the participant to understand the scope and intent of the research when they agree to participate and share their perspectives. The purposes of the research will be clearly explained in the consent forms.

### **6. Feedback/Debriefing:**

A summary of research results will be made available to all participants. Feedback will be made available by email in PDF format, unless the participant requests a different

format. I will also debrief immediately after the interview to let participants know how the information will be used and put into the major degree project.

## **7. Risks and Benefits:**

The consent form shall explain that there are no particular risks for the participants to participate in this study. If there are risks, they are not risks which go beyond normal everyday risks. The interview questions will not address personal or confidential issues. The practicum is only interested in the participant's perspective on the future of bus rapid transit and transit-oriented development in Winnipeg. Participants will receive summaries of our conversations, at which point they will be invited to submit any changes, subtractions, or additions to their comments. These further comments will be accepted until the data-gathering phase has concluded, approximately January 2016. This is the latest date at which I expect to be able to substantively modify the data. The only possible benefit from participating in this research will be because the interview process may stimulate strategic thinking in respect to the future of their organization or business.

## **8. Anonymity & Confidentiality:**

The research participants will not be promised anonymity from me, the researcher, but they will not be personally identified in the final practicum document. Every attempt will be made to protect their confidentiality. Information that they provide during the interview will be coded for use in the project. Recordings of interviews, and notes taken, will be secured during the project and destroyed one year after project completion. (expected completion May 2016, recordings destroyed May 2017).

Participants will be made aware that the general nature of their place of work and the broad parameters of their professional role will be indicated to help contextualize their input and, given this fact, it may be possible for those with special knowledge of these contexts to infer their identities. However, no personal information will be gathered and I will only be asking questions relating to their perspectives on the future of bus rapid transit and transit-oriented development in Winnipeg.

At any stage of the research portion of the study, participants will be offered the opportunity to freely withdraw from the interview and have their responses removed from the final document. They will also be offered the opportunity to review the completed sections of the practicum that involve excerpts from their interview and suggest alterations. If participants wish to withdraw after the interview, or suggest alterations, they will be instructed to contact me directly (prior to the conclusion of the data-gathering phase in January 2016). All audio files and interview notes collected during the research process will be stored in a locked drawer in my home office or in a password-protected digital folder. One year after the project is complete, interview recordings and notes will be destroyed. (expected completion May 2016, recordings destroyed May 2017).

## **9. Compensation:**

There is no credit, remuneration, or compensation for the participant involved in this study. The motivation to participate in the interviews and focus group will most likely be done out of a personal concern over the future of bus rapid transit and transit-oriented development in Winnipeg or out of a professional courtesy. For ease of convenience, the interviews may take place at the participant's place of work but the timing and location will



be up to each participant. Any participant who does not want or cannot have an in-person meeting at their place of work may be interviewed over the phone or Skype.

#### **10. Dissemination:**

The informed consent form will explain that a summary will be emailed to all participants and for those interested, the full practicum will be made available.

I will attempt to disseminate the results of the practicum with the professional planning community by presenting my findings at the Manitoba Planning Conference and/or Canadian Institute of Planners Conference.