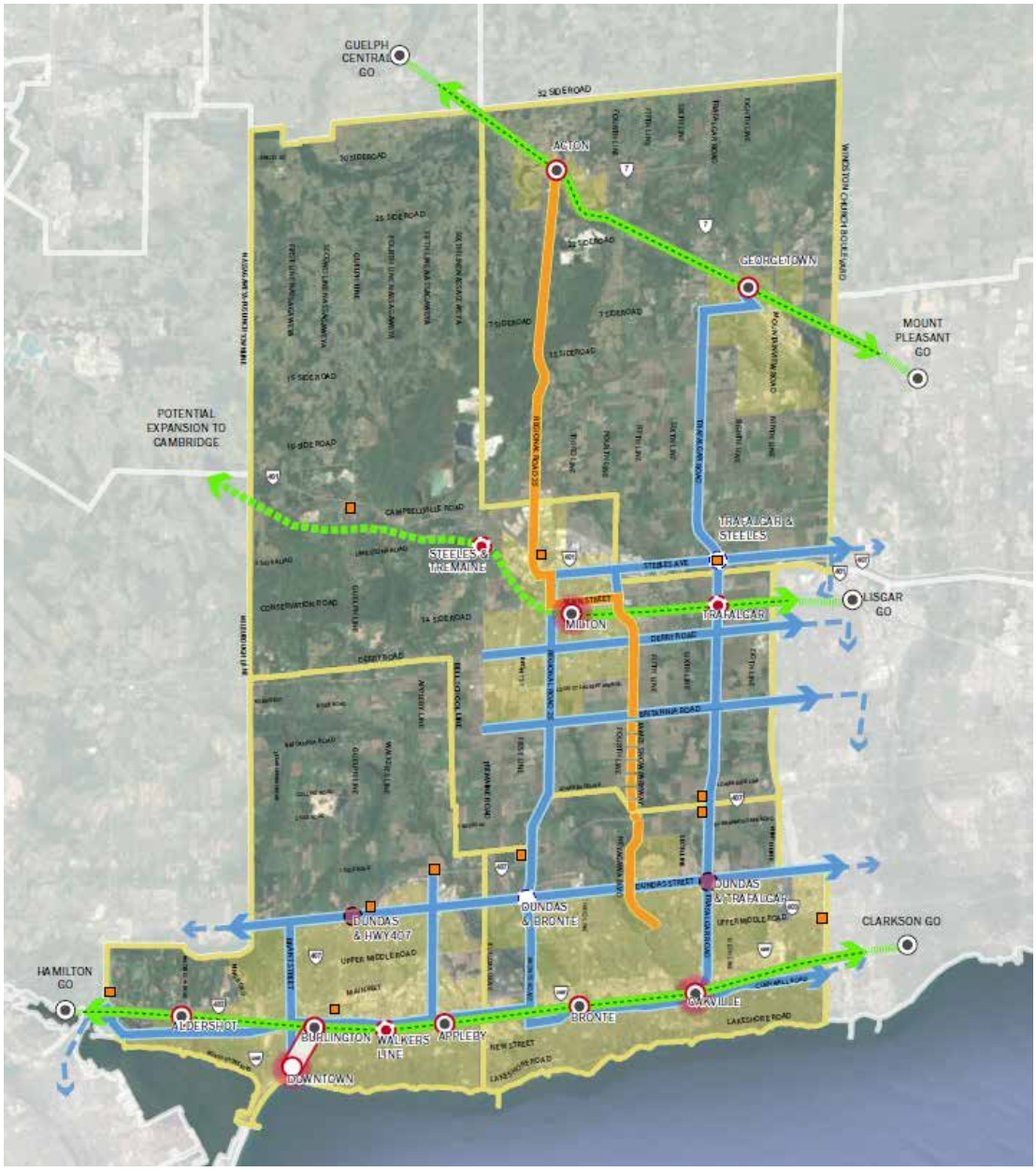
DEFINING MAJOR TRANSIT REQUIREMENTS IN HALTON REGION



EXECUTIVE SUMMARY

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HDR COLE ENGINEERING URBAN STRATEGIES INC

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1 | INTRODUCTION

Halton is a prosperous and rapidly growing region in the core of the Greater Toronto-Hamilton Area (GTHA). Located along Lake Ontario at the western edge of the Greater Toronto Area, the Region is geographically and economically diverse. Halton Region is comprised of four Local municipalities that vary in size, population, and character: the City of Burlington, the Town of Halton Hills, the Town of Milton, and the Town of Oakville. The Region includes urban settlement areas, a rural countryside, public open spaces, and a Natural Heritage System (NHS) that includes a portion of the Greenbelt Plan Protected Countryside designation and Niagara Escarpment Plan. The Region is also home to a wide diversity of economic activity, from the headquarters of international corporations to family farms, heavy industry, office parks, research and development centres, small businesses, and retail centres that draw customers from throughout Southern Ontario.

