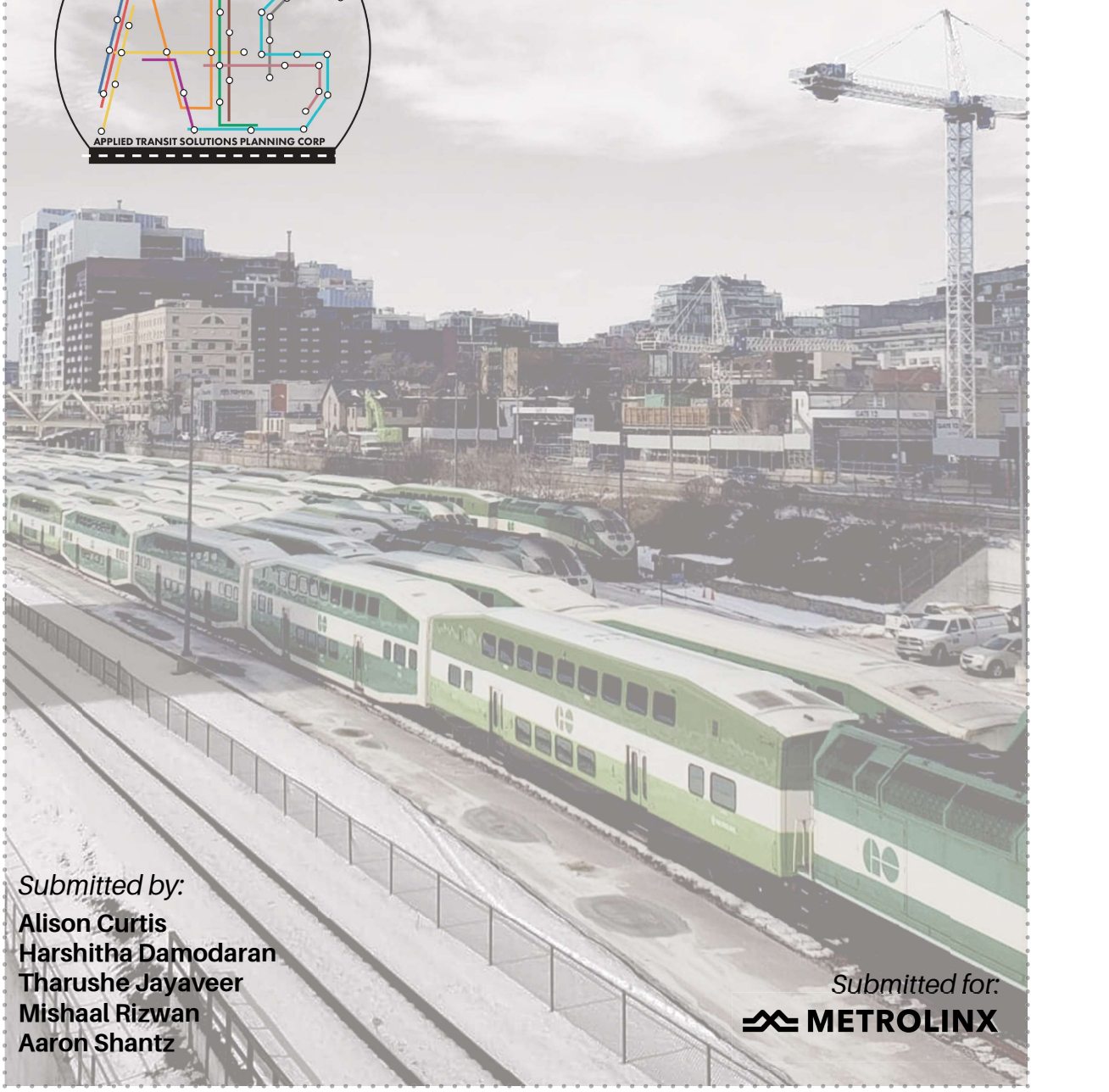
Land Use Planning Guidelines for Bus Rapid Transit and Priority Bus Corridors

For the Greater Toronto and Hamilton Area



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Executive Summary

Many Canadian municipalities currently have land use policy frameworks that support and complement Rapid Transit Networks, such as Light Rail Transit and subway connections. However, land use planning policies for lower order modes of frequent rapid transit, such as Bus Rapid Transit (BRT) are not well understood. The 2041 RTP identified five BRT and/or Priority Bus projects in-development, with an additional 45 services proposed in the 2041 expansion plan.

The development of a preferred land use policy framework and related guidelines is vital to ensure the implementation of transit-oriented land use designations along existing and planned BRT/Priority Bus corridors, as outlined in the 2041 RTP. The implementation of such a framework and guidelines will ensure that these transportation services are complemented by surrounding land use designations which will encourage transit use and projected ridership figures.

In September 2019, ATS Planning Corporation was assigned with the task of a three-phase project. The first phase consisted of conducting a best practices review of land use policies which support the three key themes of connectivity, intensification and the design of North American BRT and Priority Bus Corridors. The second phase entailed the creation of suggested guidelines based on the best practices review. The third phase consisted of applying the guidelines to a selected BRT or Priority Bus corridor within the proposed FRTN. The purpose of this report is to present the key findings of each phase of the project and provide recommendations and future research opportunities.

Findings

A common misconception of BRT and Priority Bus systems is its definition. Majority of municipalities in Canada are operating Priority Bus systems, but are referring to or classifying these systems as Bus Rapid Transit. Some common characteristics of both systems are that they are high-frequency, high-capacity public transit services with elevated levels of investment and infrastructure.

Halifax, Calgary and Seattle were identified as the three municipalities with best practices for land use policy that support the three main themes. These best practices led to the creation of the suggested policy framework which highlighted objectives such as infill development, active transportation, and pedestrian-oriented street design in addition to others.

The Highway 7 West Bus Rapid Transit corridor located in York Region was selected for the corridor evaluation. It is evident that the existing land use policies support connectivity and design with few weaknesses. However, the land use policies which support intensification can be improved.

Upon completing this project, future research opportunities were brought to light. This report provides suggestions for methodology and long-term opportunities which involve engaging with relevant stakeholders. An ex-ante approach to this project is crucial to observe whether land use policies have impacted the three themes of intensification, connectivity and design.

Respectfully submitted,

ATS Planning Corporation

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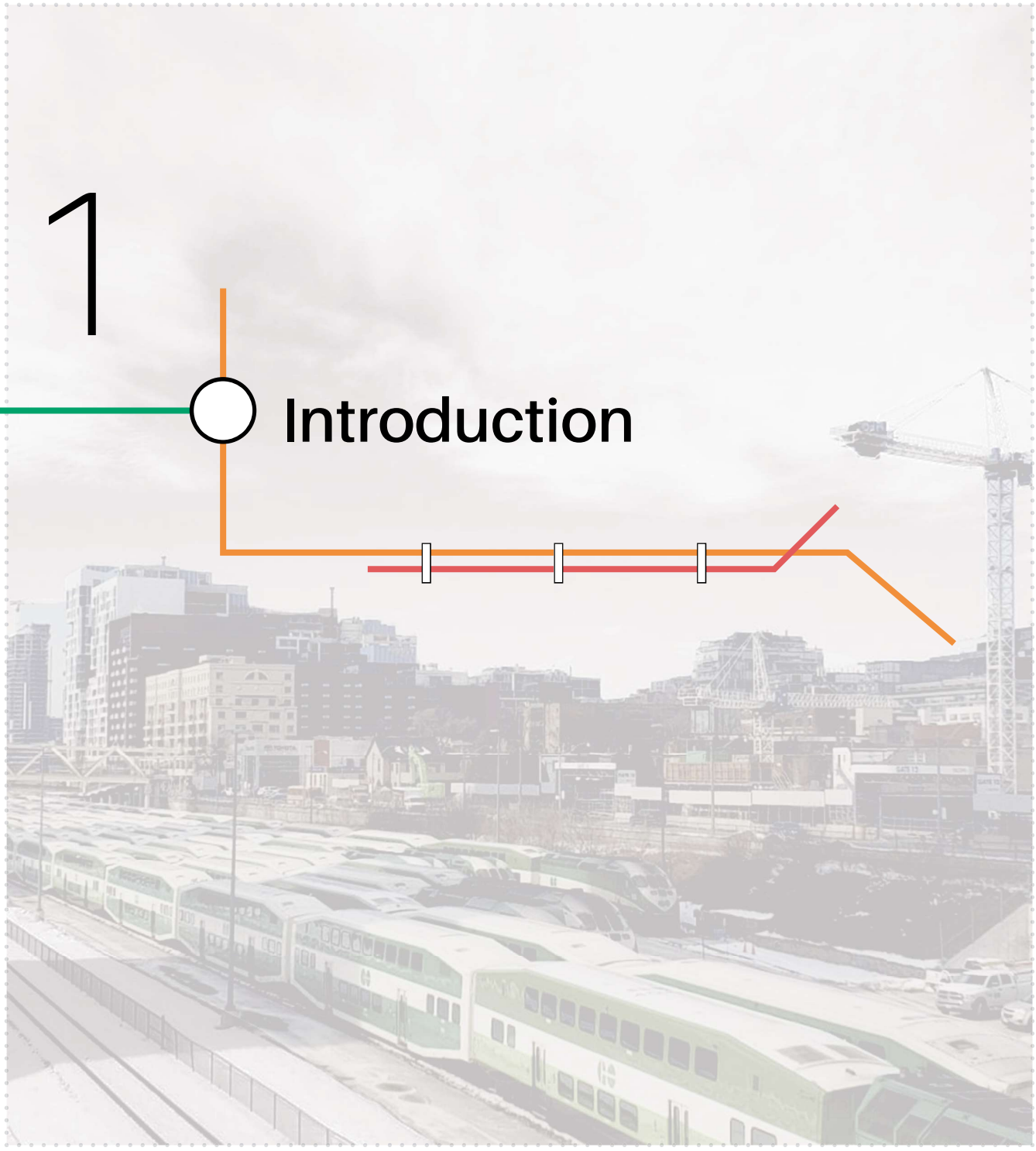
1 Introduction



1.1. Project Context

In 2006, the Government of Ontario created Metrolinx, a regional public transportation agency, tasked with the responsibility to plan, build, operate, and connect transportation in the Greater Toronto and Hamilton Area ("GTHA"). In order to guide and prioritize the expansion of transportation infrastructure and service in the area, Metrolinx released the region's first-ever regional transportation plan in 2008 titled "The Big Move". This policy allowed the agency to deliver on their mandate to provide better, faster, and easier transit connections. It generated a common vision for the region and a guide of how to transform transportation across the GTHA.
Currently, growth and the expansion of public transit in the GTHA continues. As such, Metrolinx has released the 2041 Regional Transportation Plan ("RTP"), seen as an update to "The Big Move". This document allows Metrolinx staff, regional stakeholders, and citizens to visualize a future of how communities and cities in the area can be better connected. The RTP is also a guiding framework of how these goals can be accomplished. Within the RTP, Metrolinx outlines five strategies that they aim to complete by the end of 2041, including:

1. Complete the delivery of current regional transit projects;
2. Connect more of the region with frequent rapid transit;
3. Optimize the transportation system;
4. Integrate transportation and land use; and,
5. Prepare for an uncertain future.

It is clear that the 2041 RTP does not just concern itself with investment in physical infrastructure and transportation services, but also focuses on broader land use planning strategies that can be leveraged to develop and support sustainable transportation throughout the region.

Chapter 3 of the RTP outlines these strategies in detail, and proposes various solutions that can be implemented to achieve these goals. Strategy #2 of the RTP outlines how a Frequent Rapid Transit Network ("FRTN") shall be developed throughout the region, but also states that there is a need to ensure that the network is supported with appropriate land uses and densities. This is consistent with basic land use planning principles, which state that high density, mixed use developments are more likely to result in an urban environment that is transit supportive. Developing a land use planning framework for FRTN corridors will assist in implementing Metrolinx's objectives, as it should promote land uses and density in a manner that supports and complements the FRTN.

Many jurisdictions in Canada currently employ land use planning frameworks that support higher order levels of frequent rapid transit, such as Light Rail Transit and subway systems. However, the understanding of how land use planning frameworks can be used to support lower order modes of frequent rapid transit, such as Bus Rapid Transit (BRT) and Priority Bus services, is understood to a lesser extent. The RTP states that five BRT and/or Priority Bus projects are currently in-development, with another 45 services proposed. It is evident that a preferred land use planning framework and supportive guidelines need to be developed to ensure that transit-oriented land use designations are implemented along existing and planned BRT/Priority Bus corridors, as outlined in the RTP. This will ensure that these transportation services are complemented by surrounding land use designations which will encourage transit use and projected ridership figures.

1.2 Project Scope

Metrolinx has developed guidelines to support intensification around Mobility Hubs and within Major Transit Station Area ("MTSA") but has now identified a need to establish land use frameworks and guidelines to support development along BRT and Priority Bus corridors that are part of the FRTN. These frameworks and guidelines will encourage development that can support the use of transit, maximize the use of community amenities, and improve the overall urban structure of the area.

Under A Place to Grow (2019), municipalities are required to conduct planning studies along BRT corridors and within MTSAs. Despite not operating in a dedicated right-of-way, Priority Bus corridors should also be studied as they are also an effective method of enhancing regional connectivity. Our research will assist Metrolinx in fulfilling Strategy 2 through a best practices review of North American cities which will help to establish land use planning frameworks and guidelines for BRT corridors. The suggested policy framework will then be applied to a corridor as identified in the RTP to recommend policy changes that will support these corridors.

The project was divided into three phases.

The following tasks were completed as part of Phase 1:

Review the RTP to familiarize our team with the BRT and Priority Bus corridors that are a part of the FRTN. It is important to note that local transit providers identified within the RTP may use different definitions for BRT and Priority Bus systems. As a result, we will refine definitions and descriptions of these types of corridors based on our review. Our best practices review of North American cities will examine municipalities that have similar urban structures and geographic context as those within the RTP. This review will allow us to identify land use policies and design guidelines that support intensification and connectivity.

Policy Review: A review of the RTP and additional planning documents was completed to identify key jurisdictions where BRT and Priority Bus corridors are included as part of the FRTN. Throughout this task, we also refined and described the definitions for BRT and Priority Bus corridors for the purpose of the best practices review.

Identification Process: Municipalities within North America that have BRT and Priority Bus corridors were identified.

Best Practices Review: A best practices review in case study format of three municipalities within North America was conducted.

The following tasks were completed as part of Phase 2:

Phase 2 entailed the development of the suggested land use planning framework and guidelines to be applied to FRTN corridors identified in the RTP. This framework was to be based on the best practices review conducted in Phase 1.

Policy Framework Development: as part of Phase 2 a suggested framework and guidelines based on the best practices review was created.

The following tasks were completed as part of Phase 3:

Phase 3 applied the suggested framework and guidelines developed in Phase 2 to a selected BRT and/or Priority Bus corridor(s) within the proposed FRTN. This analysis demonstrated how the framework could be applied to support intensification, connectivity, and good design principles. Three key tasks were completed in this phase as follows:

Corridor Evaluation: A BRT and/or Priority Bus corridor(s) was selected and evaluated with the suggested framework and guidelines. A set of recommendations and suggestions were provided to the existing land use planning policies for the selected corridor to ensure that intensification, connectivity, and good design principles could be met.

Final Deliverables: The final task in phase 3 was to develop and submit a final report and presentation containing all of the work completed during previous phases.

1.3 Report Description

The report is organized into seven sections. The next sections of this report will summarize the policy context for Ontario and for the Greater Toronto and Hamilton Area (GTHA). The subsequent sections present the methodology and findings of the Best Practices Review. Three municipalities were identified using the selected criteria, including Calgary, Alberta; Halifax, Nova Scotia; and, Seattle, Washington. The results of the Best Practices Review were then used to establish a Suggested Guidelines and Framework which was then used to evaluate the Highway 7 West BRT corridor in the City of Vaughan. The report concludes by summarizing findings, and suggestions for future research and directions.

2 Policy Context

The Province of Ontario recognizes the benefits that transit-oriented communities offer to Ontarians and supports the development of these communities through its policies. This section of the report discusses Provincial Legislation that is applicable to this study to provide context for the project. The following pieces of legislation and regulation are covered: *The Planning Act (2019), Provincial Policy Statement (2014) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019). The Metrolinx Act (2019)* is included in Appendix A.

2.1 Planning Act

The Ontario Planning Act (2019) delegates and assigns much of the authority and responsibility to municipalities to undertake land use planning within their jurisdictions, as well as establishing the rules and legislation that municipalities must conform to or be consistent with when making planning decisions. The Act identifies 20 matters of Provincial Interest that all planning authorities shall have regard to when carrying out their responsibilities. Two of the Provincial Interests apply specifically to provision of transit services:

(f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems;

(q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;

While transit is not explicitly mentioned, the following Provincial Interests are also applicable to our study:

(h) the orderly development of safe and healthy communities;

(p) the appropriate location of growth and development;

(r) the promotion of built form that,

(i) is well-designed,

(ii) encourages a sense of place, and

(iii) provides for public spaces that are of high quality, safe, accessible, attractive and vibrant;

There are three important sections of the Planning Act (2019) that provides tools which planning authorities can use to implement transit-supportive land use planning (Ministry for Municipal Affairs and Housing, 2009). These three sections are: Section 34, Zoning By-laws; Section 41, Site-Plan Control; and, Section 16, Official Plans. Section 34 Zoning By-laws allow a planning authority to regulate land-use, height and density, and mix of land use along transit corridors (Ministry for Municipal Affairs and Housing, 2009). Section 41 allows planning authorities to set out requirements for site development which can be supported by guidelines for the design and character of new development or re-developments. A planning authority could set out guidelines for orienting buildings to the street, active uses and store fronts on the street level and other pedestrian friendly design measures along transit corridors. Section 16, Official Plans, sets out what shall be contained in an official plan, policy areas and what they can include, and the review and amendment of official plans. Three items within Section 16 are applicable to the provision of transit. Subsection 16(5)(a), regarding Official Plans gives, planning authorities the power to include policies for protecting major transit station areas as identified with subsection (15) and (16) of this section (Planning Act, 2019). Subsections 16(15) and 16(16) allow single- and upper-tier municipalities to include policies for the areas surrounding a planned or existing higher order transit station or stop, and these can include: (a) minimum number of residents and jobs collectively per hectare; (b) the use of land and buildings and structures; and, (c) minimum densities (Planning Act, 2019).

2.2 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest as identified in the Planning Act (2019) (PPS, 2014). The PPS seeks to improve land use planning, so it is more effective and efficient, as well as improve the quality of life for all Ontarians (PPS, 2014). There are three main policy areas covered in the PPS, and they are: Building Strong Communities; Wise Use and Management of Resources; and, Protecting Public Health and Safety. Policies applicable to transportation can be found in the Building Strong Communities section. Policy section 1.6 of the PPS outlines policies on Infrastructure and Public Service Facilities, which include Transportation Systems and Transportation and Infrastructure Corridors. These policies cover the provision of transit; establishing supportive infrastructure through density, mixed-uses and land-use; and, multi-modal transportation and connectivity. Refer to Appendix A for the applicable policies.

Section 1.6.8 of the PPS outline the policies for Transportation and Infrastructure Corridors. These policies seek to protect these corridors from development that may negatively impact their operation, as well as ensuring that there is wise use and management of resources (PPS, 2014). The third section of the PPS that is applicable to transit is section 1.8 Energy Conservation, Air Quality and Climate Change. This section lays out policies to support development that is compact around nodes and corridors, focusing new developments near sites serviced by transit, improving the mix of employment and housing, and the promotion of active transportation.