As in many of the municipalities in the GTHA, recent growth in Halton has resulted in greater demands on the transportation network. By the year 2041, the population and employment in Halton Region is expected to more than double to 1,000,000 people and 470,000 jobs. While this growth comes with exciting opportunities for new investments and prosperity, it will also increase the need to balance growth throughout the Region and address additional demands on the transportation system in order to support vibrant and prosperous communities.

The Region's Transportation Master Plan (TMP) (2031) – The Road to Change was completed in 2011 to support the balanced approach to growth laid out in Regional Official Plan Amendment 38 (ROPA 38). The TMP identified the need to transition to a more balanced transportation network to accommodate increased travel demands on the network in order to support all modes of transportation. The vision for the TMP was to accommodate various travel choices and support a sustainable and multi-modal transportation network in the future.

The preferred transportation strategy for Halton Region to 2031 included recommendations and initiatives to support the shift toward a multi-modal approach to transportation that included providing additional capacity in the Regional roadway network (i.e. road widening), active transportation, transportation demand management, and transit. In 2015, the Region completed its first Active Transportation Master Plan to develop the required strategy, infrastructure and initiatives to promote non-motorized travel throughout the Region.

Building on the vision and recommendations of the TMP, and in preparation for Metrolinx's Regional Express Rail (RER), Halton Region and its Local municipal partners developed the Mobility Management Strategy (MMS) for Halton. The strategy, as outlined in Report No. PW-03-17/LPS13-17, re: "Mobility Management Strategy for Halton", was developed to guide the evolution of a region-wide inter/intra regional transportation network over the next 25 years to 2041. The strategy focused on the principle of "Mobility-as-a-Service", recognizing that mobility options are no longer clearly divided between automobile and transit, but rather focus on a menu of travel options including sustainable and active transportation modes. In establishing the overall MMS, key strategies were developed that would provide the framework and methodology to support the Mobility-as-a-Service vision. They included alignment with the Metrolinx Big Move and Regional Express Rail plans, coordination of regional urban mobility, customer-centric technology based services, integration of mobility options, and support for transit-oriented growth.

Figure i-1 Transit Priority Mobility Network to 2041
Source: Mobility Management Strategy for Halton (2016)

The strategy built upon the strengths of the existing transportation networks in Halton (Provincial, Regional, and Local) to support the strategic integration of Major Transit Station Areas (MTSAs) and focus on enhancing connectivity amongst the Local municipal and intra/inter-regional transit networks. To support these connections, the MMS established a Region-wide grid network of approximately 156 km of Transit Priority Corridors (TPCs) and approximately 36 km of Mobility Links. This network is referred to as the Transit Priority Mobility Network to 2041. These corridors build upon the Higher Order Transit Corridors identified in the Regional Official Plan and TMP documents, with some additions and extensions.

The network is to serve as a key connector to link people to existing and planned Regional destinations including Urban Growth Centres (UGCs), Mobility Hubs, MTSAs, employment lands, and abutting municipal connections to the City of Mississauga, the City of Brampton, and the City of Hamilton. The Transit Priority Mobility Network to 2041 is illustrated in Figure i-1, as presented in the MMS, and includes the TPCs and Mobility Link Corridors as outlined below:

Transit Priority Corridors as illustrated in the MMS

A network of east/west and north/south TPCs were recommended within the transportation network where either corridor improvements were possible, higher order transit corridors were identified (as per ROPA 38/TMP) and/or Regional road corridor widening was programmed by 2031.

Each TPC offers the opportunity to implement transit supportive infrastructure such as Transit Signal Priority (TSP), queue jump lanes, bus shelters, and other transit stop improvements. A road corridor widening offers the opportunity to consider High Occupancy Vehicle (HOV) lanes or Bus Rapid Transit (BRT) lanes in order to provide transit with the opportunity to bypass auto traffic as well as improve travel speed and reliability for buses using the corridor. As shown in Figure i-1, the MMS identified the following eleven (11) TPCs:

- Appleby Line (Regional Road 20) from Fairview Street/Appleby GO Station to Highway 407;
- Brant Street (Regional Road 18) from James Street to Dundas Street (Regional Road 5);
- Britannia Road (Regional Road 6) from Tremaine Road (Regional Road 22) to Highway 407;
- Bronte Road/Regional Road 25 from Bronte GO Station to Steeles Avenue (Regional Road 8);
- Derry Road (Regional Road 7) from Tremaine Road (Regional Road 22) to Highway 407;
- Dundas Street (Regional Road 5) from Brant Street (Regional Road 18) to Winston Churchill Boulevard (Regional Road 19);
- Harvester/Wyecroft/Speers/Cornwall from Brant Street (Regional Road 18) to Winston Churchill Boulevard (Regional Road 19);
- Main Street (Milton) from Ontario Street to James Snow Parkway (Regional Road 4), and James Snow Parkway (Regional Road 4) from Main Street (Milton) to Steeles Avenue (Regional Road 8);
- Plains Road/Fairview Street from Brant Street (Regional Road 18), westerly in to Hamilton;

- Steeles Avenue (Regional Road 8) from Ontario Street to Winston Churchill Boulevard (Regional Road 19); and
- Trafalgar (Regional Road 3) from Midtown Oakville GO Station to Georgetown GO Station.

Mobility Links as illustrated in the MMS

Mobility Links are corridors that would serve as a local service/inter-municipal connection to provide increased customer accessibility to important inter-municipal destinations (i.e. social services, employment areas) through a variety of potential transit options, including those beyond traditional fixed route transit services. As shown in Figure i-1, the MMS identifies two Mobility Link Corridors which include:

- Neyagawa Boulevard/James Snow Parkway (Regional Road 4) from Upper Middle Road (Regional Road 38) to Milton GO Station; and
- Regional Road 25 from Milton GO Station to Acton GO Station

Regional Transit Nodes

Regional Transit Nodes are identified in the Transit Priority Mobility Network to 2041 in the MMS. Transit Nodes are characterized similarly to Metrolinx's definition of Mobility Hubs, which are MTSAs at key intersection points on a TPC. Regional Transit Nodes are particularly significant and identified for their combination of supporting transit service and connections as well as the elevated development potential. Regional Transit Nodes have several key goals, including:

- Connecting major centres (key destinations, employment areas and UGCs);
- Enhancing the connection between local and inter-regional transit networks;
- Supporting transit-oriented urban growth where people can live, work, shop, and play; and
- Integrating multiple mobility options to facilitate convenient, safe, and sustainable access to local and inter-regional transit service.

The MMS recommended undertaking further study to assess all MTSAs in Halton Region to understand the infrastructure required to unlock their potential for economic growth, support the expectations of RER, and provide connection to the region wide grid network. This includes an assessment of the Region-wide grid network and its connection to the MTSAs to identify opportunities to facilitate regional connectivity between planned regional destinations. The focus would be on the transportation grid network, first mile/last mile connections, and identifying the infrastructure necessary to support the TPCs and Mobility Links to unlock the economic potential around the MTSAs in Halton Region. Investing in areas where population growth will be focused, such as the MTSAs and the TPCs that provide connectivity between these areas, is part of the Region's strategy for managing growth.

The Defining Major Transit Requirements (DMTR) in Halton Study is a continuation and fulfillment of the next steps established through the MMS in support of the vision for a multi-modal transportation network. The focus of the DMTR is on Regional infrastructure investment to support transit. It builds upon the existing MMS work to align with efforts initiated at the Provincial, Regional, and Local levels to support transit implementation. It also builds on the Region's planned capital improvements.

The DMTR study evaluates the existing and proposed regional transit nodes, higher order transit stations and surrounding areas that are planned for intensification and act as important nodes in the overall functionality from a Halton Region perspective. The analysis of the nodes will provide guidance for unlocking the development potential in the study areas by identifying high level opportunities to improve access, and facilitate necessary first mile/last mile connections to the TPCs. Similarly, the analysis of the TPCs identified the transit infrastructure required to support travel which will serve as key connectors to link people to existing and planned regional destinations.

2 | STUDY PURPOSE AND OBJECTIVES

The Region's strategy for managing growth includes investing in areas where population growth will be focused and supported by TPCs that provide connectivity between these areas. A key piece of this strategy is identifying where Regional infrastructure investment needs to occur in order to unlock transit oriented growth and how mobility and connections can be enhanced between Regional growth areas, adjacent municipalities, and across the GTHA. As such, the DMTR builds upon the next steps of the MMS with two interrelated objectives:

- Evaluate the existing and proposed MTSAs, higher order transit stations and surrounding areas that are planned for intensification to identify infrastructure gaps, potential barriers to development and potential opportunities; and
- Define the type, form, and function of the TPCs as identified in the MMS, in order to identify transit infrastructure investment opportunities for addressing potential transit demand to enhance transportation mobility and connectivity between existing and proposed MTSAs.