2.3 A Place to Grow: Growth Plan for the Greater Golden Horseshoe

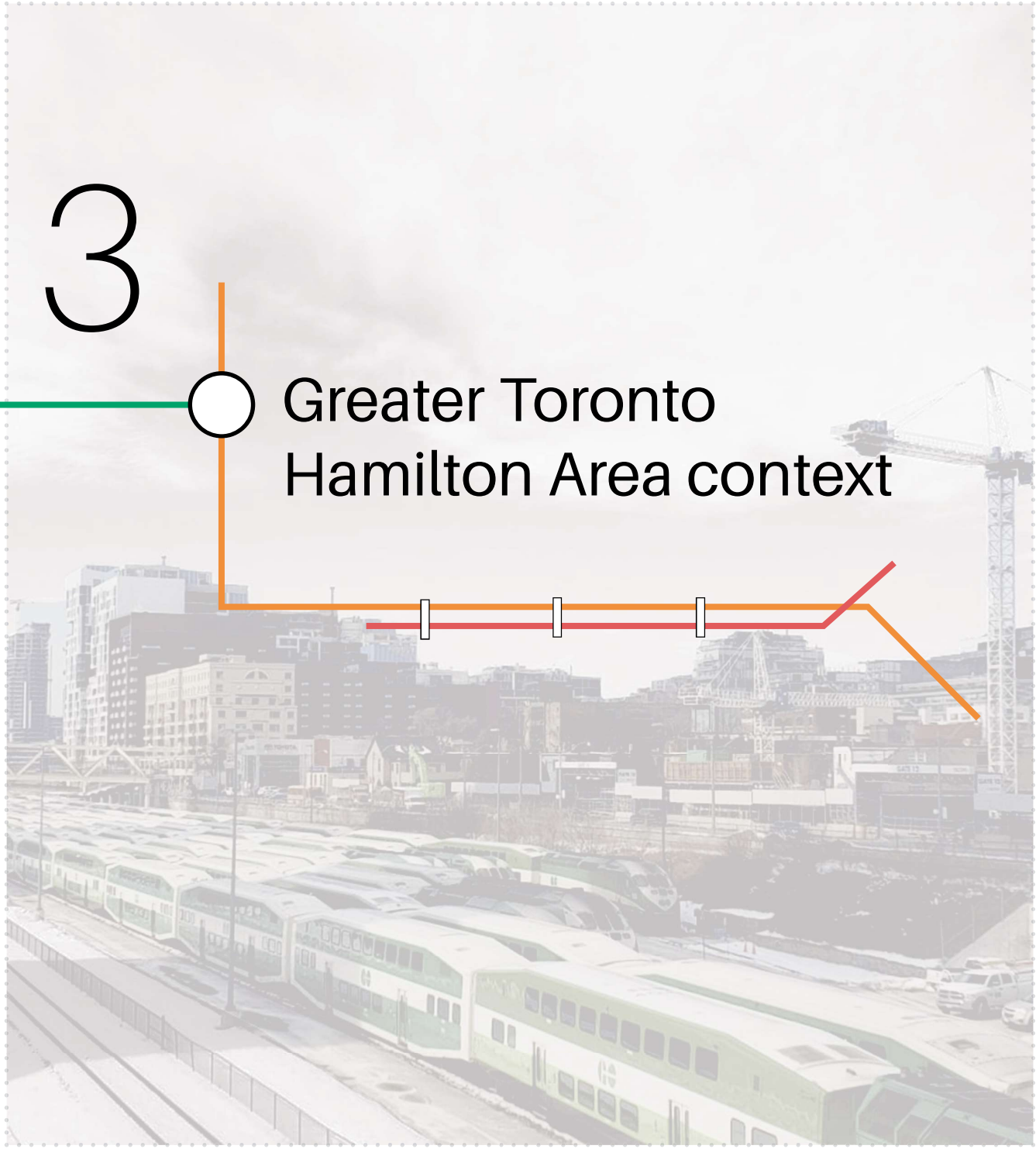
A Place to Grow, 2019 replaced the 2017 Growth Plan, and provides policy direction for growth and development within the Greater Golden Horseshoe. The vision statement for the Greater Golden Horseshoe in A Place to Grow includes: a sufficient housing supply; integrated and accessible transit systems; a healthy environment; the protection of natural areas and agricultural lands; vibrant urban centers with compact urban development; a strong economic presence; and, high quality of life for residents. It also identifies ten guiding principles for the development of land, protection of resources and investment of financial resources. Some of these principles place emphasis on intensification, the creation of complete communities, investment in public infrastructure and the creation of mixed-use development.

There are four main policy sections of A Place to Grow that apply to the provision of transit services. Section 2.2.2 sets out the density targets for Delineated Built-up Areas and requires 50 per cent of all residential development in Barrier, Brantford, Guelph, Hamilton, Orillia and Peterborough and the Regions of Durham, Halton, Niagara, Peel and Waterloo to be within the Delineated Built-Up Areas. The second section is 2.2.3 which sets out the density targets for Urban Growth Centers. Urban Growth Centers is Toronto must have a density of 200 residents and jobs combined per hectare by 2031. Downtowns in Brampton, Burlington, Hamilton, Milton, Markham Center, Midtown Oakville, Oshawa, Pickering, Richmond Hill Center/Langstaff Gateway, Vaughan Metropolitan Center, Kitchener and Uptown Waterloo must have a density of 200 residents and jobs combined per hectare by 2031. The density target for Downtowns in Barrier, Brantford, Cambridge, Guelph, Peterborough and St. Catharine's is 150 residents and jobs combined per hectare by 2031. The third is Section 2.2.4 of Where and How We Grow,

Transit Corridors and Station Areas, and it provides direction on how development should occur along transit corridors and around stations. Policies in this section include: setting intensification minimums; implementing infrastructure to support active transportation along corridors and to station areas; encouraging mixed-uses; and, delineating boundaries for corridors and station. It is important to note that A Place to Grow defines a Major Transit Station Area as the area within 500 to 800-meter radius, which is representative of a ten-minute walk.

Section 3.2.2, Transportation – General, of the Policies for Infrastructure to Support Growth, provides direction to coordinate land use planning and transit investment to support growth. The policies in this section encourage the creation of complete streets, providing opportunities for multimodal transportation to increase modal share, provide safe routes, and the implementation of transportation demand management policies. The fourth section is Section 3.2.3 of Policies for Infrastructure to Support Growth, Moving People, and this policy section provides direction for ensuring efficient and effective provision of transit services and active transportation. The policies in this section discuss: prioritizing transportation infrastructure; connecting transit services to areas with high residential and employment densities; creating linkages between urban centers and municipalities; and, ensuring active transportation is integrated with transit services.

3 Greater Toronto Hamilton Area context



3.1 Geographic Area

Under *Ontario Regulation 189/09*, the GO Transit service area is comprised of a variety of upper-tier and single-tier governments located within the Greater Golden Horseshoe. These municipalities include the upper-tier municipalities of:

> *Dufferin, Durham, Halton, Niagara, Peel, Peterborough, Simcoe, Waterloo, Wellington, and York;*

And the single-tier municipalities of:

> *Barrie, Brant, Brantford, Guelph, Hamilton, Kawartha Lakes, Peterborough, and Toronto.*

The GO Transit service area is illustrated in Figure 3.1

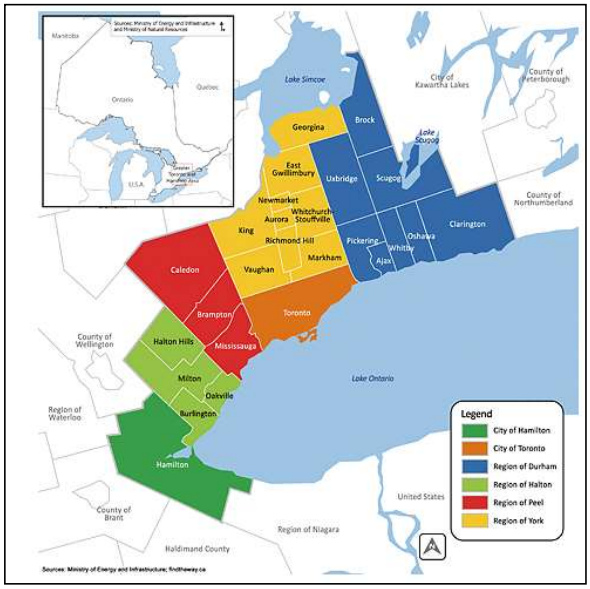


Figure 3.1: Map showing the extents of the Greater Toronto Hamilton Area. Source: The Big Move(2008).

When the FRTN is considered, the implementation and expansion of infrastructure and service is mainly contained within the GTHA. This is stated in the Metrolinx 5-Year Strategy (2015-2020) and the RTP. Expansion of rapid transit services are mainly contained within this area as population densities and commuter patterns are abundant to the point where ridership on higher levels of transit, such as Priority Bus or BRT systems, would be sufficient. This is shown as census data reveals that the GTHA is the most populated and fastest growing urban area in Canada (The Big Move, 2008). Refer to Figure 3.1, above, for a map of the GTHA.

3.2 Demographics

The population within the GTHA is currently about 6.5 million residents, and is projected to increase to 8.6 million residents by 2031 (The Big Move, 2008). Currently, this represents roughly 18.5% of Canada's population, and roughly half of the population of Ontario (Statistics Canada, 2016). City officials have described the area as the centre of Canada, as it is an international destination for business, finance, arts, and culture. Additionally, the presence of the Toronto Stock Exchange, the headquarters of Canada's five largest banks, and the existence of a variety of technology firms makes the area Canada's largest economic engine. Additionally, the presence of a variety of manufacturing, industrial, and distribution firms at the fringe of the urban area results in a well-diversified economy.

A variety of economic forces has allowed for emerging markets to thrive in the area when compared to other locations throughout North America. For example, the presence of a variety of technology and computing firms in the area can be attributed to the presence of the University of Toronto, Ryerson University, McMaster University, and the University of Waterloo. The specialization of these universities in the field of computer science and engineering has generated

spill-over effects, where recent graduates have shared ideas and knowledge which has resulted in a variety of successful start-ups and technology companies. As a result, city officials have often referred to this area as "Canada's Technology Triangle", as no other area in Canada specializes in this type of production to the same degree.

Additionally, a large portion of workers involved in the Finance, Real Estate, and Insurance sectors are concentrated in this area. This can be attributed to agglomeration effects, where workers that are involved in the same type of production work in close proximity to one another for competitive advantage purposes. This can include being available for meetings or collaborating on various projects. As such, the presence of major employers, such as the Toronto Stock Exchange and the headquarters of Canada's five biggest banks are located in the area.

3.3 Municipalities

As illustrated above, a number of lower-tier, upper-tier, and single-tier municipalities exist throughout the GTHA. In total, four upper-tier municipalities including the Regions of York, Peel, Halton, and Durham are present, as well as the single-tier municipalities of Toronto and Hamilton. Several notable lower-tier municipalities including the cities of Oakville, Mississauga, Vaughan, and Burlington are just four of 24 lower-tier municipalities present within the area. Refer to Appendix B for a comprehensive list of municipalities and their classification that are present within the study area.

3.4 Growth and Transportation in the Greater Toronto and Hamilton Area

Regardless of the implementation of Metrolinx, transportation within the GTHA is still plagued by long travel times, a lack of regional public transportation connections, and unreliability throughout the network. This can be attributed to two causes.

First, the area that encompasses the GO Transit service area is Canada's largest urban region, and residents are widely dependent on the automobile for their main mode of transportation. As mentioned above, the population of the area comprised approximately half of the provinces total population, and is expected to grow by another 2 million residents over the next 20 years. However, the most recent Transportation Tomorrow Survey shows that the majority of households either own or have direct access to an automobile, and that they are used often. This is shown in the City of Toronto, as the average household completes approximately 4.6 trips per day, with approximately 57% of these trips being completed by automobile (TTS, 2018). Considering that large and dense populations typically use public transit at a higher proportion, these statistics are concerning as it shows that private automobile use is still the dominant mode of transport. Negative externalities that are a result of this trend will only become more abundant as population numbers continue to grow.

Secondly, continued investment in automobile infrastructure and a resulting lack of alternative regional transportation options has reinforced the prior observation. This is shown as regional transportation needs are currently satisfied by a network of expressways that service all areas of the GTHA, whereas only a couple of bus projects have been completed in recent years. For example, east-west expressway connections are provided via the Queen Elizabeth Way, the Gardiner Expressway, as well as Highways 401, 403, and 407. North-south connections

are provided via the Don Valley Parkway, Highway 410, and Highway 427. Notably, these expressways collectively provide access into the central business district of the city in all radial directions. Additionally, investment in infrastructure for these expressways has been large, as widening of various portions of these expressways coupled with several major rehabilita tion projects has resulted in more travelers choosing to use these systems. This is shown as only a small percentage of trips within the GTHA, as well as trips originating from outside the study area into the GTHA, are completed using public transit, whereas the majority of trips into and out of the area are completed via single-occupancy automobiles (TTX, 2016). In contrast, Metrolinx has only established three BRT corridors in the area, including the Mississauga Transitway, the Highway 7 East BRT, and the Davis Drive BRT. More investment in these systems is needed in order to establish quick and reliable connections with other rapid transit modes, while also ensuring that more people settle within these areas to reduce their journey to work distance in the first place. However, the lack of convenience, comfort, and reliability missing in the current system is a contributing factor to congestion, unreliability, and increased travel times, as most people are forced to use an automobile as their main method of transportation.

3.5 York Region Transit and VIVA

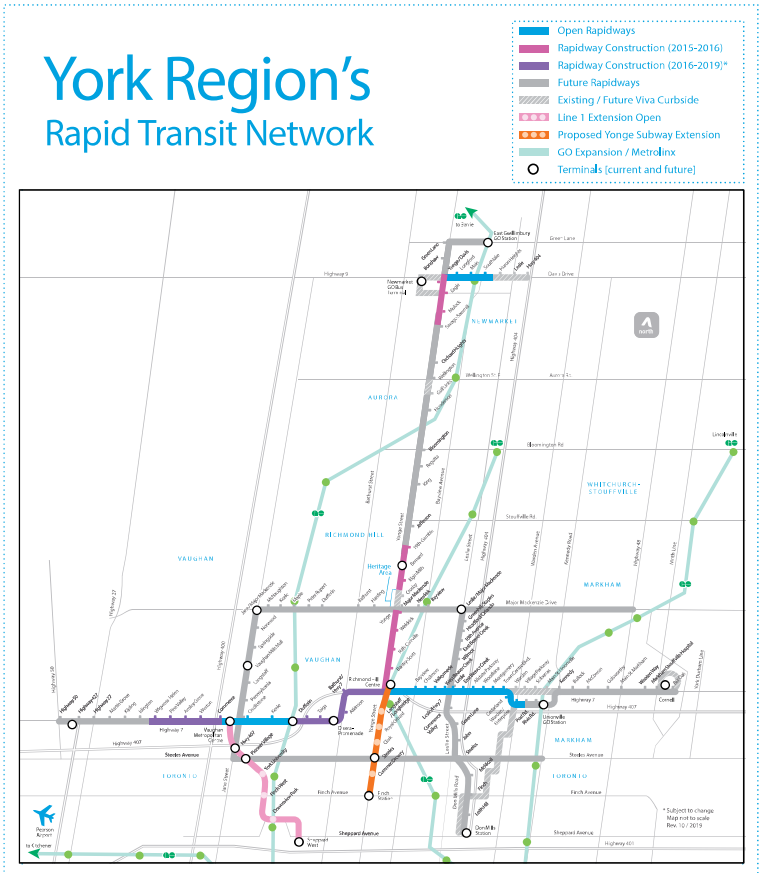


Figure 3.2: Route Map of York Region's Rapid Transit Network. Source: VIVA

York Region Transit is one municipal service provider that provides public bus service in the Greater Toronto and Hamilton Area. York Region Transit provides service to a variety of communities located to the northwest of the City of Toronto, including the municipalities of Vaughan, Markham, Richmond Hill, Newmarket, and Aurora. Transit service is divided into four geographical divisions which are operated by four independent contractors.

In addition to providing local levels of service in these areas York Region Transit also offers priority bus service called VIVA. Six routes are currently in operation, which form the spine of the network. VivaNext, a bus rapid transit that consists of dedicated rapidways, is being planned and implemented throughout the region. Metrolinx selected several major components of the VivaNext plan to receive provincial funding in 2009, including the construction of several rapidways. The purpose of these rapidways is to link major population and growth centres within the region, at a fraction of the cost compared to light rail transit or subway implementation.

Refer to *figure 3.2* for a map of planned and proposed service.

4 Best Practices Review

4.1 BRT and Priority Bus Definitions

4.1.1 Common Characteristics

Bus Rapid Transit (BRT) and Priority Bus systems are high-frequency, high-capacity public transit services designed to move customers across long distances with shorter travel times when compared to conventional public bus services. BRT and Priority Bus systems have elevated levels of investment and infrastructure in order to increase the level of comfort, convenience, and reliability of the system. BRT and/or Priority Bus systems may have any or all the following systems components in order to accomplish these goals:

- Off-board fare collection
- Platform-level boarding
- Real-time passenger information displays
- Dedicated terminals / stations
- Distinct branding / marketing
- Articulated vehicles,
- Supporting bicycle infrastructure and parking
- Multiple entry / egress points on vehicles

4.1.2 Bus Rapid Transit

BRT and Priority Bus systems are differentiated by the type of right-of-way in which they operate. For a system to be classified as a BRT, vehicles MUST operate in a dedicated right-of-way that contains a physical and visual separation that excludes other modes from interfering with the operation of the transit vehicles. Some examples include operating in a transitway, operating in bus lanes that are separated from other traffic by curbs or physical barriers, and the use of signage to identify that the right-of-way is intended for public transit vehicles only. BRT systems must also have the system components of signal priority and increased stop spacing.

4.1.3 Priority Bus

For a system to be classified as Priority Bus, the system will contain the components of signal priority and increased stop spacing, but will operate in either a shared right-of-way, or a right-of-way that only has visual separation from other modes. Some examples include operating in mixed traffic, operating in high-occupancy vehicle lanes, or operating in exclusive bus lanes/bus-bypass lanes. In other words, this system will have an advanced level of service compared to conventional bus services, but does not contain any physical infrastructure that prevents other modes from interfering with transit operations.

systems, but are referring to or classifying these systems as Bus Rapid Transit. For example, only 4 of the 16 municipalities actually operate BRT systems according to the definitions in section 4.1, but no municipality refers to its system as a Priority Bus system. Refer to Appendix B for a complete list of municipalities and an assessment of their system classification.

4.2 Database Description

After desktop review, a comprehensive list of municipalities within Canada that operate BRT and/or Priority Bus systems was formulated. In total, 16 municipalities and systems were identified. The common characteristics and formal definitions that were drafted in section 4.1 were applied to these systems to observe if municipalities were using correct definitions for their systems. It was found that the majority of municipalities in Canada are operating Priority Bus systems, but are referring to or classifying these systems as Bus Rapid Transit. For example, only 4 of the 16 municipalities actually operate BRT systems according to the definitions in section 4.1, but no municipality refers to its system as a Priority Bus system. Refer to *Appendix C* for a complete list of municipalities and an assessment of their system classification.

4.3 Methodology

4.3.1 Selection Criteria

Policy documents such as official plans, transportation master plans, active transportation plans and design guidelines were reviewed for all Canadian municipalities with BRTs. It is important to note that municipalities which are currently (October, 2019) reviewing policy documents were excluded during the review process. For example, a municipality which noted that its official plan was under review, and removed its policy documents off its official website was not examined for the best practices review.