The recommendations for improvements within the MTSAs are identified as conceptual and do not preclude the Local and Regional plans and studies, currently on-going or proposed to be undertaken. For the purposes of this study, the assessment was completed for only the MMS identified Regional Transit Nodes (i.e. MTSAs) with connections to existing and/or proposed GO rail stations and GO bus terminals. The findings and recommendations from the study will be used to inform on-going and future planning work through the Regional Official Plan Review (ROPR) and the upcoming Multi-Modal Transportation Master Plan (MMTMP) by providing an understanding of infrastructure investment needs at a Region-wide transportation network level to unlock the economic and growth potential of the MTSAs and TPCs. Prioritization of Regional infrastructure investments will occur through the Region's ROPR and MMTMP.

3 | BACKGROUND AND CONTEXT

In order to accommodate growth in a sustainable manner, population and employment will need to be directed to where infrastructure investments exist, are planned, or can be accommodated in an efficient manner. The Region has recently begun the ROPR process in conformity with the Growth Plan for the Greater Golden Horseshoe (Growth Plan) 2019, which includes updates to the region-wide growth projections to 2041 and strategies for managing growth.

A key piece of the DMTR study is identifying where Regional investments need to occur in order to unlock transit-oriented growth, and identify how mobility and connectivity in the transportation network can be enhanced between growth areas within the Region, with adjacent municipalities, and across the GTHA.

The Existing Transportation Network

Halton Region is responsible for planning, constructing, operating, maintaining, and improving a network of Major Arterial roads which accommodate all modes of travel and allows for the transport of goods and people in a safe and efficient manner. The Regional road system connects the Region's rural and urban centres and provides connectivity to the Provincial highway system including: Highways 7, 401, 407, and the Queen Elizabeth Way (QEW)/403.

The Local municipalities are responsible for all other roads which include minor arterials, multi-purpose arterials, collectors, and local roads within the road network. These roads are the primary access to local communities, and provide connection to Major Arterial and Provincial facilities.

Understanding the common travel patterns in the Region is critical to identifying transportation needs and understanding the connectivity required to support a multi-modal transportation network that supports all modes of transportation. Travel patterns within Halton, and between Halton, are documented in the Transportation Tomorrow Survey (TTS). The TTS is a survey conducted every five years by the Province of Ontario and public agencies in southern Ontario to collect information about urban travel to support transportation planning and investment decisions. The 2016 TTS will be input into the upcoming MMTMP.

The 2016 TTS reported 1.4 million trips made to, from, and within Halton Region on an average day, with approximately 350,000 in the AM peak and 410,000 in the PM peak. In the AM peak, approximately 48% (170,000 trips) of total trips were within Halton and 52% (180,000 trips) were to and from other municipalities. In the PM peak, approximately 52% (210,000 trips) of total trips were within Halton and 48% (200,000 trips) were to and from other municipalities.

For trips between the Halton municipalities, the largest interaction was between the City of Burlington and the Town of Oakville. Approximately 15,000 to 18,000 trips occur between the two municipalities in the peak periods (AM and PM), with more trips going east into Oakville in the AM and more trips going west into Burlington in the PM. The data identified the importance of east-west connectivity of all modes of transportation including transit between these two communities. This formed the basis

of the recommendation in Report No. PW-34-18 to seek authorization to apply the Move Ontario 2020 Quick Wins Funding to the extension of Wyecroft Road including the bridge over Bronte Creek.

A key piece of the DMTR is to identify the infrastructure to support transit to enhance transportation mobility and connectivity within and between the municipalities.

Importance of Transit Oriented Growth

Transit-Oriented Development (TOD) refers to planning for focused growth around Regional Transit Nodes and Corridors in a compact, mixed-use form. Transit-Oriented Developments are generally located within walking distance of a transit station in a pedestrian-oriented environment.

TOD in Halton Region would mean that growth is concentrated around areas that are served by higher order transit such as the MTSAs, Regional Transit Nodes, and TPCs. In those areas, where appropriate and directed through approved Regional and Local Official Planning documents, there will be a shift to more mixed-use developments with higher densities to provide opportunities to live and work within walking distance of a station. Regional and local policies will have to be aligned in order to facilitate future growth at MTSAs. Coordinated efforts to address existing infrastructure gaps and implement improvement projects would be a key priority.

TOD would also advance regional mobility and include a suite of mobility options including walking, cycling, and transit. MTSAs will evolve to be comprehensive hubs where transfer between different transportation modes is seamless. In many MTSAs, a finer network of pedestrian-oriented streets could be introduced where appropriate and feasible to offer safe and convenient walking and cycling connections to the station. Ease of access to transit and the ability to travel to key destinations would position transit as an attractive choice of travel mode and as a reliable and convenient alternative to driving a car.