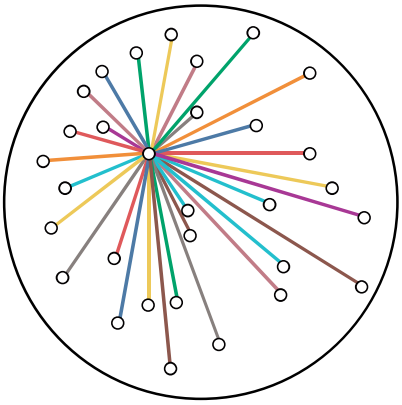
Upon reviewing the documents, certain municipalities included policies to support the three key themes: intensification, connectivity and design. Municipalities with policies followed by action statements, secondary plans or strategic plans catered to a specific theme were shortlisted for the best practices review because this demonstrated a strong implementation of effective land-use policies and design guidelines to support intensification and connectivity along BRT and Priority Bus Corridors. Common characteristics of the policies that were identified for the best practices review consisted of the following:

- Clear visions, goals and objectives
    - Realistic and could be met within the timeline of the plan
    - Not broad; policies could provide specific corridors, action plans
    - Consistent with other sections of the plan and other municipal planning documents

Objectives were identified within each key theme during this process; this will be described further in section 4.3.2. Calgary, Halifax and Seattle were selected for the best practices review.

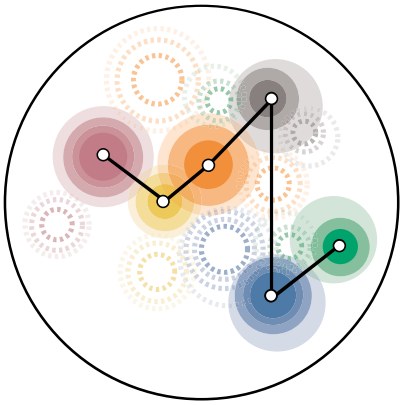
4.3.2 Three Theme Evaluation

During the review process, the following objectives were identified for each theme.



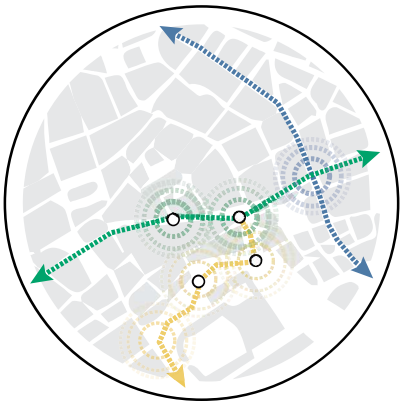
INTENSIFICATION

Infill development (i.e., development of any vacant or under-used parcel along the transit corridor to optimize the land use) and focus on new development (i.e., converting an existing underused property into another by instilling vitality into the community) and areas.



CONNECTIVITY

Intermodal connectivity (i.e., convenient and direct transfers between multiple modes of transportation), active transportation (e.g. integrate walking and cycling with transit services), integrated with development (e.g. locate developments adjacent with transit systems), and provisions of safe and unobstructed routes (e.g. facilitate connections across natural barriers).



DESIGN

Pedestrian street design (i.e,Safe, accessible, well-connected and maintained sidewalks) and and complete streets (i.e, streets for people which enhances the public realm and accommodates people of all ages and physical abilities).

4.3.3 Case Study Structure

Each case study begins with a brief description of the municipality's transportation system and approach for incorporating each theme within its policies. Basic transportation-related statistics are provided, followed by the municipality's definition of BRT and relevant policy documents that were examined for the review. It is important to note that Calgary and Halifax define their systems as a BRT, however as per its characteristics and features it is a Priority Bus as per the definition created in section 4.1. Seattle on the other hand, uses both Priority Bus and BRT systems. Summaries of the three key themes are provided for each municipality. Appendix D outlines all of the policies that were identified for each theme.

Calgary, Alberta

Population (2016): 1,214,839

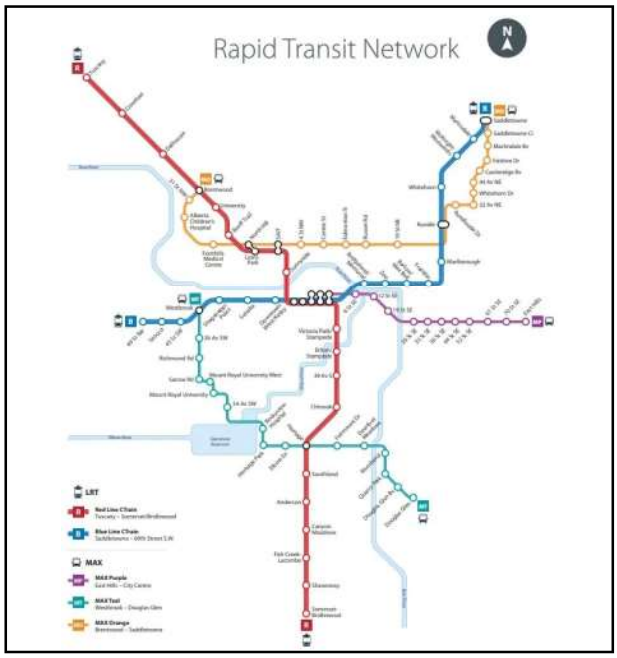


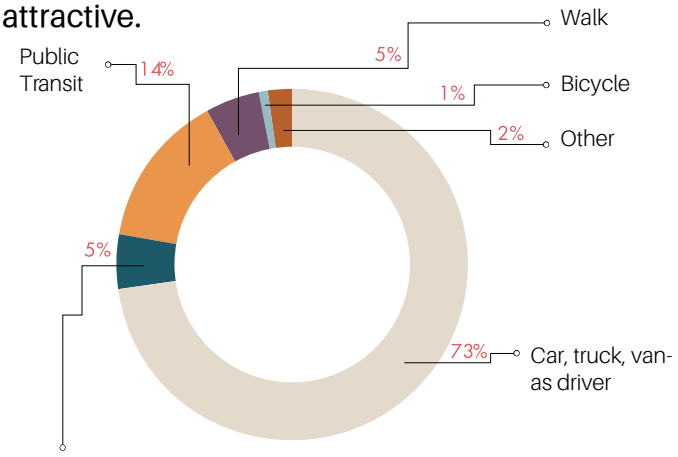
Figure 4.1: Calgary's Bus Rapid Transit network

Ridership: 105.3 million trips
No. of bus routes: 169
No. of bus stops: 5,182
Average trip length: 14.7km
No. of park and ride lots: 30 + 5 private lots

Calgary's definition of BRT

- Limited stop bus service
- Relies on technology to speed up ser vice
- Operates in exclusive transit ways, high occupancy vehicle lanes and any type of road or street
- Convenient fare collection
- Integration with land use policy

The City of Calgary prioritizes its transportation system because of its contribution to shaping its communities, enhancing employment centres, and supporting the economy by assisting the movement of goods, services and people within city, regional and international destinations. The City acknowledges the potential for a transportation system to enhance or degrade the environment and aims to overcome this concern by ensuring that the system is integrated well with its surrounding land uses. The goal of its transportation system is to provide more choices for Calgarians that are convenient, affordable and attractive.

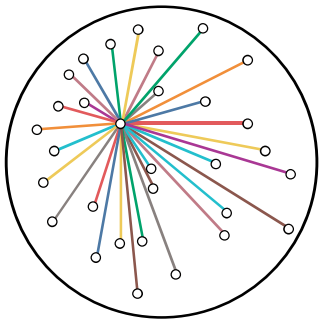


Main mode of Commute by Calgarians

Relevant policy documents

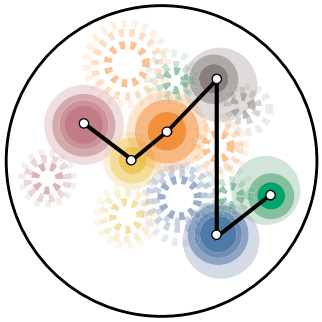
- Municipal Development Plan (2009)
- Calgary Transportation Plan (2009)
- RouteAhead: A Strategic Plan for Transit in Calgary (2013)
- Cycling Strategy (2011)
- Pedestrian Strategy (2016)
- Complete Streets Policy and Guide (2014)
- Transit-Oriented Development Policy Guidelines (2005)

CONNECTIVITY



The City of Calgary recognizes the importance of developing an integrated, multi-modal transportation system which supports land-use, and provides numerous mobility choices for citizens. The City has created policies within the Municipal Development Plan (2009), RouteAhead: A Strategic Plan for Transit in Calgary (2013), Calgary Transportation Plan (2009), and Cycling Strategy (2011) to ensure that it meets it's goals in creating a connected City. Calgary intends to integrate its transit with development by ensuring that its developments are located adjacent to LRT and/or BRT stations to seamlessly integrate with transit facilities. A unique aspect of Calgary's goals for connectivity is its emphasis on sustainable modes of transportation. The City aims to develop a street network to accommodate all modes of transportation including active transportation. Walking and cycling will be integrated with transit services to improve intermodal opportunities at the community, city and regional scales. The City will also identify bus stops with a combination of high ridership and barriers to access such as the lack of sidewalks, to plan and implement future pedestrian and cycling improvements.

INTENSIFICATION



The City of Calgary uses a variety of policy documents to help shape their transit system and broader urban form. The Calgary Transportation Plan (2009), Transit Oriented Development Policy Guidelines (2005), and Municipal Development Plan (2009) outline policies and objectives to encourage intensification of corridors. Calgary places special interest in the areas within walking distance of transit stops and stations and links their land use decision making to transit. Policy creates areas of focus such as Transit Mobility Hubs where intensification and connectivity are aligned. The City also creates guidebooks to make planning processes and land use policies simpler and more accessible. Calgary is directing development and intensification efforts so that development will contribute to increasing ridership.

DESIGN

The City of Calgary believes in the quality of their transit services by planning public transit services into their communities. The Transit-Oriented Development Policy Guidelines (2005) describes techniques for integration of transit services into residential and non-residential areas, supporting the vision of the Calgary Transportation Plan (CTP). The CTP offers three broad policy considerations for transit design. Their first goal is to provide sustainable modes of transportation. It is realised by prioritizing public transit, walking and cycling as the most preferred mobility choices for the majority. The second goal is to optimize infrastructure for all transit users. Providing safe, clean, and comfortable infrastructure will ensure ease of transfer between transit services and other modes. The CTP also emphasizes the accessibility of transit services and infrastructure to all irrespective of age and abilities. Complete streets are the third category. Complete streets, according to the CTP, is achieved by maintaining a right balance between mobility services, green infrastructure and the pubic realm.

Halifax, Nova Scotia

Population (2016): ***1,214,839***

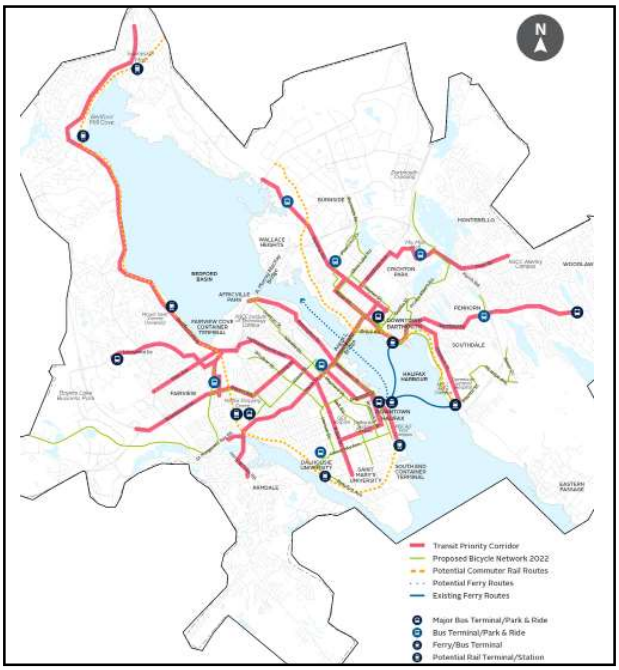


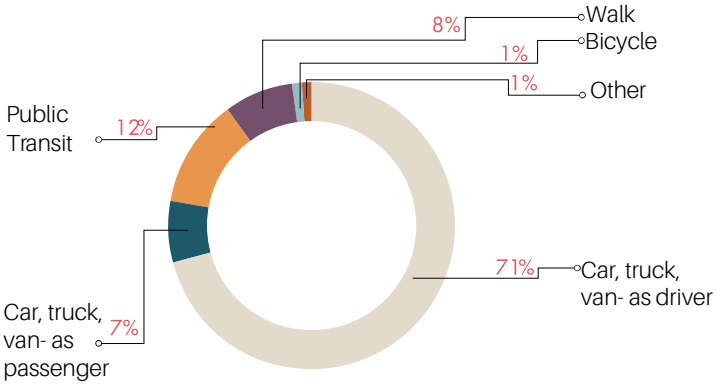
Figure 4.2: Halifax's Rapid Transit network

Ridership (2018-19): 5% increase
No. of bus routes: 69
No. of express bus routes: 17
Bus stop accessibility: 14.7km
No. of park and ride lots: 13

Halifax's definition of BRT

- High-quality, transit system that is fast, frequent, comfortable, high-capacity and cost-effective
- Bus only lanes along the centre of the road to reduce the impact of right turning traffic or parked vehicles
- Off-board fare collection
- Intersection treatments, including signal priority and restricted turn movements
- Conversion from frequent stops to limited terminals

The movement of people from place to place in the Regional Municipality of Halifax has evolved and will continue to evolve over time. The Region aims to enable more people to walk, bicycle, take transit and use other sustainable modes of transportation, however this required rethinking the design of its transportation system and communities. Halifax recognizes the need to create a dense network of streets and reduce the distance between destinations, including employment areas and residences by making it easier and enjoyable to use various modes of transportation. The Region acknowledges multiple benefits associated with active transportation and transit priorities such as, convenient connections for all ages and abilities, vibrant and walkable neighbourhoods, safe mobility options, lower transportation costs, and healthier communities.

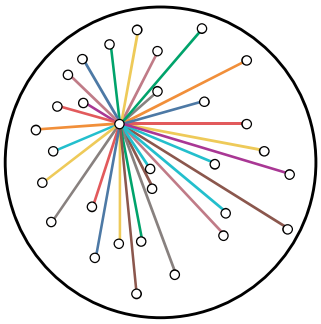


Main mode of Commute by Haligonians

Relevant policy documents

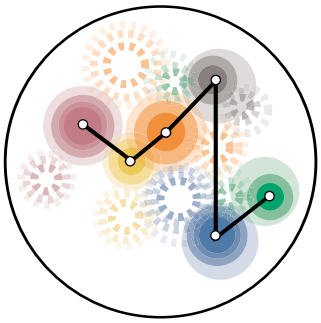
- Choose How You Move: Sustainable Transportation Strategy (2013)
- Regional Municipal Planning Strategy (2014)
- Moving Forward Together (2016)
- Making Connections: 2014-19 Halifax Active Transportation Priorities Plan (2014)
- Integrated Mobility Plan (2017)
- Municipal Design Guidelines (2013)

CONNECTIVITY



The Regional Municipality of Halifax acknowledged connectivity as a system which links people and communities with goods, services and opportunities. A well-integrated mobility system will result in a flexible, barrier-free and enjoyable commute between destinations and across the Regional Centre, suburban and rural areas. The Region has implemented land-use policies that are relevant to connectivity in the Making Connections: 2014-2019 Active Transportation Priorities Plan (2014), and significantly in the Integrated Mobility Plan (IMP) (2017). The IMP has outlined policies to ensure there are provisions for safe and unobstructed routes, highlighting the importance of improving accessibility to accommodate people of all ages and disabilities. Halifax's geographic characteristics are also acknowledged through policy documents. The Region plans to expand active transportation connections in rural areas by connecting communities by facilitating improved links for active transportation across geographical or structural barriers.

INTENSIFICATION



Halifax planned how to facilitate public transit through fostering growth centres as planned for in the Regional Municipal Planning Strategy (2014). The IMP also recognized the need for intensification along corridors and nodes for economic viability of transit. Transit Priority Corridors and transit terminals were identified in the Integrated Mobility Plan as the focal points for density. The City recognized that density would increase around terminals without special planning, however the scale of density required at these sites is critical for transit planning. Transit oriented development has been a priority for Halifax. The Regional Centre is a main priority for transit planning, and is balanced with transit for the Outer Urban area of Halifax.

DESIGN

Halifax's IMP focuses on three major parameters for transit design. The first is a "pedestrian-oriented street design". It is achieved by providing high-quality infrastructure amenities to pedestrians and an enhance sidewalk design to promote residents to take public transit. Pedestrian-oriented site design with human-scale massing is encouraged. The second is the implementation of complete streets for users of all ages and abilities, regardless of their mode of transport. Complete streets are further supported in the policies by creating an emphasis on the public realm to make streets as destinations rather than links to get to a destination (placemaking). The plan also encourages all future development to take the form of Complete communities with opportunities to work, study, shop and play within a comfortable walking distance.

Seattle, Washington

Population (2016): 1,214,839

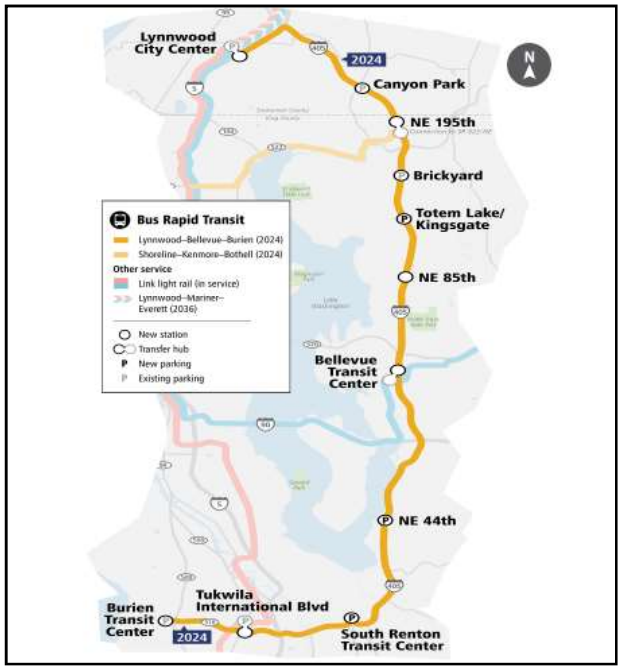


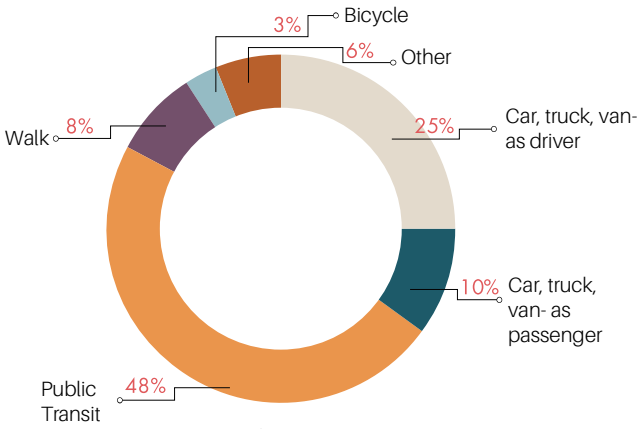
Figure 4.3: Seattle's Bus Rapid Transit network

Ridership (2018-19): 507,000
No. of bus routes: 215
Average trip length: 12.5 Km
Average travel time to work: 27.5 minutes

Seattle's definition of BRT

- Rapid service with buses arriving to stops at least every ten minutes
- Limited number of stops and greater distance between destinations
- Transit signal priority and synchronization of traffic lights with RapidRide bus arrival
- Convenient off-board ORCA payment system

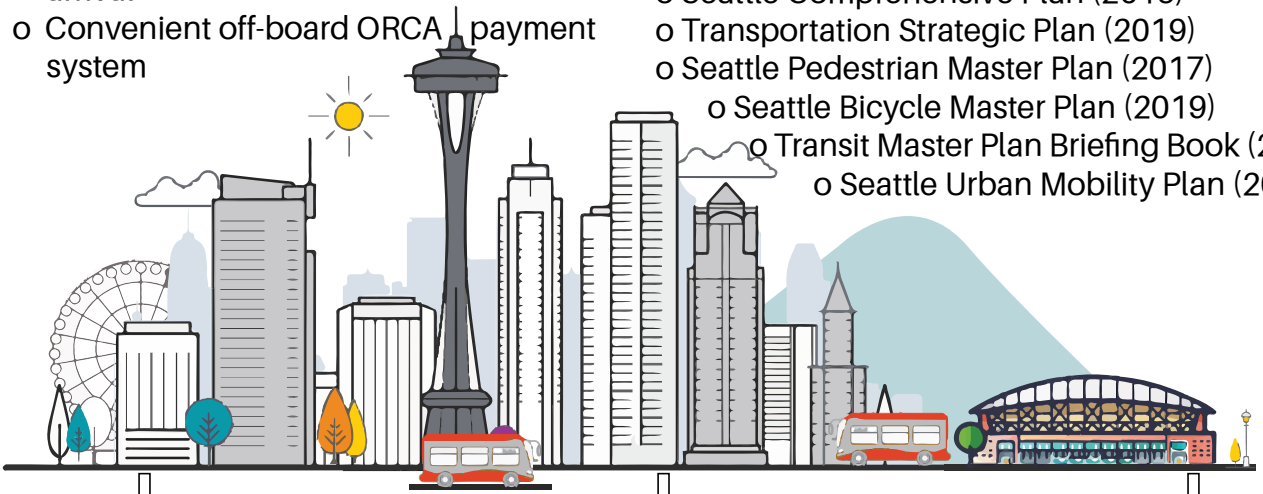
The movement of people from place to place in the Regional Municipality of Halifax has evolved and will continue to evolve over time. The Region aims to enable more people to walk, bicycle, take transit and use other sustainable modes of transportation, however this required rethinking the design of its transportation system and communities. Halifax recognizes the need to create a dense network of streets and reduce the distance between destinations, including employment areas and residences by making it easier and enjoyable to use various modes of transportation. The Region acknowledges multiple benefits associated with active transportation and transit priorities such as, convenient connections for all ages and abilities, vibrant and walkable neighbourhoods, safe mobility options, lower transportation costs, and healthier communities.



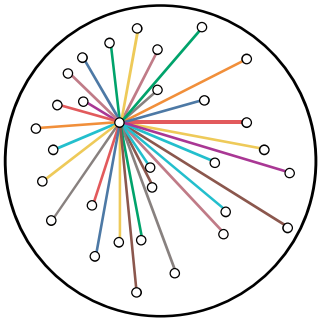
Main mode of Commute by Seattlers

Relevant policy documents

- Transit Master Plan (2016)
- MOVE Seattle 10-Year Strategic Vision for Transportation (2015)
- Seattle Comprehensive Plan (2015)
- Transportation Strategic Plan (2019)
- Seattle Pedestrian Master Plan (2017)
- Seattle Bicycle Master Plan (2019)
- Transit Master Plan Briefing Book (2011)
- Seattle Urban Mobility Plan (2008)

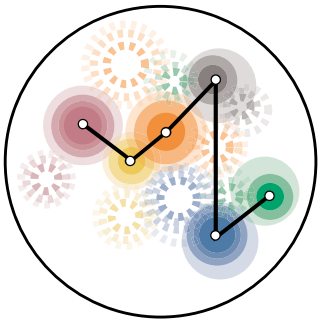


CONNECTIVITY



The City of Seattle has five core values, one of which aims to create an interconnected city. The City notes that providing citizens with more transit options does not always equate to an easy-to-use, interconnected system. Instead, Seattle's goal is to provide an easy-to-use, reliable transportation system that gives residents the options they want when they need them. The City wants to create a coordinated Vision Zero program, build out an all ages and abilities bicycle network, repair critical infrastructure to increase safety, and prioritize pedestrians. These near-term goals directly correlate with the connectivity objectives identified for the purposes of this review, thus demonstrating Seattle's lead in creating optimal land-use policies for connectivity. The city takes on a unique approach to address connectivity by emphasizing the significance of making improvements to wayfinding to enhance pedestrians and cyclists the ability to access transit. Seattle's Transportation Master Plan mentions specific corridors which embody an excellent use of land-use policies which promote intermodal connectivity. For example, the Westlake Center and King Street Station are multimodal hubs which have adequate facilities for transit users and have become great locations for transit-oriented development which have increased transit demand and reduced single-occupant vehicle use.

INTENSIFICATION

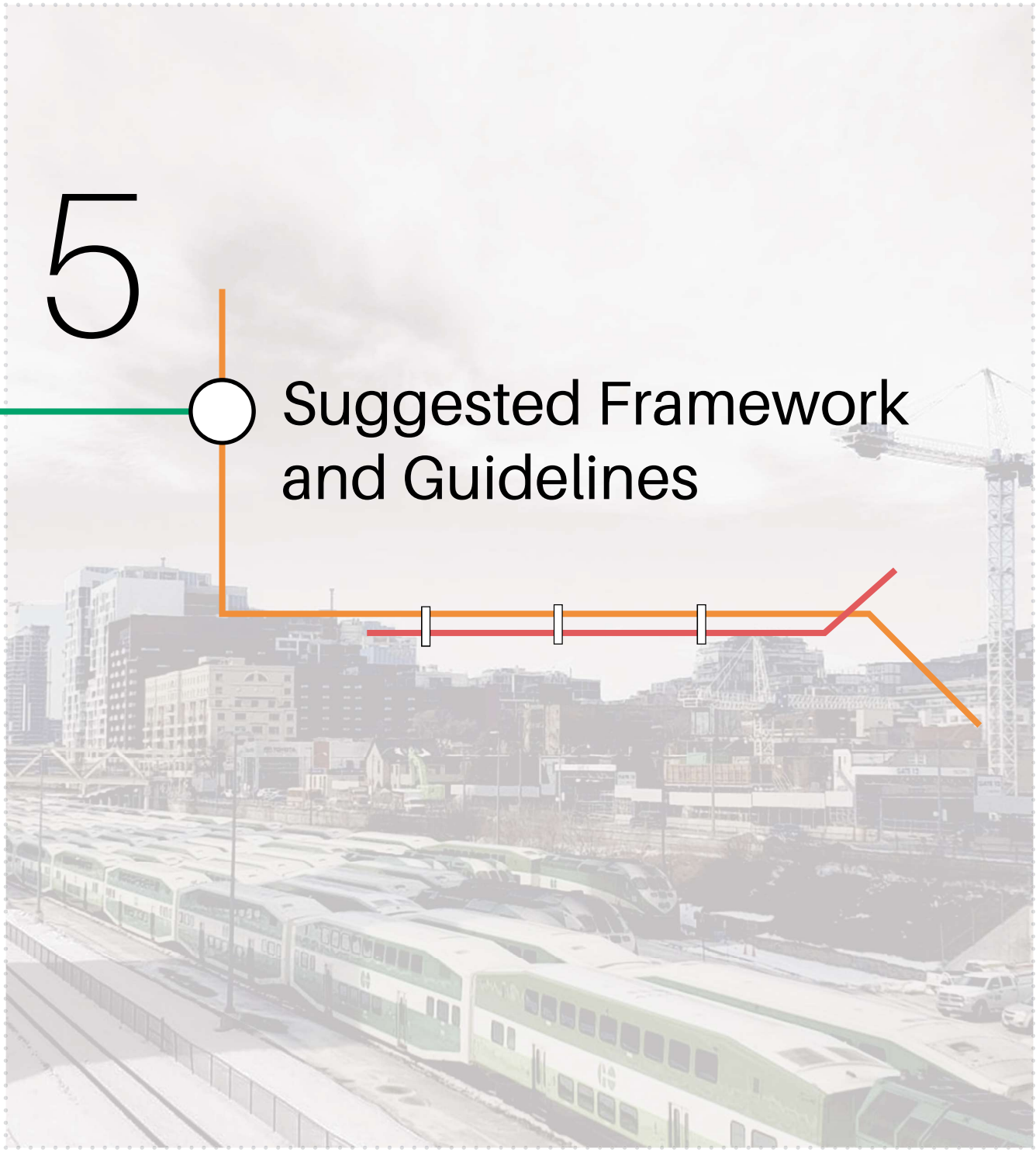


The Seattle Transportation Plan identified corridors that currently carry high ridership presently as well as those with potential new ridership markets for the future. Intensification places an emphasis on employment areas. The City has succeeded in having fewer nodes of employment to focus intensification than in similar cities using land use planning. Along with creating partnerships with employers to offer reduced or free ridership, this has allowed them to access a large and dense ridership market. Overall, Seattle has been able to successfully achieve intensification to support their transit system through their planning documents and policies.

DESIGN

The Seattle Transportation Plan identifies 3 prominent design factors. In its "transit-oriented neighbourhood design", the city identifies the strengthening of the transit nodes, stations and corridors to maximize the value of transit within the neighbourhood. It advocates the need for a transit-supportive urban structure with fine-grained pedestrian and bicycle network that connects to transit. It further emphasizes the need for providing pedestrian gathering spaces like plazas, parks and squares in and around transit areas. In its "Facility (Infrastructure) design" guidelines, the plan focuses on legible wayfinding, passenger information, accessibility, safety and comfort as the top priorities for transit users. In the "Mobility corridor design", the plan highlights modal integration and the importance of context-sensitive complete street design.

5 Suggested Framework and Guidelines



5.1 Purpose of the Guidelines

After completing a desktop review of BRT and Priority Bus services in North America, we identified the following municipalities as having good land use planning policies: Halifax, Nova Scotia; Calgary, Alberta; and, Seattle, Washington. The following guidelines have been developed using findings from the best practices review that was conducted for these municipalities. In this analysis, key land use policies are highlighted that encouraged intensification, connectivity and good design elements along transit corridors within these municipalities. This framework can be used to evaluate land use policies along BRT Corridors and/or Priority Bus Corridors in the Greater Toronto and Hamilton Area, as intensification, connectivity, and effective design elements should be present in land use planning policies when encouraging the use of transit systems. These guidelines can be applied to planning policies at both upper, lower, and single-tier levels of municipal government.

5.2 Guidelines for Intensification

The following intensification guidelines were identified based on information gathered in the best practices review as completed in Section 4. The majority of land use planning policies consisted of objectives relating to density targets, consistent and integrated land use planning objectives, infill redevelopment, focused locations of density, and increased investment in transit infrastructure and service.

1. Infill/Redevelopment

1.1 Establish land uses along transit corridors and around transit stations that encourage the development of mixed-use activity nodes that generate two-way, all-day ridership.

1.2 Redevelopment in these areas should encourage high density developments for both residential and employment uses.

1.3 Establish density policies and guidelines for these areas are independent from municipal or region wide guidelines.

1.4 Ensure that the location and spatial boundaries of infill and redevelopment policies are consistent between upper and lower-tier levels of government to ensure that land use planning objectives are consistent.

Figure 5.1: Schematic sketch showing Infill development.

2. Focus on New Developments and Areas

2.1 Establish density targets within development areas contribute to minimum ridership requirements for the type of transit service recommended for the area.

2.2 New priority areas should focus on implementing high density residential and employment developments that are located within close proximity to transit stations, stops, and transfer points.

2.3 The selection of priority development areas should consider how future and current transit needs will be met after development occurs.

2.4 Prompt and timely investment in the development of new transit lines and improved levels of service to allow market forces to guide development and intensification.

Figure 5.2: Schematic sketch showing new areas of development.

5.3 Guidelines for Connectivity

The objectives identified within the connectivity guidelines included intermodal connectivity, active transportation, integrated with development and provisions for safe and unobstructed routes.

3. Intermodal Connectivity

3.1 Allow for convenient and direct transfer of passengers between buses and BRT stations to other forms of public or active transportation.

3.2 Enhance pedestrian connections with station areas along priority transit corridors and minimize walking distances between intermodal connections.

3.3 Develop design standards and specifications as well as improve wayfinding by enhancing intermodal transfers, pedestrian access to transit and bicycle transfers to transit.

Figure 5.3: Schematic diagram showing differect modes of connectivity. Source: NACTO

4. Active Transportation

4.1 Walking and cycling must be integrated with transit services and improve intermodal opportunities at the community, city and regional level.

4.2 Identify the location of bus stops with a combination of high ridership and barriers (e.g. no sidewalks, dedicated lanes for active transportation) and plan and implement future pedestrian and cycling networks.

4.3 Provide bicycle facilities such as bike racks, and bike sharing to enable seamless transfers between BRT and bicycles.

4.4 Explore the feasibility to include pathways next to existing BRT right-of-way and protected pathways next to future BRT by indicating it in functional and land use plans.

Figure 5.4: Differect modes of Active transportation.

5. Integrated with development

5.1 Work in collaboration with the province and institutions (e.g. hospitals, school boards) to ensure that new public facilities are located within existing or planned transit-oriented development and within a short walk (500 m) to frequent, accessible, transit services.

5.2 Developments located adjacent to BRT stations should seamlessly integrate with these facilities (e.g. entrances to the station, provide shelter, include additional setbacks).

5.3 Encourage all future development to take the form of complete communities with opportunities to work, study, shop, play and obtain personal services within an attractive walking distance of where people live to transit services.

5.4 Establish Primary and Secondary Pedestrian Routes in and around transit stations.

a. Primary routes: Provide easy access and direction to the station.

b. Secondary routes: Provide easy access and direc-tion to primary routes and to buildings and residences.

6. Provisions for safe and unobstructed routes

6.1 Wherever possible, prioritize walking, bicycling and transit when designating road right-of-way space and integrate the needs of people with disabilities into street design.

6.2 Ensure that transit stops and station entrances are clearly visible from the street and pedestrian and bicycle access is direct and convenient.

6.3 Facilitate connections across natural barriers (e.g. rivers, undulating landscape) to allow for expansion of "travel radius" around stations which will reduce travel time for those residing in fragmented communities.

a. Engage with communities to gain local input on routes that have barriers to access to transit stations.

6.4 Minimize the likelihood of serious injuries and fatalities in and around transportation facilities by taking a "Towards Zero" (zero injuries and fatalities) approach.

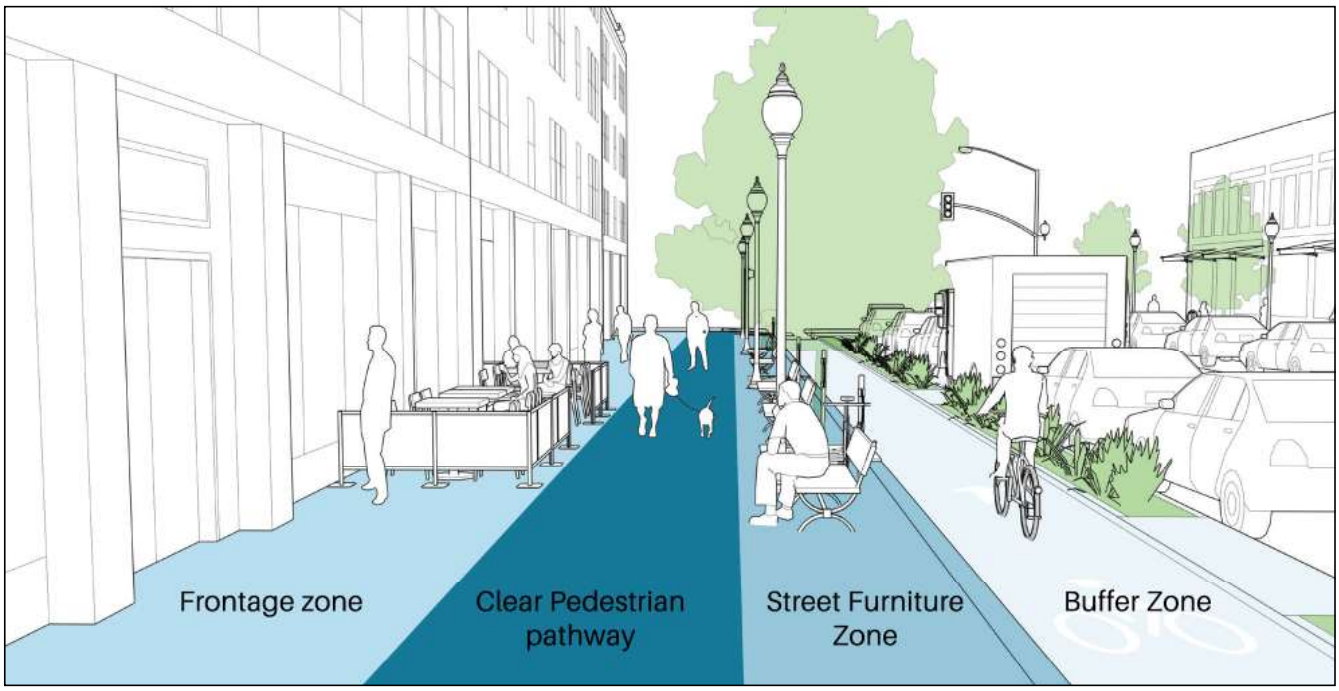


Figure 5.5: Schematic sketch showing pedestrian-oriented street design. Source: NACTO

5.4 Guidelines for Design

The suggested guidelines for design focuses on pedestrian-oriented street design, Complete Streets, Optimization of transit infrastructure, provide a mix of land uses around transit corridors and human-scale face development along these corridors.

7. Pedestrian street design

7.1 Pedestrian walking distance to transit stops should be minimized to 400m or less.

7.2 Provide a fine-grained mix of pedestrian and bicycle network that connects transit services.

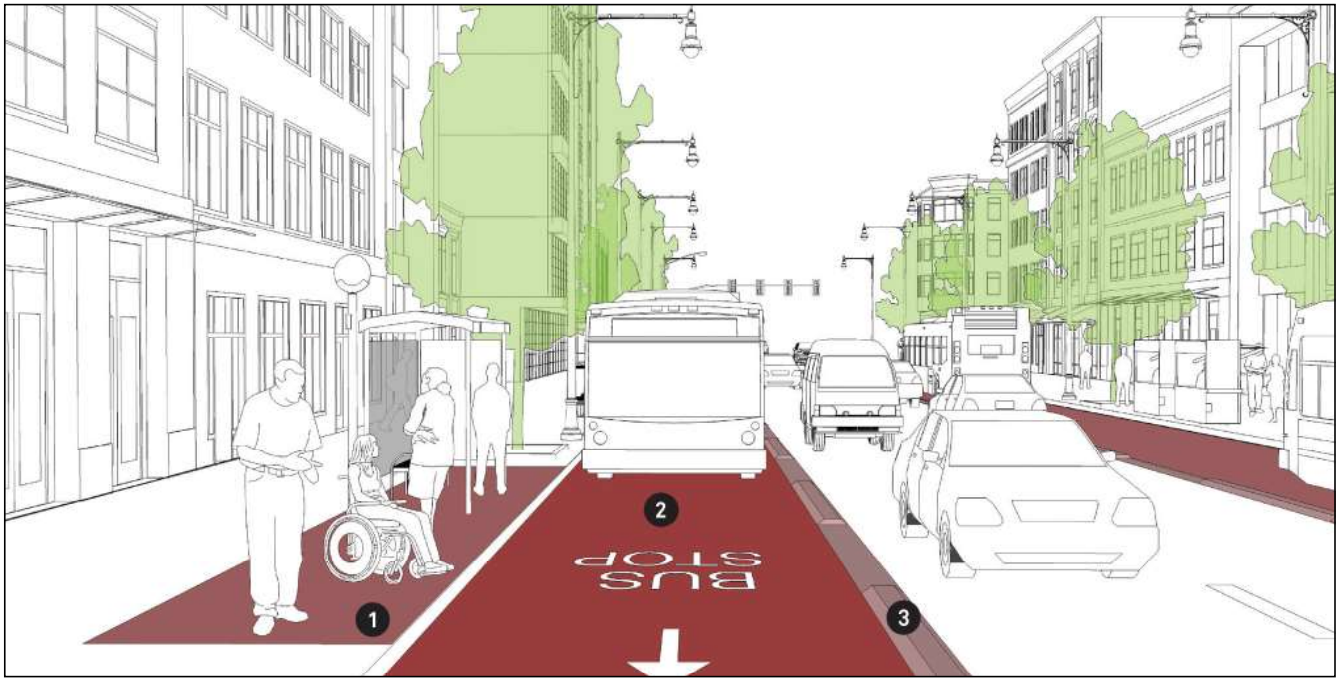
7.3 Pedestrians must be given the highest priority in corridor space allocation to maintain an attractive public realm that connects to transit services.