A number of MTSAs in the Region, such as Midtown Oakville GO and Burlington GO, are already on their way to becoming significant hubs. The Region's MTSAs will provide dense and connected communities that will contribute to creating high quality urban places in the Region where people will want to live, work, and visit.

Planning Policy Context

Provincial Plans

A number of planning documents have been prepared by the Province of Ontario focusing on preparing the GTHA for growth and sustainability by providing guidance and plans for transit (including RER). The policies and plans promote multi-modal connectivity to ensure a functioning, efficient, and well-planned transportation system to accommodate the projected population and economic growth. These studies provide a regional context and were considered as background to the DMTR study.

The Metrolinx 2041 Regional Transportation Plan (RTP)

In March 2018, Metrolinx released the 2041 Regional Transportation Plan (RTP) for the Greater Toronto and Hamilton Area, a strategic document that outlines the actions and strategies for the transportation system for the next 25 years. The document is an update to the Big Move, 2008. The 2041 RTP focuses on the development of GO RER, providing two-way, all-day service on the existing GO rail system that would expand service to Halton and place strong emphasis on transit stations along the Lakeshore West and Milton GO Line.

The Plan is divided into 5 strategies:

- Complete the delivery of current regional transit projects. This includes 15 transit projects that are currently under construction or in engineering design (in-delivery), including GO RER;
- Connect more of the region with frequent rapid transit. This would include expanding RER, identifying regional express bus routes, and identifying priority bus corridors to create a Frequent Rapid Transit Network (FRTN);
- Optimize the transportation system by integrating mobility services and fares, to create a seamless travel experience from one transit system to another;
- Integrate transportation and land use around Mobility Hubs and MTSAs to support walking, cycling, and transit in key nodes; and
- Prepare for an uncertain future through adapting to policy and regulations for new technology and being resilient to the impacts of climate change.

The RTP identified a complete 2041 FRTN (as shown on Figure i-2), which includes a number of the TPCs identified in the MMS. This includes:

- Bronte Road/Regional Road 25 as a Priority Bus Corridor connecting Milton GO to Bronte GO;
- Derry Road as a Priority Bus Corridor connecting Milton GO to Mississauga and Toronto;
- Dundas Street as a Priority Bus Corridor from Brant Street to Trafalgar Road (known as the Dundas West Priority Bus) and as a Bus Rapid Transit (BRT) Corridor east of Trafalgar Road, connecting to Mississauga and Toronto at Kipling Station (known as Dundas BRT) ;
- Harvester/Speers/Cornwall corridor as a Priority Bus Corridor connecting Aldershot GO to Port Credit GO (includes Wyecroft Road);
- Trafalgar Road as a Priority Bus Corridor from Derry Road to Highway 407 and as a BRT from Highway 407 to the Midtown Oakville GO; and
- Brant Street as a Priority Bus Corridor connecting the UGC in Downtown Burlington to Dundas Street.