7.4 Improve streetscape design by providing safe and barrier-free walkways and pathways to encourage pedestrians.

Figure 5.6: Schematic diagram of pedestrian-oriented street design. Source: NACTO

7.5 The street design should reflect a healthy environment for walking as this will influence the pedestrian's choice to use transit.

7.6 Provide safe, clean and comfortable infrastructure to ensure ease of transfer between transit services and other modes of transportation.



Transit Stop or Stop Zone Transit Running Way Buffer Zone Motor way

Figure 5.7: Schematic diagram showing Transit-oriented complete street design. Source: NACTO

8. Complete Streets

8.1 Streets must be designed to be equitable and inclusive, serving the needs and functions of diverse users regardless of age, abilities and mode of transport.

8.2 Provide a healthy balance between mobility services, green infrastructure and public realm.

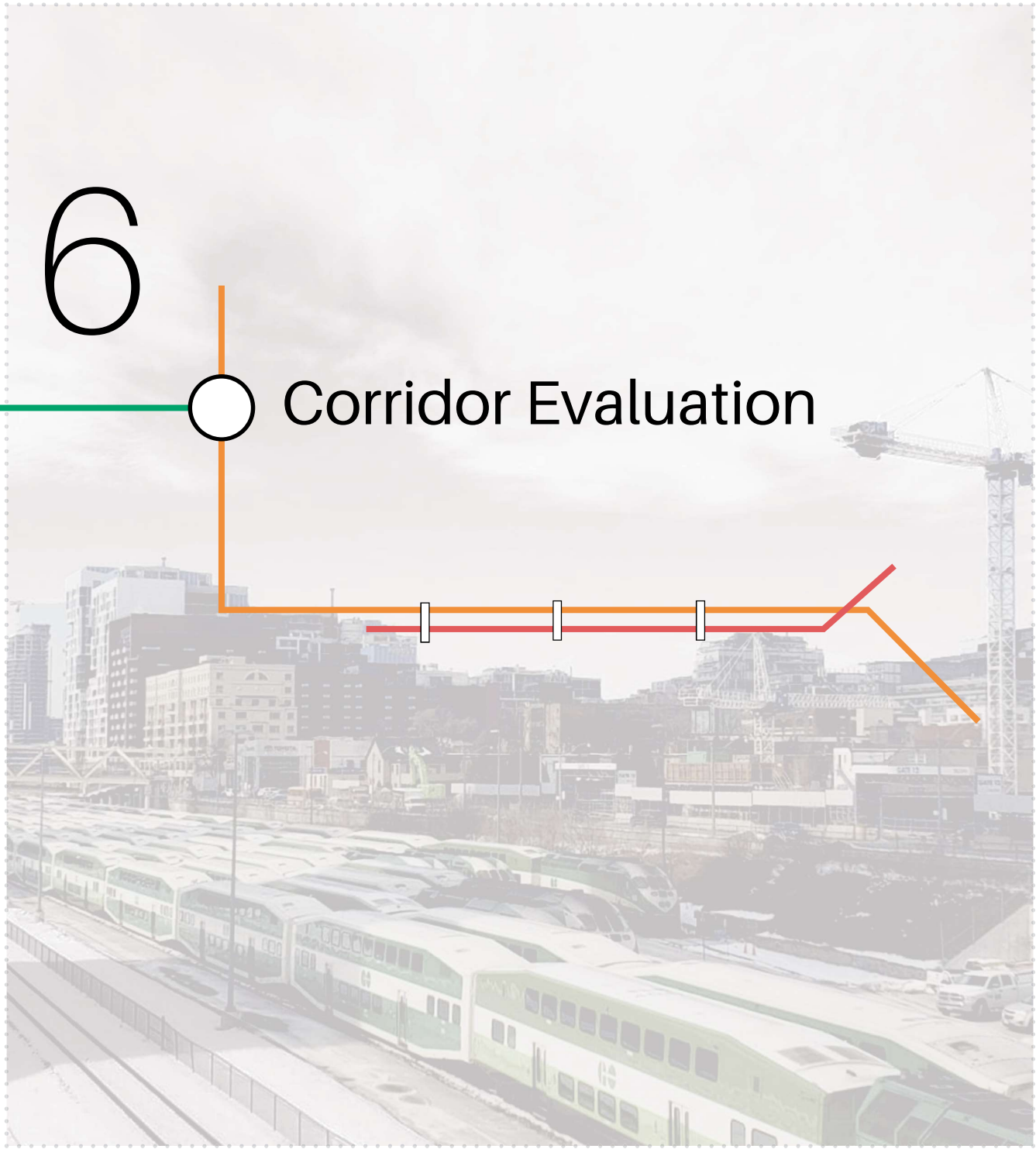
8.3 Complete street must focus on 'walkability' and 'bikeability' as its main components.

8.4 Provide gathering spaces that encourage pedestrians to linger on the streets making streets a destination.

8.5 Provide a wide range of seating types.

8.6 Have legible wayfinding and passenger Information that is highly accessible.

6 Corridor Evaluation



6.1 Corridor Selection

The client suggested the following corridors for evaluation: Highway 7, Vaughan, Durham, and Dundas. After consideration, Highway 7 West Bus Rapid Transit corridor located in York Region was selected for further analysis. Refer to Figure 6.1 for further information. This corridor was selected for analysis for the following reasons:

Land use policies adjacent to and in close proximity to rapid transit corridors should reflect the fact that specific and guided land uses are needed in order to support system objectives and ridership requirements. The Highway 7 West Bus Rapid Transit corridor is one of five BRT or Priority Bus corridors currently under construction within the Greater Toronto and Hamilton Area. Assessing a corridor that is currently under construction, rather than one that is planned, ensures that policies are implemented in advance of system operation.

There are land use planning policies from official plans that are in-effect and not under-review for both upper and lower-tier municipalities.

A section of the Corridor has been completed, which means land use planning impacts may be more apparent.

The corridor was within a municipal jurisdiction allowing for more straight forward analysis.

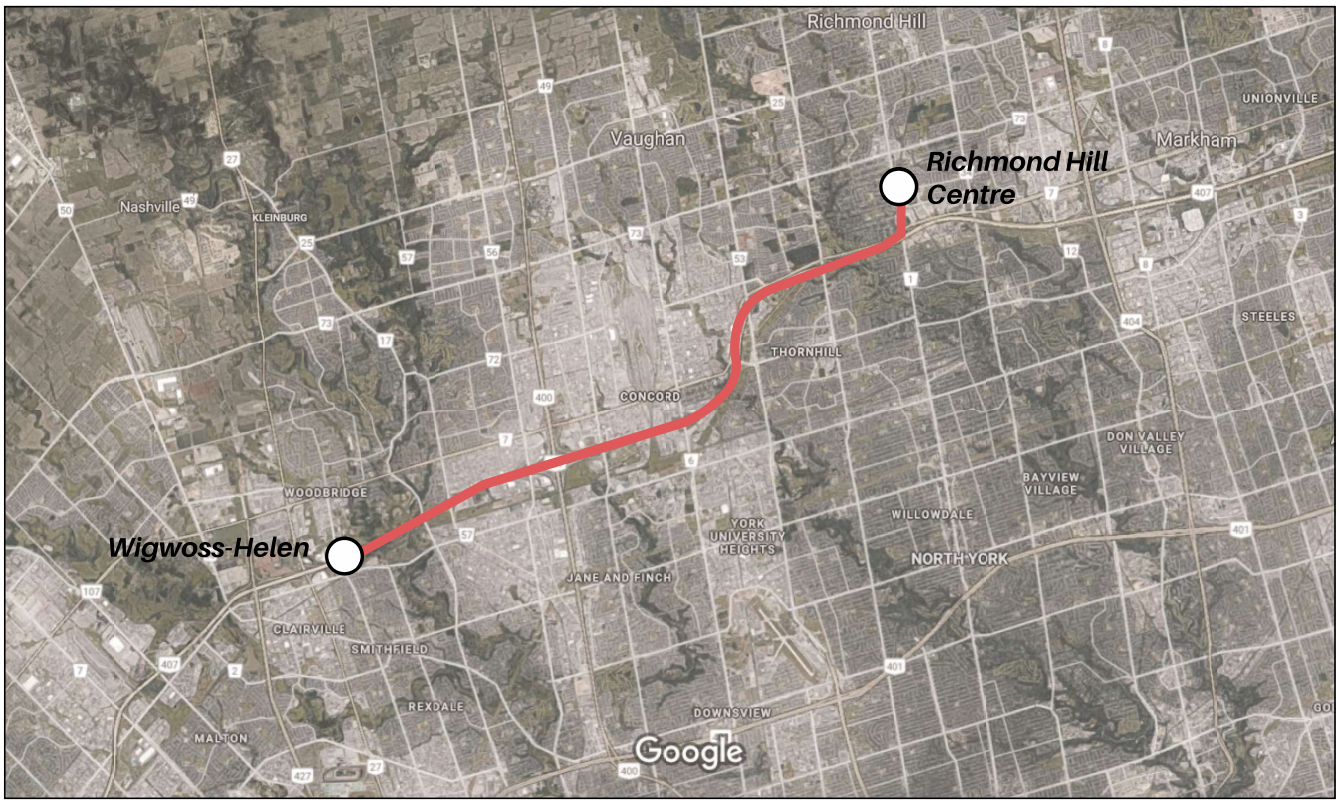


Figure 6.1: Map showing the extents of the chosen corridor for evaluation along Highway 7 West

6.2 Corridor Description

The Highway 7 West Bus Rapid Transit corridor is the latest section of rapidway construction which began in the fall of 2016. The rapidway consists of bus lanes located in the median of Highway 7, and extends from Bruce Street to Edgeley Boulevard, and from Centre Street to Yonge Street via the existing Viva route along Centre and Bathurst. The rapidway is scheduled to open for service by the end of 2019 and consists of 9 stops. The corridor also complements previous rapidway construction which also took place on Highway 7 between Edgeley Boulevard and Bowes Road, consisting of 3 stops . The entire Highway 7 rapidway and all stops within the corridor are at-grade.

6.3 Corridor Evaluation

6.3.1 Documents Reviewed for Evaluation

The following documents were reviewed for the evaluation:
York Region Documents:

- York Region Official Plan
- York Region Transportation Master Plan (TMP)
- York Region Pedestrian and Cycling Master Plan (PCMP)
- York Region Rapid Transit Corporation 2018 -2028 Business Plan

City of Vaughan Documents

- Vaughan Official Plan
- Vaughan City-Wide Urban Design Guidelines
- Vaughan Pedestrian and Bicycle Master Plan (currently under review)
- Vaughan Transportation Master Plan (currently under review)
- Vaughan Metropolitan Center Secondary Plan

6.3.2 Intensification

Suggested Guidelines	Strengths	Weaknesses
1. Infill Development		
1.1 Establish land uses along transit corridors and around transit stations that encourage the development of mixed-use activity nodes that generate two-way, all-day ridership.	Section 2.1.3.2 of City of Vaughan Official Plan states that identifying a hierarchy of mixed-use centers to be developed at appropriate densities to support transit service is needed. Section 2.2.1.1 further states that the Vaughan Metropolitan Centre and Primary Centers will be mixed use, and the area along the Primary Intensification Corridor will have a mix of uses. Section 2.2.5 outlines Intensification Areas in Vaughan and the hierarchy of mixed-use centers and corridors – Vaughan Metropolitan Centre is primary area for mixed use development, with the Regional Intensification Corridor being second. Section 5.1.2.2 states that retail activities and major offices should be directed to Intensification Areas as these areas are better served by transit and help create mixed-use centers and corridors Schedule 13 shows a variety of land use designations including Community-Commercial Mixed-Use, Employment Commercial Mixed-Use, Mid-Rise Mixed-Use, and High-Rise Mixed-Use	Station areas not identified in both the York Region Official Plan or the City of Vaughan Official Plan Only two Primary Centers and one Local Centre present along the corridor – additionally, one of these Primary Centers is located directly to the east of the Vaughan Metropolitan Centre Large portions of land that have frontage to the corridor designated as either Low-Rise Residential or General Employment Corridor wide planning guidelines are in place as evidenced by the Regional Intensification Corridor designation, but mixed-use land use designations and secondary plans which contain these mixed-use designations only in-effect along half of the corridor. Need to be more specific to encourage and target infill developments around stations. This is because these areas will inherently have the highest level of accessibility and redevelopment potential.

Suggested Guidelines	Strengths	Weaknesses
1.2 Redevelopment policies in these areas should encourage high density developments for both residential and employment uses. *1.3 Establish density policies and guidelines for these areas that are independent from municipal or region wide guidelines.*	City of Vaughan Official Plan Goal 8 – states that shift in emphasis from development of new communities in greenfields to the promotion of intensification in areas of the City with infrastructure capacity and existing or planning transit service to accommodate growth (pg. 14) York Region Official Plan 5.4.28 designates all land front facing the corridor as a Regional Corridor City of Vaughan Official Plan 2.2.1 designates all areas front racing the corridor as Regional Intensification Corridors, which are designated as Intensification Areas per section 2.2.1.2 Additional parcels of land adjacent to or in close proximity to corridor designated as Primary Centers, Local Centers, or Vaughan Metropolitan Centre under section 2.2.1.1, and per section 2.2.1.2 are subject to intensification guidelines Intensification guidelines outlined under section Section 2.2.5 states that development within the city is prioritized for areas along the Regional Intensification Corridor. Also states that these areas have been established to make efficient use of underutilized space, meaning that infill development should occur. Vaughan Metropolitan Centre Secondary Plan – section 8.1 requires redevelopment and intensification to occur within the area, including retail and housing uses, and that these developments will have higher densities compared to city-wide policies.	Goal 8 in the City of Vaughan Official Plan states that 45% of new residential growth is to be accommodated through intensification in Intensification Areas, while section 2.2.5 further states that the majority of these intensification efforts will occur along the Regional Intensification Corridor. The goal is not specific, as a proportion of new residential development, rather than a specific minimum density goal, has been established. Additionally, no mention of minimum density goals / settlement objectives in relation to employment uses – simply states that employment growth is being accommodated through the provision of mixed-use land use designations along the Regional Intensification Corridor. Per section 10.1.1.4, detailed planning policy aspects (such as minimum density targets) not yet implemented.

Suggested Guidelines	Strengths	Weaknesses
	Section 2.2.5.11 states that the Regional Intensification Corridor is considered to be a Key Development Area, and is subjected to detailed planning policies per section 10.1.1.4 that addresses minimum density requirements and targets.	
1.4 Ensure that the location and spatial boundaries of infill and redevelopment policies are consistent between upper and lower-tier levels of government to ensure that land use planning objectives are consistent.	York Region Official Plan 5.4.28 designates all land front facing the corridor as a Regional Corridor City of Vaughan Official Plan 2.2.1 designates all areas front racing the corridor as Regional Intensification Corridors, which are designated as Intensification Areas per section 2.2.1.2 Boundaries of Regional Corridor and Regional Intensification Corridor are identical in regional and municipal official plans	Regional Intensification Corridor not mentioned in additional planning documents, such as the City of Vaughan's Transportation Master Plan Could be disconnect between land use planning officials and transportation planning officials, which should not be the case as both sectors as inherently related
2. New developments and Areas		
2.1 Establish density targets within new developments that contribute to minimum ridership requirements for the type of transit service recommended for the area.	Corridor has been developed through urban area and does not pass through any new development areas in the City of Vaughan. Therefore, minimum ridership requirements in new developments is not applicable as there are no new developments.	N/A
2.2 New priority areas should focus on implementing high density residential and employment developments that are located within close proximity to transit stations, stops, and transfer points.	City of Vaughan Official Plan identifies priority areas via the establishment of Primary Centers and Local Centers under section 2.2.1.1, and per section 2.2.1.2 are subject to intensification guidelines	Location of stops not yet identified in planning policies - need more high density destinations to be established, either by Primary Center or Local Center designations, but hard to do so without the location of stops being specified.

Suggested Guidelines	Strengths	Weaknesses
	Intensification guidelines outlined under section 2.2.5 states that development within the city is prioritized for areas along the Regional Intensification Corridor. Also states that these areas have been established to make efficient use of underutilized space, meaning that infill development should occur Vaughan Metropolitan Centre Secondary Plan – section 8.1 requires redevelopment and intensification to occur within the area, including retail and housing uses, and that these developments will have higher densities compared to city-wide policies Section 2.2.5.11 states that the Regional Intensification Corridor is considered to be a Key Development Area, and is subjected to detailed planning policies per section 10.1.1.4 that addresses minimum density requirements and targets.	Section 10.2.2 states that properties that are rear-lotted against a Regional Intensification Corridor, or those that have frontage on a window street parallel to a Regional Intensification Corridor, are generally not considered appropriate for intensification and the Key Development Area policies do not apply. Schedule 1 in City of Vaughan Official Plan shows that only three priority areas identified, as only two Primary Centers and one Local Centre identified along the corridor.
2.3 The selection of priority development areas should consider how future and current transit needs will be met after development occurs.	Section 4.3.1 states that a YRT/Viva Ridership Growth Strategy will be developed, which summarizes how transit needs within the Highway 7 corridor will be addressed over the next 5 years. This will highlight aspects such as transit ridership and resident needs, land use and transit integration, and a recommendations and investment opportunities to increase service levels in order to improve service reliability and reduce passenger waiting times.	Outside of the Vaughan Metropolitan Center secondary plan area, no rationale within the City of Vaughan Official Plan regarding the establishment of Primary Centers and Local Centre along corridor. Further collaboration between City of Vaughan

Suggested Guidelines	Strengths	Weaknesses
2.4 Prompt and timely investment in the development of new transit lines and improved levels of service to allow market forces to guide development and intensification.	Other than bonusing for increases in height or density as mentioned in section 10.1.2.9 in the City of Vaughan's Official Plan, the main policies used to increase density and intensification in the identified priority areas are the provision of transit itself.	Per section 10.1.2.14, the adoption of a Community Improvement Plan for specific areas along the Regional Intensification Corridor, such as the Vaughan Metropolitan Area secondary plan area, would allow for the transfer of grants or funds to property owners or developers if densities that are too low to support planned transit facilities exists. The adoption of a Community Improvement Plan is also considered in section 10.7 of the Vaughan Metropolitan Area Secondary Plan Removes incentive for developers to propose high density developments if financial incentives are a possibility

6.3.3 Connectivity

Suggested Guidelines	Strengths	Weaknesses
3. Intermodal Connectivity		
3.1 Allow for convenient and direct transfer of passengers between buses and BRT Stations to other forms of public or active transportation.	York Region Official Plan Active Transportation Policy 7.2.4. Regional PCMP – Exhibit 3-1 Infill corridors and Capital Road Projects for proposed Cycling facilities intersect with the corridor. Region PCMP – Exhibit 3-1 Separated Bike Lane Project on Corridor. Vaughan Official Plan Street Network Policies 4.2.11 and 4.2.15 promote integration and continuous street network. Vaughan Official Plan Public Realm Policy 9.1.1.4 promotes grid-like street patterns for walkable and cyclable streets.	N/A
3.2 Enhance pedestrian connections with station areas along priority transit corridors and minimize walking distances between intermodal connections	York Region Official Plan Policies 5.2.10, 5.4.6, 5.4.15 (c), 5.3.30, 5.4.31 and 5.6.5 require direct pedestrian connections to transit stations on Regional Corridors and seek to minimize walking distances. Vaughan Official Plan Policies 4.2.2.17 and 9.2.2.14 encourage complete networks and facilities for cycling and walking to transit stations, as well as minimizing walking distances to stations.	N/A

Suggested Guidelines	Strengths	Weaknesses
3.3 Develop design standards and specifications and improve wayfinding by enhancing intermodal transfers, pedestrian access to transit and bicycle transfers to transit.	Vaughan Official Plan Policy 9.1.1.12 promoted pedestrian safety using the Crime Prevention Through Environmental Design Guidelines. Vaughan Urban Design Guidelines set out performance standards for signs and wayfinding. York Region Pedestrian and Bike Master Plan Networks Improvement Strategy encourages pedestrian safety through consistent design for pavement markings and wayfinding. York Region Transportation Master Plan "First and Last Mile Connections Strategy" encourages placements of maps at stations for major destinations, as well as cycling and walking routes.	N/A
4. Active Transportation		
4.1 Walking and Cycling must be integrated with transit services and improve intermodal opportunities at the community, city and regional level.	Vaughan Official Plan Policies 4.2.2.17, 4.2.3.11, 4.1.11 and 4.1.16 encourage intermodal opportunities through comprehensive networks and bike infrastructure (i.e., bike racks and storage) to be placed at stations as well as on buses. Highway 7 West is one of the corridors marked for protected bike lane projects in the Region to be complete by the end of 2020.	N/A

Suggested Guidelines	Strengths	Weaknesses
4.2 Identify the location of bus stops with the combination of high ridership and barriers (e.g., no sidewalks, dedicated lanes for active transportation) and plan to implement future pedestrian and cycling networks.	Vaughan OP 9.1.1.11 call for universal physical access of the public realm and promotes the implementation of supportive infrastructure for those with visual and hearing impairments, this includes textured paving and audible crosswalks. The York Region TMP seeks to increase sidewalks and trails, as well as ensuring they are maintained to make active transportation "attractive". The York Region TMP also encourages creating complete streets and the Grid Partnerships as ways to overcome natural and built-form barriers to active transportation.	Vaughan Policy documents did not identify barriers to active transportation, or policies to help overcome barriers.
4.3 Provide bicycle facilities such as bike racks, and bike sharing to enable seamless transfers between BRT and bicycles.	York Region Official Plan Policy 4.2.3.11 and 7.2.11 encourages the implementation of bicycle racks and storage at stops and stations, as well as on buses. York Region TMP First and Last Mile Connections Strategy encourages bike channels on stairs in stations, as well as bike sharing services.	N/A
4.4 Explore the feasibility to include pathways next to existing BRT rights-of-way and protect pathways next to future BRT by indicating it in functional and land use plan	York Region Official Plan Active Transportation Policy 7.2.7 requires local municipalities to work with the Region to coordinate existing infrastructure within Regional rights-of-way to include sidewalks and cycling facilities. Vaughan Official Plan Arterial Streets Policy 4.2.1.17 requires arterial streets to be designed to accommodate all forms of transit. The Highway 7 West Corridor is classified as Separated Bike Facilities in the Region's PCMP and is one of the of the protected bike lanes projects in the Region.	N/A

Suggested Guidelines	Strengths	Weaknesses
5. Integrated with Development		
5.1 Work in collaboration with the province and institutions (e.g., hospitals, school boards) to ensure that new public facilities are located within existing or planned transit-oriented development areas and within a short walk (500 meters) to frequent, accessible transit services. (A Place to Grow Requires 800 meters walking distance.)	York Region Official Plan Policy requires the walking distance to transit stops in urban areas to be 500 meters for 90 per cent of residents and 200 meters for 50 per cent of residents.	No indication of policy to promote collaboration with institutions to ensure new public facilities are located within walking distance of transit routes
5.2 Developments located Adjacent to BRT stations should seamlessly integrate with these facilities (e.g., entrances to the station, provide shelter, include additional setbacks).	Vaughan Official Plan Policy 9.1.2.7, although not specifically for transit corridors encourages new developments to: front the public street; make entrances clear and directly accessible from the sidewalk; and, provide active ground floor uses and to avoid blank facades. Vaughan Urban Design Guidelines - Performance Design Guidelines 5.3.1, 5.3.8 and 5.3.9 set recommendations to integrate building fronts and entrances to the street and discourage blank facades.	N/A
5.3 Encourage all future development to take the form of complete communities with opportunities to work, shop, play and obtain personal services within an attractive walking distance of where people live to transit services.	York Region TMP Complete Communities Strategy supports the implementation of complete communities through mixed-use and high-density developments that support short trips. York Region Official Plan Policy 5.2.6 encourages development to incorporate live-work opportunities to create sustainable cities and communities.	N/A

Suggested Guidelines	Strengths	Weaknesses
5.4 Establish Primary and Secondary Pedestrian Routes. Primary Routes: Provide easy access and direction to the station. Secondary Routes: provide easy access and direction to primary routes, buildings and residences.		No policies were identified in the evaluation that specified primary and secondary routes.
6. Provisions for safe and unobstructed routes		
6.1 Whenever possible, prioritize walking bicycling and transit when designating road right-of-way space and integrate the needs of people with disabilities into street design.	York Region PCMP classifies the Highway 7 West Corridor as Separated Network Facility for cyclists to improve comfort and safety. The York Region PCMP Network Improvements Strategy for Integrating Active Transportation seeks to increase safety for pedestrians and cyclists through consistent design of pavement markings and wayfinding, as well as consider crossing times at controlled intersections. Vaughan Official Plan Policy 4.2.1.12 prioritizes safe and efficient pedestrians and cyclists by creating transit friendly street cross-sections	N/A
6.2 Ensure that transit stops and station entrances are clearly visible from the street and pedestrian access is direct and convenient.	Policies at the Regional and Local level both encourage the placement of bike infrastructure such as bike racks and storage at stations and on buses. Vaughan's Urban Design Guidelines 5.3.1, 5.3.8 and 5.3.9 provide guidance for active street frontage and easy to access entrances to buildings.	The evaluation did not identity policies that applied specifically to transit stops and stations.

Suggested Guidelines	Strengths	Weaknesses
6.3 Facilitate connections across natural barriers to allow for expansion of "travel radius" around stations which will reduce travel time for those residing in fragmented communities. Engage with communities to gain local input on routes that have barriers to access to transit stations.	York Official Plan Active Transportation Policy 7.2.6 sets out that local municipalities should partner with other stakeholders to implement pedestrian and cycling programs.	N/A
6.4 Minimize the likelihood of serious injuries and fatalities in and around transportation facilities by taking a "Towards Zero" (zero injuries and fatalities) approach.	York Region PCMP classified the Highway 7 West Corridor as Separated Network Facility which will help to increase safety for cyclists. York Region Official Plan Policies 7.2.27 and 7.2.28 encourage working with local municipalities to provide street lighting along Regional streets serviced by transit. Vaughan Official Plan Policies 5.2.12 and 4.2.1.16 encourage the implementation of transit-friendly street cross-sections reduced daylight triangles and reduced curb radii requirements.	Although a Towards Zero Approach was not specified, there are policies in place to increase the safety of those who use transit and active transportation.

6.3.4 Design

Suggested Guidelines	Strengths	Weaknesses
7. Pedestrian-oriented street design		
7.1 Pedestrian walking distance to transit stops must be minimized to 400 meters or less	York Region Official Plan Policy 7.2.25 sets out the Region will provide transit within 500 meters of 90 per cent of resident in Urban Areas, and 200 meters of 50 per cent of residents in Urban Areas	No specifications for walking distances in policy at the Local level.
7.2 Provide a fine-grained mix of pedestrian and bicycle network that connects transit services.	York Official Plan Policies 5.2.15 and 7.2.11 promote the creation of direct connections for pedestrians to transit stations, as well as providing bicycle racks and storage at stations and on buses to help integrated cycling activities. York Regions TMP First and Last Mile Connections Strategy encourages putting bike channels on transit station staircases and bike sharing services to promote bike use. Vaughan Official Plan Policies 4.2.3.11 and 4.1.1.6 promote bicycle use to and from transit stations through creating a comprehensive network of on- and off-street routes, as well as supportive bicycle infrastructure at stops and stations.	N/A
7.3 Pedestrians must be given the highest priority in corridor space allocation to maintain an attractive public realm that connects to transit services.	Vaughan Official Plan Policy 4.2.1.2 prioritizes safe and efficient pedestrian transit through the creation of pedestrian and transit-friendly street cross-sections. Vaughan Official Plan Policy 9.1.1.12 promotes design that considers pedestrian safety through the City's Crime Prevention Through Environmental Design Guidelines.	N/A

Suggested Guidelines	Strengths	Weaknesses
7.4 Improve streetscape design by providing safe and barrier-free walkways and pathways to encourage pedestrians.	York Region TMP First and Last Connections Strategy encourages maps at stations for the surrounding area showing walking and cycling routes, as well as major destinations. York Region PBMP Networks Improvements Strategy sets out safety improvements through consistent design of pavement markings and connecting pedestrians with traffic signals.	N/A
7.5 The street design should reflect a healthy environment for walking as this will influence the pedestrian's choice to use transit.	Vaughan Official Plan Policy 9.1.2.7, although not specifically for transit corridors, requires new developments to: front the public street; locate entrances so they are visible and accessible from the sidewalk; and, provide active ground floor uses and avoid blank facades. Vaughan's Urban Design Guidelines 5.3.1, 5.2.8 and 5.3.9 set out recommendations for creating pedestrian friendly environments, active street fronts, and discourages blank facades.	N/A
7.6 Provide safe, clean and comfortable infrastructure to ensure ease of transfer between transit services and other modes of transportation.	Vaughan Official Plan Policies 9.1.1.12 and 9.1.1.3 encourage pedestrian safety through design for crime prevention and providing a zone between pedestrians and vehicular traffic. This zone can be created with landscaping or street furniture. Vaughan Official Plan Policy 4.2.1.16 requires the municipality to work with the region to create pedestrian and transit friendly street cross-sections. This can be done through reducing daylight triangle and curb radii.	N/A

Suggested Guidelines	Strengths	Weaknesses
	York Regions PBMP promotes safety for pedestrians through consistent design and connecting pedestrians with traffic signals. York Official Plan Policy 3.1.3 requires high quality design to create pedestrian friendly community that is safe and comfortable to ensure residents can meet their daily needs through walking.	N/A
8. Complete streets		
8.1 Streets must be designed to be equitable and inclusive, serving the needs and functions of diverse users regardless of age, ability and mode of transport.	Vaughan Official Plan Policy 9.1.1.11 requires universal access through the public realm and public spaces to universally accessible. This policy supports the implementation of supportive infrastructure such as textured paving and audible sidewalls for those who are hearing or visually impaired.	N/A
8.2 Provide a healthy balance between mobility services, green infrastructure and public realm.	Vaughan Official Plan Policy 9.1.1.2 sets out that streets and rights-or-way are significant public spaces and their design should balance their multiple roles. They should contribute to greening the City though the provision of street trees and landscaping and create gathering places through pedestrian amenities, street furniture and lighting. Vaughan's Urban Design Guideline 5.3.1 and 6.1.1 encourages the Green Approach to building frontage and façade design. This approach helps to create a pedestrian friendly environment, increases tree canopy and enhance the City's natural system.	N/A
8.3 Complete street focus on walkability and cycling as its main components.	Vaughan Official Plan Policy 9.1.1.4 promotes and interconnected grid pattern of streets and blocks to promote walking and cycling.	N/A

Suggested Guidelines	Strengths	Weaknesses
8.4 Provide gathering spaces that encourage pedestrians to linger on the streets making them a destination.	Vaughan Official Plan Policy 9.1.1.2 promotes streets and significant public spaces and implementing street furniture and lighting to allow create gathering spaces. York Official Plan Policy 5.4.6 requires secondary plans to be created for Regional Corridors which shall include provisions for urban public realm through the provision of: passive or active park space; meeting places; and, urban squares.	N/A
8.5 Provide a wide range of seating types.	Vaughan Official Plan Policy 9.1.1.3 seeks to improve the pedestrian experience on public streets and rights-of-way by providing a zone between pedestrians and high levels of traffic through landscaping and street furniture. Vaughan Urban Design Guideline 5.2.12 sets of recommendations for street furnishings, including that benches, lighting and waste receptacles should be clustered. This guideline also recommends that when multiple furnishings are being provided, they should come from the same family or from the City's standard furnishings.	N/A
8.6 Have legible wayfinding and passenger information that is highly accessible.	York Region's TMP First and Last Mile Connection Strategy encourages maps at stations showing major destinations and routes in the surrounding area. Vaughan's Urban Design Guideline 5.2.13 sets out recommendations for signage and wayfinding.	N/A

6.3.5 Barriers

The main barriers preventing intensification from occurring are physical barriers that are present throughout the urban environment. For example, the presence of the Concord rail yard suits freight traffic and associated industries, but does not supported a dense mixed use environment. Additionally, the presence of major highways, such as Hwy. 400 & 407, provide challenges for connected land uses as they often fragmented and become defined by these man-made boundaries. Further work needs to be done to ensure that these barriers do not define the urban landscape in which the Highway 7 West BRT corridor is located in close proximity too.

7 Recommendations and Future Research

7.1 Opportunities and Recommendations

Land use policies from the upper- and lower- tiers should be consistent. The Vaughan Pedestrian and Cycling and Master Plan and the Transportation Master Plan are both under review and will be updated, and this will help to ensure that they are consistent with York Regions land use policies. It is important to ensure that there is two-way movement along the corridor all day, and this can be achieved by identifying station locations and implementing supportive land use policies accordingly. Lands in close proximity to the corridor should not be ignored. There are large areas of land around the Highway 7 West Corridor that are currently zoned as employment lands with no redevelopment or intensification development. Development along the corridor should be a top priority, but there should also be a focus on the areas in close proximity for development and increased density to support the corridor. This can be achieved through implementing the appropriate land use planning policies to connect Centres in the surrounding areas to the Corridor. Collaboration with the public and institutions is important to identify barriers to access and use of transit services as well as active transportation. The review process for the Vaughan Pedestrian and Cycling and Transportation Master Plans involve stakeholder engagement that will aid in this collaboration. Integrating transit stops and stations into street design and making their entrances clear and accessible is important to promoting transit use and active transportation. This can be achieved through Implementing policy and design guidelines for transit stops and stations.

7.2 Future Research

We suggest the following tasks for future research:

- Examine US, international and Canadian municipalities that were not reviewed in this project for the best practices review.
- Examine US and international examples using the same methodology and consult with municipalities with an ex ante approach.
- Consult with municipalities that have BRT and Priority Bus Corridor systems when creating guidelines because there may be unique aspects that each municipality may need to consider while implementing policies and guidelines (i.e. natural barriers that may influence intermodal connectivity).
- Conduct a similar corridor evaluation for remaining corridors that are in-delivery per the 2041 RTP.
- Monitor the municipalities identified in the best practices review to determine if its policies are effective after implementation - this is a long-term research objective.

Appendix A - Policy Context Listed Policies

Provincial Policy Statement

PPS Section 1.6

1.6.7.1 Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.
1.6.7.2 Efficient use shall be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.
1.6.7.3 As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained and, where possible, improved including connections which cross jurisdictional boundaries.
1.6.7.4 A land use pattern, density and mix of uses should be promoted that minimize the length and number of vehicle trips and support current and future use of transit and active transportation.
1.6.7.5 Transportation and land use considerations shall be integrated at all stages of the planning process.

PPS Section 1.6.8

1.6.8.1 Planning authorities shall plan for and protect corridors and rights-of-way for infrastructure, including transportation, transit and electricity generation facilities and transmission systems to meet current and projected needs.
1.6.8.2 Major goods movement facilities and corridors shall be protected for the long term.
1.6.8.3 Planning authorities shall not permit development in planned corridors that could preclude or negatively affect the use of the corridor for the purpose(s) for which it was identified.
New development proposed on adjacent lands to existing or planned corridors and transportation facilities should be compatible with, and supportive of, the long-term purposes of the corridor and should be designed to avoid, mitigate or minimize negative impacts on and from the corridor and transportation facilities.
1.6.8.4 The preservation and reuse of abandoned corridors for purposes that maintain the corridor's integrity and continuous linear characteristics should be encouraged, wherever feasible.
1.6.8.5 When planning for corridors and rights-of-way for significant transportation, electricity transmission, and infrastructure facilities, consideration will be given to the significant resources in Section 2: Wise Use and Management of Resources.

PPS Section 1.8

1.8.1 Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development patterns which:

a. promote compact form and a structure of nodes and corridors;
b. promote the use of active transportation and transit in and between residential, em ployment (including commercial and industrial) and institutional uses and other ar eas;
c. focus major employment, commercial and other travel-intensive land uses on sites which are well served by transit where this exists or is to be developed, or designing these to facilitate the establishment of transit in the future;

focus freight-intensive land uses to areas well served by major highways, airports, rail facilities

d. focus freight-intensive land uses to areas well served by major highways, airports, rail facilities and marine facilities;
e. improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;
f. promote design and orientation which:
g. maximizes energy efficiency and conservation, and considers the mitigating effects of vegetation; and
h. maximizes opportunities for the use of renewable energy systems and alternative energy systems; and
i. maximize vegetation within settlement areas, where feasible.

A Place to Grow: Growth Plan for the Greater Golden Horseshoe

Section 2.2.4

1. The priority transit corridors shown in Schedule 5 will be identified in official plans. Planning will be prioritized for major transit station areas on priority transit corridors, including zoning in a manner that implements the policies of this Plan.
2. For major transit station areas on priority transit corridors or subway lines, upper- and single-tier municipalities, in consultation with lower-tier municipalities, will delineate the boundaries of major transit station areas in a transit-supportive manner that maximizes the size of the area and the number of potential transit users that are within walking distance of the station.
3. Major transit station areas on priority transit corridors or subway lines will be planned for a minimum density target of:
   a) 200 residents and jobs combined per hectare for those that are served by subways;
   b) 160 residents and jobs combined per hectare for those that are served by light rail transit or bus rapid transit; or
   c) 150 residents and jobs combined per hectare for those that are served by the GO Transit rail network.
4. For a particular major transit station area, the Minister may approve a target that is lower than the applicable target established in policy 2.2.4.3, where it has been demonstrated that this target cannot be achieved because:
   a) development is prohibited by provincial policy or severely restricted on a significant portion of the lands within the delineated area; or
   b) there are a limited number of residents and jobs associated with the built form, but a major trip generator or feeder service will sustain high ridership at the station or stop.
5. Notwithstanding policies 5.2.3.2 b) and 5.2.5.3 c), upper- and single-tier municipalities may delineate the boundaries of major transit station areas and identify minimum density targets for major transit station areas in advance of the next municipal comprehensive review, provided it is done in accordance with subsections 16(15) or (16) of the Planning Act (2019), as the case may be.
6. Within major transit station areas on priority transit corridors or subway lines, land uses and built form that would adversely affect the achievement of the minimum density targets in this Plan will be prohibited.
7. The Province may identify additional priority transit corridors and planning requirements for major transit station areas on priority transit corridors or subway lines, to support the op

timization of transit investments across the GGH, which may specify: a) the timeframes for implementation of the planning requirements; b) the boundaries of the area that will be subject to the planning requirements; and c) any additional requirements that may apply in relation to these areas.

8. All major transit station areas will be planned and designed to be transit- supportive and to achieve multimodal access to stations and connections to nearby major trip generators by providing, where appropriate:
    a) connections to local and regional transit services to support transit service integration;
    b) infrastructure to support active transportation, including sidewalks, bicycle lanes, and secure bicycle parking; and
    c) commuter pick-up/drop-off areas.
9. Within all major transit station areas, development will be supported, where appropriate, by:
    a) planning for a diverse mix of uses, including second units and affordable housing, to support existing and planned transit service levels;
    b) fostering collaboration between public and private sectors, such as joint development projects;
    c) providing alternative development standards, such as reduced parking standards; and
    d) prohibiting land uses and built form that would adversely affect the achievement of transit-supportive densities.
10. Lands adjacent to or near existing and planned frequent transit should be planned to be transit-supportive and supportive of active transportation and a range and mix of uses and activities.
11. In planning lands adjacent to or near higher order transit corridors and facilities, municipalities will identify and protect lands that may be needed for future enhancement or expansion of transit infrastructure, in consultation with Metrolinx, as appropriate.