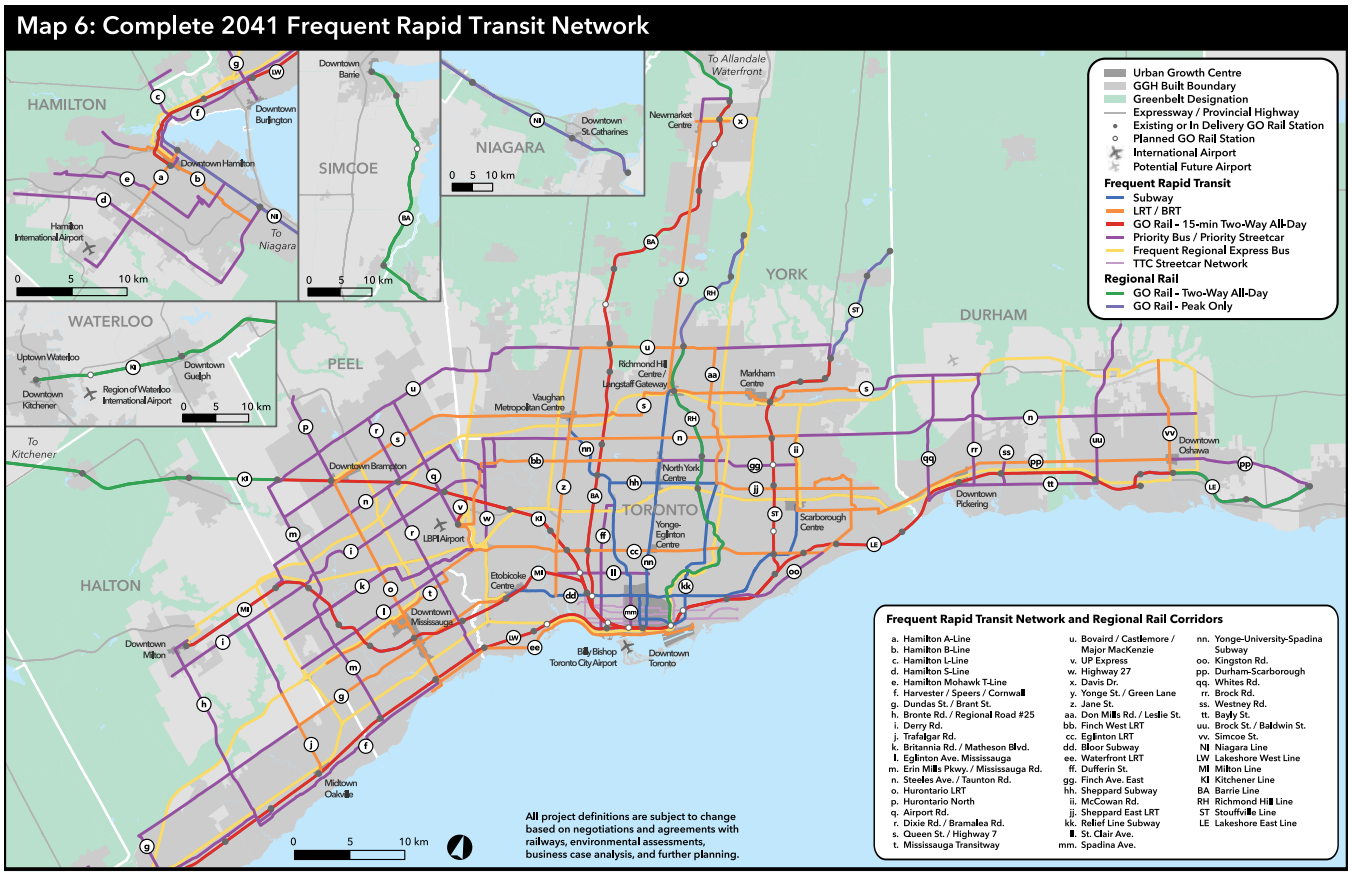

Figure i-2 Complete 2041 Frequent Rapid Transit Network
Source: Metrolinx 2041 Regional Transporation Plan (2018)

The Growth Plan for the Greater Golden Horseshoe (2019)

The Growth Plan (2019) identifies and defines MTSAs as areas around any existing or planned higher order transit station or stop. The Growth Plan requires planning for a minimum intensification target of 150 people and jobs per hectare for MTSAs served by GO Transit on a Priority Transit Corridor as identified on Schedule 5 of the Growth Plan (i.e. Lakeshore West Line to Burlington GO). The Growth Plan also directs that UGCs will be planned to achieve a target of 200 people and jobs per hectare by 2031. The Growth Plan also directs planning and designing of MTSAs to meet the minimum density target and to achieve multi-modal access to stations. The Region, as part of the ROPR, in consultation with the Local municipalities, is directed to delineate the boundaries and assign growth targets to the MTSAs.

Milton GO, Midtown Oakville GO, and Burlington Downtown are UCGs in the Growth Plan, and are primary areas within the Region for directing significant high-density employment and population growth, major transit infrastructure, and a mix of land uses such as commercial, recreational, cultural, entertainment, institutional, and public services.

The three UGCs, along with Burlington GO MTSA, are also designated as Mobility Hubs in the Metrolinx RTP. Mobility Hubs are planned to have an attractive and intensive concentration of employment, living, shopping, and availability of a wide range of enjoyment around the stations. Although Burlington Downtown is not a GO station and consists of a bus terminal, the node is located in close proximity (within 1.5 kilometres) of Burlington GO station. Since Burlington Downtown is a primary core for residential and employment growth, alongside Burlington GO, it is recognized as a Mobility Hub.

Regional Plan

Halton Region's Official Plan (ROPA 38)

Halton Region's Official Plan (ROPA 38) identifies the three UGCs (Midtown Oakville, Downtown Burlington, and Milton GO) and Burlington GO as Mobility Hubs, as well as four existing and proposed Major Transit Stations. Two additional future GO rail stations have been identified through other plans and studies.