<u>Section 3.2.2</u>

1. Transportation system planning, land use planning, and transportation investment will be coordinated to implement this Plan.
2. The transportation system within the GGH will be planned and managed to:
    a) provide connectivity among transportation modes for moving people and for moving goods;
    b) offer a balance of transportation choices that reduces reliance upon the automobile and promotes transit and active transportation;
    c) be sustainable and reduce greenhouse gas emissions by encouraging the most financially and environmentally appropriate mode for trip- making and supporting the use of zero- and low-emission vehicles;
    d) offer multimodal access to jobs, housing, schools, cultural, and recreational opportunities, and goods and services;
    e) accommodate agricultural vehicles and equipment, as appropriate; and
    f) provide for the safety of system users.
3. In the design, refurbishment, or reconstruction of the existing and planned street network, a complete streets approach will be adopted that ensures the needs and safety of all road users are considered and appropriately accommodated.

4. Municipalities will develop and implement transportation demand management policies in official plans or other planning documents or programs to:

a) reduce trip distance and time;
b) increase the modal share of alternatives to the automobile, which may include se tting modal share targets;
c) prioritize active transportation, transit, and goods movement over single-occupant automobiles;
d) expand infrastructure to support active transportation; and
e) consider the needs of major trip generators.

Section 3.2.3

1. Public transit will be the first priority for transportation infrastructure planning and major transportation investments.
2. All decisions on transit planning and investment will be made according to the following criteria:

a) aligning with, and supporting, the priorities identified in Schedule 5;
b) prioritizing areas with existing or planned higher residential or employment densi ties to optimize return on investment and the efficiency and viability of existing and planned transit service levels;
c) increasing the capacity of existing transit systems to support strategic growth areas;
d) expanding transit service to areas that have achieved, or will be planned to achieve, transit-supportive densities and provide a mix of residential, office, institutional, and commercial development, wherever possible;
e) facilitating improved linkages between and within municipalities from nearby neigh bourhoods to urban growth centres, major transit station areas, and other strategic growth areas;
f) increasing the modal share of transit; and
g) contributing towards the provincial greenhouse gas emissions reduction targets.

3. Municipalities will work with transit operators, the Province, Metrolinx where applicable, and each other to support transit service integration within and across municipal boundaries.
4. Municipalities will ensure that active transportation networks are comprehensive and integrated into transportation planning to provide:

a) safe, comfortable travel for pedestrians, bicyclists, and other users of active transpor tation; and
b) continuous linkages between strategic growth areas, adjacent neighbourhoods, major trip generators, and transit stations, including dedicated lane space for bicyclists on the major street network, or other safe and convenient alternatives.

Metrolinx Act

The Greater Toronto Transportation Act was drafted in the spring of 2006, which involved the establishment of a corporation responsible for regional transportation planning throughout the Greater Golden Horseshoe (Government of Ontario, 2006). As a result, the province became the sole stakeholder responsible for regional transportation planning within the proposed boundaries. The official objectives of the provincial corporation were:

1. To provide leadership in the coordination, planning, financing and development of an integrated, multimodal transportation network which conforms with transportation

policies of growth plans prepared and approved under the Places to Grow Act, 2005 applicable in the regional transportation area and complies with other provincial trans portation policies and plans applicable in the regional transportation area;
2. To act as the central procurement agency for the procurement of local transit system vehicles, equipment, technologies and facilities and related supplies and services on behalf of Ontario municipalities.
3. To be responsible for the operation of the GO Transit system and the provision of other transit services.

The establishment of the Greater Toronto Transportation Authority officially allowed a single organization to plan for and organize an integrated regional transportation plan and system, an aspect that had otherwise fallen outside the scope of municipal public transport providers operating within the area. Notably, GO Transit, a provincial corporation responsible for providing regional train and bus service in and around the GTHA, did exist since the 1960s. However, expansion and the provision of adequate service along key corridors never materialized due to confusing funding structures and resulting funding reductions in the 1990s. Additionally, the task of coordinating service and corridor planning across municipal boundaries was complicated by the fact that a common framework and decision-making structure was hard to agree on due to various localized inputs. This was highlighted between the years of 1998 and 2001, where the corporation had been downloaded from the province to municipalities within the GTHA (Keil, Young, 2008 pg. 745 & Fleischer, 2014). Therefore, the introduction of the Greater Toronto Transportation Authority was seen as a step in the right direction for regional transportation planning in the area, as a consistent regional transportation plan could be drafted and acted on with provincial authority. In the years following the introduction of the Greater Toronto Transportation Authority, large advancements in regional transportation planning across the region were realized. This was shown as the region's first ever regional transportation plan, titled "The Big Move", was released in 2009, and was followed by an update, titled the 2041 Regional Transportation Plan, in 2018. This policy established a coordinated direction and vision about how regional transport in the area should evolve (Metrolinx, 2008). it also presented a regional transportation direction for the area until 2031, and identified "quick wins" that could be established by the corporation to enhance transit connections and service in the area, which could both be timely and cost efficient. Additionally, several complementary pieces of legislature, such as the Greater Toronto and Hamilton Area Transit Implementation Act of 2009, combined the Greater Toronto Transportation Authority and GO Transit into one corporation titled "Metrolinx" (Government of Ontario, 2009). This further streamlined the provision of regional public transportation, as planning and service implementation now laid under one corporation and governing legislation.

Appendix B - GTHA Context: Municipalities List

Authority	Type	Population (2016)
Ajax	Town	119,677
Aurora	Town	55,445
Brampton	City	593,638
Brock	Township	11,642
Burlington	City	183,314
Caledon	Town	66,502
Clarington	Municipality	92,013
Durham	Regional Municipality	645,862
East Gwillimbury	Town	23,991
Georgina	Town	45,418
Halton	Regional Municipality	548,435
Halton Hills	Town	61,161
Hamilton	City	536,917
King	Township	24,512
Markham	City	328,966
Milton	Town	110,128
Mississauga	City	721,599
Newmarket	Town	84,224
Oakville	Town	193,832
Oshawa	City	159,458
Peel	Regional Municipality	1,381,739
Pickering	City	91,771
Richmond Hill	Town	195,022
Scugog	Township	21,617
Toronto	City	2,731,571
Uxbridge	Township	21,176
Vaughan	City	306,233
Whitby	Town	128,377
Whitchurch-Stouffville	Town/Municipality	45,837
York	Regional Municipality	1,109,909

Appendix C - BRT and Priority Bus North American Database

No.	City	Country	Type (as refer	Length	System Name	Right-of-Way Classification	Signal Priority (y/n)	Stop spacing greater than local routes?	Additional Notes	Final Classification	References
1	Mississauga	CAN	BRT	18 KM	MiWay / MiExpress	ROW A / B	Yes	Yes	Some routes use the Mississauga TransitWay, the first dedicated transitway in the GTHA - however, large portions of the network operate on Bus ByPass Shoulders and HOV lanes.	BRT (if using transitway), Priority Bus if not.	http://www.mississauga.ca/portal/miway/transitway http://www.mississauga.ca/portal/miway/brtbasics?paf_gear_id=9700018&itemId=102600571n
2	Ottawa	CAN	BRT	59 KM	OC Transpo	ROW A/B/C - dedicated right of way exists on the Transitway, but some operations occur in mixed traffic	Yes	Yes	System is currently undergoing massive changes as main BRT line now transitioning to the LRT Confederation Line.	Hard to determine due to introduction of LRT, not sure which mode is more dominant	https://documents.ottawa.ca/sites/documents/files/documents/tmp_en.pdf https://www.queensu.ca/geographyandplanning/sites/webpublish.queensu.ca.dgpwww/files/files/SURP/Theses%20and%20Reports/Laura_Moebs_Exec_Summary.pdf
3	Quebec City	CAN	BRT	60 KM	Metrobus	ROW B / C	Yes	Yes	Information ahrd to access due to language restrictions	Priority Bus	https://rtcquebec.ca/Default.aspx?tabid=104&language=en-CA http://transitquebec.com/transitquebecv3/?page_id=38
4	Winnipeg	CAN	BRT	4 KM	RT, Southwest Transitway	ROW A, completly seperated transitway	Yes	Yes	SW Transitway to become operational in 2020, additional feeder routes planned in the future	BRT	https://winnipegtransit.com/en/major-projects/rapid-transit/southwest-transitway/#tab-faqs
5	York Regional Municipality	CAN	BRT	38 KM	Viva	ROW A / B - mix of dedicated ROW and mixed traffic	Yes	Yes	Majority of routes to be completed by 2020	BRT	http://www.metrolinx.com/en/greaterregion/projects/york-viva-bus-rapid-transit.aspx https://www.york.ca/wps/wcm/connect/yorkpublic/d7ec2651-8dc5-492e-b2a0-f76605edc122/2016+TMP+Big+Book.pdf?MOD=AJPERES
6	Brampton, Ontario	CAN	BRT	n/a	Zum	ROW C, busses operate in mixed traffic	Yes	Yes	Goal is to transition to true ROW C operations by 2031	Priority Bus	https://www.brampton.ca/EN/residents/transit/zum/Pages/About.aspx https://www.brampton.ca/EN/Business/planning-development/transportation/Documents/TR4_FutureTransitProvisions.pdf
7	Calgary, Alberta	CAN	BRT	n/a	MAX BRT	ROW B and C, operating in mxied traffic environments with some use of dedicated bus lanes, no mention of physical seperation	Yes	Yes	4 routes launched, all connect major destinations and convene in CBD	Priority Bus	https://www.calgary.ca/Transportation/TI/Pages/Transit-projects/Transitway-and-BRT-Projects.aspx https://www.calgarytransit.com/max#tab=line-purple
8	Durham Region, Ontario	CAN	BRT	n/a	DRT Pulse	ROW B and C, operating in mixed traffic environments and HOV lanes	Yes	Yes	Extreme lack of resources at the municipal level, majority of resources will come from the province ex. MEtrolinx	Priority Bus	https://www.durham.ca/en/doing-business/resources/Documents/PlanningandDevelopment/2019-P-41-Envision-Durham-Transportation-System-Discussion-Paper-CR-and-Attachment-1.pdf https://durhamtmp.files.wordpress.com/2018/07/durhamtmp_finalreport_2018-07-09-web-accessible.pdf
9	Halifax, Nove Scotia	CAN	BRT	n/a	MetroLink / Urban Express	ROW C, some ROW B with bus lanes and queue jump lanes	Yes	Yes	MetroLink currently in operation, Urban Express routes in development	Priority Bus	https://www.halifax.ca/sites/default/files/documents/transportation/halifax-transit/Halifax%20Transit%20-%202019-2020%20Annual%20Service%20Plan.pdf https://www.halifax.ca/sites/default/files/documents/transportation/halifax-transit/MFTP%20-%20PlanOnly.pdf
10	Kelowna, British Columbia	CAN	Rapid Bus	30km	RapidBus, 97 Okanagan	ROW C, sometimes uses HOV lanes.	Yes	Yes, limited stops.	n/a	Priority Bus	https://globalnews.ca/news/71380/rapid-transit-buses-coming-to-kelowna/ https://bctransit.com/kelowna/schedules-and-maps/route-overview?route=97 http://www.kelownadailycourier.ca/business_news/article_e7d0a008-361e-11e4-9cce-0017a43b2370.html
11	Montreal, Ontario	CAN	BRT	10 km	PIE-IX BRT	ROW A	Yes	Yes	In development	BRT	http://www.stm.info/en/about/major_projects/pie-ix-brt https://www.wsp.com/en-CA/projects/pie-ix-bus-rapid-transit
12	Niagaria Falls, Ontario	CAN	n/a	n/a	WEGO	n/a	n/a	n/a	Exclude from analysis as this operates as a shuttle to and from tourist attractions in the area, and is not a part of city's overall public transport network.	n/a	https://www.wegoniagarafalls.com/about-wego/
13	Saskatoon, Saskatchewan	CAN	BRT	n/a	DART	ROW C, some ROW A/B	Yes	Yes	Only 10% of route will operate in ROW A dedicated transit only lanes, majority of operation will be in mixed traffic environment. Route is currently in development and is not oeprational.	Priority Bus	https://www.saskatoon.ca/sites/default/files/documents/community-services/planning-development/integrated-growth-plan/growing-fwd/brt_overall_summary.pdf https://www.saskatoon.ca/engage/transit-plan
14	Toronto, Ontario	CAN	Express Bus	n/a	Express Bus Network	ROW C	Yes	Yes	25 express routes in total	Priority Bus	http://ttc.ca/express/index.jsp https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2017/June_15/Reports/6_Express_Bus_Network_Study_combined.pdf
15	Vancouver, British Columbia	CAN	Express Bus w/ BRT elements	n/a	B-Line / RapidBus	ROW C, some ROW B via dedicated bus lanes, but no physical seperation	Yes	Yes	2 B-Lines currently in operation, RapidBus to upgrade this line and add 4 more additional lines.	Priority Bus	https://www.translink.ca/Plans-and-Projects/RapidBus-Program.aspx
16	Waterloo Region, Ontario	CAN	Express Bus	n/a	iXpress	ROW C, some ROW B via queue jump lanes	Y, but only on some routes	Y	n/a	Priority Bus	https://www.grt.ca/en/about-grt/resources/GRT-Business-Plan-2017-2021.pdf https://www.grt.ca/en/about-grt/express-buses.aspx

No.	City	Country	Type (as referred to by operating agency)	Length	System Name
1	Hartford region	US	BRT	15 KM	CTfastrak
2	Richmond, Virginia	US	BRT	12 KM	GRTC Pulse
3	Albuquerque	US	BRT	14 KM	ART
4	Alexandria-Arlington	US	BRT	11 KM	Metroway
5	Cleveland	US	BRT	11 KM	HealthLine
6	Eugene	US	BRT	19 KM	The Emerald Express (EmX)
7	Fort Collins	US	BRT	8 KM	MAX
8	Las Vegas	US	BRT	63 KM	Metropolitan Area Express
9	Miami	US	BRT	34 KM	Miami-Dade Transit
10	New York	US	BRT	90 KM	Metropolitan Transportation Authority
11	Orlando	US	BRT	5 KM	LYNX
12	Pittsburg	US	BRT	30 KM	Bay Area Rapid Transit (BART)
13	San Bernardino	US	BRT	26 KM	sbX
14	Seattle	US	BRT/ Priority Bus Corridor	N/A	RapidRide

Appendix D - Best Practices Review Full Policy List

Intensification

CALGARY

Calgary Transportation Plan

Chapter 3.3 Transit

Helping to shape and create more intense, mixed-use development within walking distance of public transit stops and stations which, in turn, will generate increased transit use;

Link land use decisions to transit

Compact, mixed-use development and pedestrian-friendly designs are required along the existing and future Primary Transit Network. This will be supported by timely investment in new transit lines and improved transit service levels to support land use intensification.

Regional Transit

Transit Mobility Hubs are a place of connectivity where different modes of transportation (i.e., walking, cycling, bus and rail transit) come together seamlessly, and where there is an attractive, intensive and diverse concentration of housing, employment, shopping and other amenities around a major transit station

G. Timely investment in new transit lines and improved transit service levels, focusing on the Primary Transit Network, should be provided to support existing higher intensity areas and encourage intensification of new, priority-growth areas.

Calgary Transit Oriented Development Policy Guidelines

4.0 Ensure transit supportive land uses

Ensure land uses around Transit Stations support ridership by generating high levels of transit use and provide a mixed-use activity node for the local community and city-wide transportation network benefits. This provides the local community with increased services, employment, and housing options within their community.

4.1 Transit-supportive land uses

Transit-supportive land uses encourage transit use and increased transportation network efficiency. As such, the pattern of land uses around LRT stations should be characterized by:

- high employee and/or residential densities
- promoting travel time outside of the am/pm peak periods
- attracting reverse-flow travel on roads and LRT
- encouraging extended hours of activity, throughout the day and week
- attracting pedestrian users / generates pedestrian traffic

4.3 Limit non transit-supportive land uses

As the focus of TOD is the transit rider and pedestrian, it is important that auto-oriented development does not overwhelm the station area. Non-transit supportive land uses are oriented primarily to the automobile and not the pedestrian or transit user

5.0 Increase density

Increase density around all Transit Stations to support high frequency, rapid transit service and provide a base for a variety of housing, employment, local services and amenities that support a vibrant station area community.

5.1 Optimize density around each station

Density should be increased around Transit Stations while relating to the surrounding context and particular station type. Density should be placed in locations with the best access to transit and the local public systems.

· Locate the highest density uses and building forms (e.g. apartments, office towers) as close as possible to the LRT station building.

· In new communities, densities should be established for a station planning area and not included as part of the gross community density targets of 6 to 8 units per acre.

Calgary Municipal Development Plan

2.2.1 Vibrant, transit-supportive, mixed use Activity Centres and Main Streets

Objective Build and diversify urban activities in Activity Centres and Main Streets.

Areas identified for future Activity Centres generally have a low-density built form today and an existing employment character to build upon. Their parcel size, location and built form provide the potential for comprehensive, higher-intensity development that can be integrated with the Primary Transit Network as well as with adjacent communities

Development opportunities within Main Streets relate to their existing role as retail streets and their potential to become places for urban intensification along the Primary Transit Network. The existing block layouts, business types and varied ownership patterns means planning and development may transform incrementally. Main Streets are classified into two types:

- Urban Main Street Bylaw 19P2017
- Neighbourhood Main Street Bylaw 19P2017

Policies

a. Direct a greater share of new growth to the Activity Centres and Main Streets identified on Map 1, in a manner that:

i. Provides compact, mixed-use, high-quality urban development;

iii. Achieves the residential and employment intensity thresholds of the applicable Activity Centre and Main Street contained in Part 3 of the MDP;

b. Plan the development of Activity Centres and Main Streets appropriate to the local context by:

iii. Locating the tallest buildings and highest densities closest to transit stops and stations and in strategic sites, identified by a local area planning process, and stepping down heights and densities away from these sites; Bylaw 19P2017

d. Support Activity Centres and Main Streets as locations for the growth and intensification of major employment uses (including post-secondary and medical institutions) by linking them to the Primary Transit Network.

2.2.2 A transit supportive land use framework

Objective Establish a land use framework that optimizes population and job growth within walking distance of transit.

To be cost-effective, transit must reach a sufficiently sized pool of potential riders. Development of population and jobs above minimum density levels is essential, as this affects the quality (frequency of service), range (service choices) and duration (hours of operation) of transit service that can be provided in an area. Minimum thresholds of 100 people or jobs per gross developable hectare are needed within walking distance of a transit network (approximately 400 metres) to support service levels of 10 minutes or less over extended periods of the day.

Where higher orders of employment or residential intensification are desired in MACs or Urban Main Streets to support numerous routes of the Primary Transit Network, minimum thresholds of 200 people or jobs per gross developable hectare should be achieved within walking distance of the transit stop or station.

Bylaw 19P2017
Calgary Transit Oriented Development Policy Guidelines

The Transit Oriented Development Policy Guidelines provide direction for the development of areas typically within 600m of a Transit Station - an existing LRT station or BRT station where an LRT station will eventually develop. This type of development creates a higher density, walkable, mixed- use environment within station areas in order to optimize use of existing transit infrastructure, create mobility options for Calgarians, and benefit local communities and city-wide transit riders alike. The City of Calgary's Transit Oriented Development Policy Guidelines (TODPG) guide how development should occur within 600m of an existing light rail transit (LRT) station or a bus rapid transit (BRT) station that will be converted into an LRT station in the future. Ensure land uses around Transit Stations support ridership by generating high levels of transit use and provide a mixed-use activity node for the local community and city-wide transportation network benefits. This provides the local community with increased services, employment, and housing options within their community. Increase density around transit stations. Increase density around all Transit Stations to support high frequency, rapid transit service and provide a base for a variety of housing, employment, local services and amenities that support a vibrant station area community

HALIFAX

Halifax Integrated Mobility Plan

3.2.5 Policies & Actions

a) Plan new and existing Transit Priority Corridors and terminals as focal points for higher density, compact development with a mix of residential, commercial and employment uses within walking distance of transit service.

Action 89: Plan transit terminals based on transit-oriented development principles, such as strong pedestrian connections and human scale design (see Section 2.2 Land use & Transportation for more direction)

2.1.3 Policies & Actions

F) "Revise the Halifax region's sub-regional 2031 mode share targets and geographic data collection areas to better align with the settlement patterns in the Centre Plan"

Action 10: Formally establish boundaries for reporting sub-regional mode share in the Halifax region based on the boundaries included in the 2014 Regional Plan. The perimeter of the Outer Urban area should align with the Urban Service Boundary. Statistics Canada data should be requested based on the consistent boundaries, regardless of changes to census tract locations.

Action 11: Revise mode share targets for each sub- region to better align with more realistic values, while retaining the current 2031 region-wide targets.

"Other" Section

Integration of Transit Oriented Development (TOD): Population density is arguably the most critical factor in determining the economic viability of commuter rail service in the region. Population along the corridor is projected to increase; however, the scale of density expected to be required at each terminal would require significantly more intensive development around the terminals than is currently typical in the region. Based on a preliminary review of the proposed terminal locations, it does appear that there is potential to develop high density population nodes in their vicinity. A better understanding of the transit-oriented development potential is required to inform a decision on the service that can be provided. The following issues will need to be considered:

Action 97: Increase the priority of transit in the transportation network by implementing a BRT system in Halifax with dedicated bus lanes, based on the findings of the Bus Rapid Transit Feasibility Study currently underway.

SEATTLE

Seattle Multimodal Transportation Policy Framework: Important plans and documents that support and complement the TMP include:

Seattle Transit Master Plan (2012)

STRATEGY: INVEST IN PROGRAMS THAT BUILD TRANSIT RIDERSHIP

Many of the most cost effective ways to build transit rider- ship and create mode shift are not direct service or capital investments, but development of supportive programs. The TMP recommends that programmatic funds be identified and allocated to a suite of programs that improve access to transit service, improve customer knowledge, overcome major safety obstacles to transit access and use, improve transit supportive policies, and leverage Seattle's investments through partner- ships with transit providers.

Strategy PP4: Invest in Transportation Demand Management Programs that Increase Transit Use

Expand TMAs to other urban centers such as the U-District, Northgate, and other areas with a high concentration of employment and demonstrated interest from the private sector. The City of Seattle, King County, and Seattle businesses and institutions already support a strong suite of transportation demand management (TDM) programs. For example:

- The Downtown Transportation Alliance (a partnership between the Downtown Association, Metro, and the City of Seattle) supports Commute Seattle, an initiative that provides one-stop shopping for transportation resources in downtown Seattle
- The Duwamish Transportation Management Association (TMA) improves transportation options for employees in the Duwamish Business Community
- The City's Transportation Management Program requires developers to prepare a Transportation Management Plan (TMP) to reduce the potential traffic and parking impacts

Work with Commute Seattle and transit agency partners to improve transit pass programs for employees of smaller firms that are not required to provide employee transportation benefits. This could include an expanded universal transit pass program that would leverage the highly discounted rates afforded to larger organizations to provide free or discounted transit benefits to employees of these smaller employers. A relatively small amount of City funding would be required. This program could be implemented through Commute Seattle or by building specific TMAs.

The Seattle Comprehensive Plan identifies an Urban Village Strategy to promote job and housing growth in concentrated centers that can be efficiently ac- cessed and connected by a multimodal transportation system, including high quality, frequent transit. The Comprehensive Plan sets mode shift goals that promote a transition to non-single occupant vehicles. A major update to the Seattle Comprehensive Plan is underway. Elements of the Plan will be updated incrementally through 2015. TMP recommendations will be considered as one element in a framework for sustainable growth.

The Transportation Strategic Plan (TSP) provides more detailed policy and investment direction for preservation, maintenance, and development of Seattle's multimodal transportation system. The TSP is currently being updated with a shifting focus from an auto- oriented approach to one that makes walking, biking, and taking transit easier, safer, and more enjoyable.

Chapter 3 of the Transit Master Plan Briefing Book describes Seattle's transit, transportation,

and land use policy framework in greater detail.

Connectivity in Calgary

Intermodal Connectivity	Active Transportation	Integrated with Development	Provisions for Safe and Unobstructed routes
✓	✓	✓	✓

Land-use Policies

Intermodal Connectivity

MDP – 7.3 Transit Network

e.Allow for the convenient and direct transfer of passengers between buses and Light Rail Transit and/or Bus Rapid Transit stations to other forms of public transportation.

MDP – Mobility Policies

j. Create an internal street network that is interconnected, multi-modal and recognizes the needs of all users, in accordance with the Local Transportation Connectivity policies of the CTP.

RA – 2. Network Planning

a.Match transit with land use: support activity centres and corridors, enhance Primary Transit Network connectivity, and support intensification of population and employment.

Active Transportation

MDP – 6.4 Road and Street Network

a.The street network should accommodate walking, cycling and the efficient provision of public transit in a manner that is accessible to all Calgarians.

b.Any new streets or lanes should be designed to improve connectivity and promote walking, cycling and a sense of place.

MDP – 7.4 Road and Street Network

f. Establish pedestrian and bicycle connections in all Local Area Plans, including details about how those routes connect to station areas and surrounding communities.

CTP – 3.2 Walking and Cycling

c. The amount, directness, connectivity, accessibility, comfort, character and safety of pedestrian and bicycle routes should be increased.

e.Walking and cycling must be integrated with transit services and improve intermodal opportunities at the community, city and regional scales.

RA – 1. Customer Experience

1.Identify bus stops with a combination of high ridership and barriers to access (e.g. no sidewalks) to plan and implement future pedestrian and cycling improvements.

2.Increase the number of bus routes with bike racks on buses. Focus future bike racks on buses and bikes on trains on long-haul trips (not community shuttle runs where trips are close in length to cycling distances).

Cycling Strategy – 6.1.2 Plan and build bicycle infrastructure

C16. Plan improvements to bicycle routes in conjunction with new transit hubs (e.g.

Southeast Transitways and BRT Network).

C20. Explore the feasibility to include pathways next to existing LRT or BRT right-of-way and protect for pathways next to future LRT or BRT right-of-way by including them in functional and land use plans.

Integrated with development

MDP - 6.3. Transit Network:

c. Developments located adjacent to Light Rail Transit and/or Bus Rapid Transit stations should seamlessly integrate with these facilities (e.g., orient entrances to the station, provide shelter, include additional setbacks).

Provisions of safe and unobstructed routes

MDP – 7.3 Transit Network:

d.Provide safe, direct and unobstructed routes for all users, including those with mobility challenges, to connect from transit zones to the pedestrian and bikeway network.

CTP – 3.8 Local Transportation Connectivity

c. Street and walkway configurations should be designed to maximize accessibility to major destinations and transit facilities within Future Greenfield communities and Activity Centres, while also minimizing the impact of traffic on other users, adjacent businesses and residents

RA – 2. Network Planning

c. Design the network for a connective grid: evolve from a radial network focused on the downtown to a connective grid that facilitates travel between activity centres.

Connectivity in Halifax

Intermodal Connectivity	Active Transportation	Integrated with Development	Provisions for Safe and Unobstructed routes
✓	✓	✓	✓

Land-use Policies
Intermodal Connectivity

2.3.5 Policies & Actions

a)Integrate the Complete Streets approach into street planning and design processes, including neighbourhood planning and streetscape improvement projects.

3.4.5 Policies & Actions

c)Make strategic upgrades to the road network, particularly when they support multi-modal improvements.

Active Transportation
IMP – 2.1.3 Integrated Planning - Policies & Actions

d) Make it easier and safer to walk through the Halifax Region.
Action 7: Identify and implement new sidewalks, multi-use pathways and enhanced crossing treatments to connect networks and better manage interactions between pedestrians and motor vehicles.

IMP – 3.1.5 Policies & Actions

e) Connect communities by facilitating improved links for active transportation across geographical or structural barriers.

Making Connections: 2014 – 2019 Active Transportation Priorities Plan

Recommendation #25: Bicycle facility development in urban areas outside the regional centre should focus on:

1. Improved connections to local destinations, such as schools, recreation centres, libraries, retail centres and transit hubs.

Integrated with development

IMP – 2.2.5 Policies & Actions

c) Encourage all future development to take the form of Complete Communities with opportunities to work, study, shop, play and obtain personal services within an attractive walking distance of where people live.

d) Work with the province, hospitals, school boards and other institutions to ensure that new public facilities are located within existing or planned transit-oriented development and within a 5-min. walk (500 m) to frequent, accessible transit service.

Provisions of safe and unobstructed routes

IMP – 2.3.5 Policies & Actions

b) Wherever appropriate, prioritize walking, bicycling and transit when allocating road right-of-way space and integrate the needs of people with disabilities into street design.
Action 39: Work toward improving accessibility and connectivity of sidewalks, crosswalks and transit stops.

IMP – 2.1.3 Policies & Actions

a) Design streets to accommodate people of all ages and abilities, including those with physical, visual, auditory and cognitive disabilities.

c) Reduce the likelihood of serious injuries and fatalities on streets and other transportation facilities, taking a "Towards Zero" (zero injuries and fatalities) approach.

Connectivity in Halifax

Intermodal Connectivity	Active Transportation	Integrated with Development	Provisions for Safe and Unobstructed routes
✓	✓	✓	✓

Land-use Policies

Intermodal Connectivity

2.3.5 Policies & Actions

a) Integrate the Complete Streets approach into street planning and design processes, including neighbourhood planning and streetscape improvement projects.

3.4.5 Policies & Actions

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Active Transportation

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IMP – 2.2.5 Policies & Actions

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Provisions of safe and unobstructed routes

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Action 39: Work toward improving accessibility and connectivity of sidewalks, crosswalks and transit stops.

IMP – 2.1.3 Policies & Actions

a) Design streets to accommodate people of all ages and abilities, including those with physical, visual, auditory and cognitive disabilities.
c) Reduce the likelihood of serious injuries and fatalities on streets and other transportation facilities, taking a "Towards Zero" (zero injuries and fatalities) approach.

Design

Halifax- MetroLink

Integrated Mobility Plan

Transit/design policies and time frame

Provide amenities for pedestrians at bus stops like shelters, landing pads, litter bins, etc.; Enhanced access to sidewalk so it promotes transit (sidewalk development)
Pedestrian friendly street design

Policy 2.3.5:

- Adopt policies to reflect in the neighborhood design and streetscape
- Prioritize walking, bicycling when allocating ROW
- Design streets that create a sense of place
- Incorporate Halifax Green Network Plan to support urban forestry and ecology

"**Complete streets:** An approach to planning, design, operations and maintenance of roadways to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation."

- Street as "Links and Places"
- Land use design to support the design of complete communities
- Attractive and convenient streetscape

Policy 2.1.3:

- Design streets to accommodate people of all ages and abilities, including those with physical, visual, auditory and cognitive disabilities
- Revise street classification and standards to support all travel modes, street function and land uses
- Revise design guidelines to incorporate best practices for all design elements
- Transit oriented development to support pedestrian design
- Specific targets for sustainability of the transportation system closely associated with

settlement patterns and community design
- Improve streetscape design to encourage people to walk

Policy 2.2.5:
- Encourage all future development to take the form of Complete Communities with opportunities to work, study, shop, play and obtain personal services within an attractive walking distance of where people live.
- Pedestrian- oriented site design and human scaled massing at street level.
- Growth targets to accommodate 40% new housing units within Regional Centre; outlines in the centre plan.
- The Regional Plan, targets an increase of transit use from 12% to at least 16% and active transportation use from 11% to at least 14%

BRT Study- Transportation Standing Committee, Dillon Consultants report
- Transit priority measures
- Allow bypass of buses
- Should be deployed with existing ROW
- BRT stations should be designed for modal integration and have easy connections amongst pedestrians, cyclists, transit users, and park and ride users.
- Transit exclusivity can be provided by designated bus-only lanes on roadways.
- Signal priorities

Calgary

Calgary Transportation Master Plan

CTP land use and mobility goals:
- Transit
- Complete streets
- Provide more sustainable modes of transport
- Enable public transit, walking and cycling as the most preferred mobility choices for a majority
- Pedestrians and cyclists should be given the highest priority. Along transit corridors, priority must be given to transit
- Pedestrian walking distance to transit stops must be minimized to 400m or less. In any case, up to 5% of the population may live beyond the 400m walking distance
- Optimize infrastructure
- Safe, clean and comfortable to ensure ease of transfer between transit services and other modes
- Transportation infrastructure must be accessible to all irrespective of age and abilities
- Create complete streets
- Multi-modal streets with green infrastructure strategies and public realm elements

Policy 3

- Provide more mobility choices
- Optimize infrastructure
- Create complete streets

- Ensure accessible transportation infrastructure

Comprehensive policies list:

"Safe, barrier-free walkways and pathways should be provided in community designs to reduce pedestrian and bicycle distance to transit service and community amenities."

"A full range of strategies such as traffic signal optimization, pedestrian scramble crossings and pedestrian countdown timers should be used to improve convenience for pedestrians and cyclists at locations where high volumes of pedestrians and cyclists already exist or are expected in the future."

- Link land use decisions to transit
- Incorporate new transit technologies and innovations
- Sustain fleet and infrastructure
- Ensure the right balance between mobility, green infrastructure and public realm to meet goals of CTP

Policies for complete streets

One of their goals is to enable public transit, walking and cycling as the preferred mobility choices for most people.

Transit friendly design guide, 1995, updated 2006

- Provide appropriate community densities
- Minimize walking distance
- All dwellings should be within a 400m walking radii from transit stops.
- Provide mixed land uses
- Organize density, land use and buildings to benefit from transit
- Pedestrian friendly environment
- Reroute transit into the community
- Reduce transit travel time
- Build quality, user friendly transit facilities
- Minimum density requirement of 17.3 units per gross hectare
- Increase transit service to appx. 2.5 transit service hours per capita over the next 30 years, with emphasis on market segments, corridors and development modes
- Increase transit users by providing bus only lanes, and signal priority

Seattle

Transit-oriented neighbourhood design

1. Destination Accessibility: Coordinate land uses and transit network

ToN1.2: Direct most development within urban villages, urban centers, and along the FTN.

ToN1.3: Design transit nodes, stations, and corridors to maximize their value to neighborhoods.

2. Distance: Create transit-supportive urban structure and street network

ToN2.1: Provide a fine-grained pedestrian and bicycle network that connects to tran-

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3.Density: Concentrate and intensify activities near transit

ToN3.1: Use zoning to focus the highest densities closest to transit corridors and nodes

4. Diversity: Encourage mixed uses

ToN4.1: Mix residential, employment, recreation, and commercial uses in station areas and along FTN
Fine-grained mix of uses with highly active ground floor uses
Healthy balance of housing types

5: Design: Placemaking

ToN5.1: Design: Provide gathering spaces that encourage pedestrians to linger

- Plazas, squares and parks in human scale
- Public art
- Range of seating types
- Facility (Infrastructure) design guidelines
- Legibility
- Wayfinding and Passenger Information
- Spatial capacity
- Universal accessibility
- Safety and Security
- Passenger comfort

Mobility Corridor design

1. Modal Integration

MC1.1: Development of Mobility Corridors should integrate principles of context sensitive Complete Street design that are unique to conditions found in each corridor.

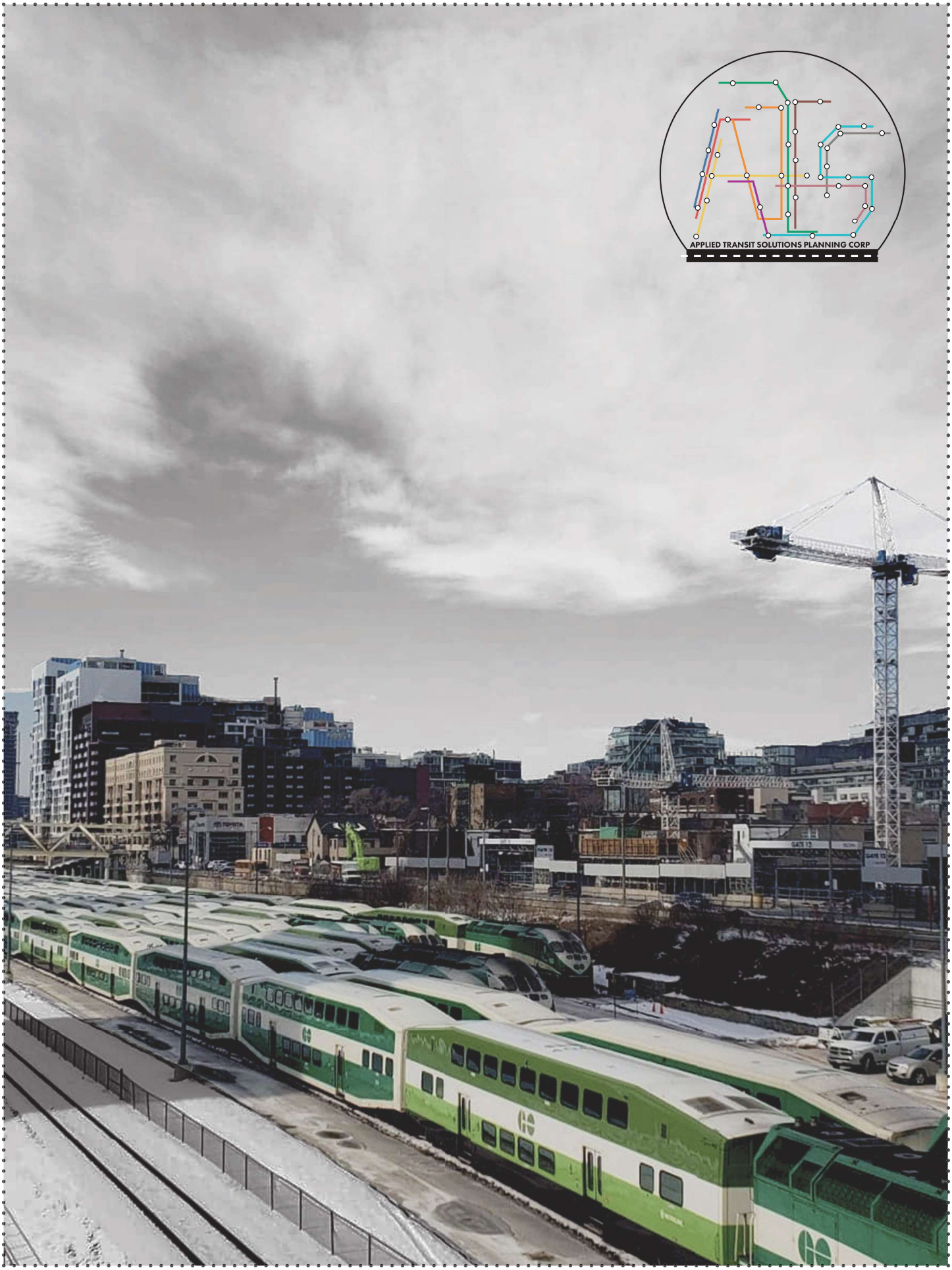
2. Transit

MC2.3: Design linear transit facilities that minimize conflicts and pinch points with other roadway users and facilitate in-lane stops.

3. Pedestrian

MC3.1: Pedestrians should be afforded the highest priority in corridor space allocation to maintain an attractive public realm that connects to transit facilities.

(Mobility Corridor design should reflect the fact that even if a transit facility is located within a reasonable walking distance of a person's origin and destination, the walking environment will influence their choice to use transit)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