Existing UGCs/MTSAs/Mobility Hubs:

- Aldershot GO
- Burlington GO (Mobility Hub)
- Burlington Downtown (Urban Growth Centre, Mobility Hub)
- Appleby GO
- Acton GO
- Georgetown GO
- Milton GO (Urban Growth Centre, Mobility Hub)
- Bronte GO
- Midtown Oakville GO (Urban Growth Centre, Mobility Hub)

Proposed MTSAs & Future GO Rail Station:

- Trafalgar GO (Proposed Major Transit Station in ROPA 38)
- Tremaine (Identified in the Town of Milton 2009-2013 Strategic Plan for Transit Services)
- Walkers Line (Identified in the Metrolinx New Station Analysis - Initial Business Case (2016))

A number of studies have been undertaken at the local and provincial levels regarding the MTSAs, including the Town of Oakville's Midtown Municipal Class Environmental Assessment (MCEA) study, and the Georgetown GO Secondary Plan. In addition, there are on-going works through the City of Burlington's Mobility Hub Study Secondary Plans, the Milton Mobility Hub study, the Trafalgar Corridor and Agerton Employment Area Secondary Plans, and the Bronte GO MTSA study.

4 | MAJOR STATION AREAS RECOMMENDATIONS

This study included the completion of a gap analysis of the MTSAs, which sets the stage for the Region to further review and delineate the MTSAs as part of the on-going ROPR. This study supports the Region's vision for achieving a multi-modal regional transportation network that supports all modes including connectivity between MTSAs, nodes, and UGCs through the Region's TPCs.

MTSAs and UGCs/Mobility Hubs are important Regional Transit Nodes within Halton, and where a major portion of growth and intensification in Halton will occur. The existing and proposed MTSAs in Halton (identified as Regional Transit Nodes in the MMS) can be grouped into categories based on their overall role and functionality from a Regional perspective, their relationship to the TPCs and Region-wide growth, and each with their own priorities and infrastructure opportunities. The Major Transit Stations act as important nodes in the overall function from a Regional perspective and have important inter-relationship to the Transit Priority Mobility Network which provides regional connectivity between the nodes through the TPCs. Through the gap analysis, the MTSAs were grouped into the following categories based on their Regional functionality, characteristics, and the opportunity to provide enhanced mobility and connectivity throughout the Region.

UGCs/Mobility Hubs

As primary transit hubs and growth areas in the Region, priorities for UGCs/Mobility Hubs (Downtown Burlington, Burlington GO, Midtown Oakville, and Milton GO) include:

- Investing in infrastructure to increase active transportation connectivity to/within the station area by including potential grade separated crossings over the rail corridors to improve station access where feasible;
- Facilitating transit efficiency through installing measures that prioritize transit movement; and
- Ensuring capacity for increased ridership at the station and facilitating seamless transfer between different transportation modes, including support for first mile/last mile connections.

In addition to the above priorities, for Downtown Burlington, strengthening transit and active transportation connections to the Burlington GO station is an important consideration to provide regional rail access to existing and future population.

A significant amount of planning has already taken place for Midtown Oakville GO including the Midtown MCEA Study. Implementation of the planned MCEA Study network is the priority for Midtown Oakville GO, especially with the station being located at the intersection of two TPCs, Trafalgar Road, and the Plains Road/Harvester Road/Wyecroft Road/Speers Road/Cornwall Road Corridor.

Station expansion is planned for Milton GO with new parking lots on the south side of the track. Milton GO is currently heavily utilized, and therefore, station expansion is important in increasing the station's capacity and supporting current and future development in the station area.

MTSAs with Plans for 15-minute All-day Two-way Regional Express Rail Service

MTSAs on the Lakeshore West GO rail corridor are planned to be served by 15-minute, full-day, two-way rail service by 2025 (Bronte GO, Appleby GO, Aldershot GO). Transit-oriented mixed-use communities are envisioned at these MTSAs, with some potentially being employment-focused nodes. These MTSAs generally have large employment areas within the study area boundary. Given that mixed use growth cannot currently take place in employment areas, redesignation of land uses may be considered through the ROPR, and will also inform the delineation of MTSA boundaries.

Most MTSAs along the Lakeshore West GO rail corridor are situated at the intersection of two TPCs. As illustrated in Figure i-1, these MTSAs become important access points to the inter- and intra-regional transportation network.

As future transit-oriented mixed-use nodes with frequent regional rail service, priorities for MTSAs with plans for 15-minute all-day two-way RER service are:

- Introducing fine-grained street patterns, where feasible, within the station area that currently have large city blocks due to the large-scale employment and industrial uses;
- Improving first mile/last mile connections to provide safe and direct walking/cycling routes, and active transportation facilities such as bicycle parking and safe crossings; and
- Facilitating efficient transit movement in and out of the station to support increased ridership anticipated with RER, through measures such as installing TSPs at key locations.

MTSAs Serving a Broader Geographical Area

The Georgetown GO and Acton GO MTSAs are situated within low density residential areas. In terms of their regional transportation function, however, these stations provide regional rail connections to wide rural and suburban areas in northern Halton Region.

As key access points to regional transit in northern Halton Region, priorities for MTSAs servicing a broader geographical area are:

- Ensuring transit connections to the areas that the station serves;
- Enhancing station access for all modes, including increasing the parking supply at the station; and
- Establishing safe and direct active transportation connections from adjacent neighbourhoods, and adding active transportation facilities such as signage and sheltered bicycle parking near the GO station.

Both Georgetown GO and Acton GO MTSAs are located within historic core and stable neighbourhoods contexts. Acton GO MTSA has servicing constraints within the station area, presenting challenges for

the Growth Plan (2019) target of 150 people and jobs per hectare to be met. Given these physical constraints for population growth in these MTSAs, intensification should be focused in strategic growth areas and immediately adjacent to the GO station. Alternate targets may need to be set through the ROPR process should the station be considered for delineation as part of the review.

Opportunities for New Station Areas

Three proposed/future stations were assessed as a part of this study. Trafalgar station is a proposed Major Transit Station in ROPA 38, and Tremaine and Walkers Line stations are Future GO Rail Stations proposed through other studies. The vision for the Trafalgar station is a high density employment-focused node supported by rail transit, whereas Tremaine station is envisioned as a commuter station to alleviate parking demand at existing stations and to support other key growth areas in the Region such as the Milton Education Village.

Trafalgar station is proposed to be located near the intersection of two TPCs. A feasibility study for the station has been completed by the Town and provided to Metrolinx for consideration. If realized, the station would support high density mixed-use intensification along Trafalgar Road, and add a new transit oriented mixed-use node within the Region. The policy and physical constraints to the station's realization include a utility corridor that runs to the north of the rail corridor, a need for employment conversions, and a potential urban boundary expansion as part of the ROPR.

Walkers Line station was previously considered by Metrolinx as a part of an Initial Business Case for future stations. If realized, Walkers Line station will add an employment-focused node along the Lakeshore West GO line with plans for 15 minute all-day two-way rail service by 2025.

Although not envisioned as a growth area, the Tremaine station will support the unlocking of growth potential at Milton GO station by providing an alternative station on the Milton GO rail line for commuter riders on the west side of the Region. The study area on the south side of the rail consists of Escarpment protected area, which is a constraint that would need to be addressed for the station to be realized. If built, the station will become the new terminus on the Milton GO rail line, and will support other growth and employment nodes including Milton Education Village.

5 | DEFINING TRANSIT PRIORITY CORRIDORS

The second objective of the DMTR study is to define the type, form, and function of the TPCs as identified in the MMS, in order to identify infrastructure investment opportunities for addressing potential transit demand to enhance transportation mobility and connectivity between the MTSAs. The approach undertaken to identify type, form, and function for the 2031 and 2041 horizons was an iterative process that resulted in preliminary recommendations for where, what, and when infrastructure investment opportunities for transit are required. It should be noted that the results of this analysis will be used as input to the ROPR and the next Regional MMTMP and will be subject to further refinement.

Transit Priority Corridor Type

The type of TPC refers to the level/type of priority being considered for transit in a corridor which can range from mixed traffic to Bus Rapid Transit (BRT). For this study, transit priority type has been organized into the following hierarchy: Mixed Traffic, Priority Bus, and BRT Corridors. Each corridor type was defined with the following characteristics:

- Mixed Traffic Corridor– operates within general purpose travel lanes and gives transit and auto traffic an equal amount of priority.
- Priority Bus Corridor – offers higher priority to transit through transit priority infrastructure. Priority bus can operate within general purpose travel lanes in mixed traffic or within High Occupancy Vehicle (HOV) lanes. In general purpose lanes, priority is given through queue jump lanes and TSP.
- Bus Rapid Transit Corridor – Offers the highest priority to transit as it operates in a dedicated transit lane which allows for improved reliability, reduced travel time, and allows for shorter headways to increase corridor capacity.

Transit Priority Corridor Form

The form of a TPC defines the physical infrastructure required in a corridor. The range of transit priority form/infrastructure that is considered is summarized below:

Mixed Traffic Corridor

- General Purpose Lanes – requires no additional physical infrastructure as transit operates in mixed traffic conditions.

Priority Bus Corridor

- Transit Signal Priority (TSP) – a technique which helps provide priority to transit by minimizing delay at signalized intersections. This generally involves optimizing signal timing at signalized intersections or can be through signal coordination along the length of a corridor. Typical

TSP techniques include extended green time, a dedicated transit phase, and transit vehicle detection which induces a green signal.

- Queue Jump Lanes – a physical improvement to a signalized intersection which gives priority to transit vehicles. Infrastructure involves an extra lane on the approach or on both sides of an intersection and are typically restricted to buses only. They allow for transit vehicles to pull ahead of vehicular queues at intersections. Queue jumps are usually used in conjunction with TSP through a transit only phase to allow transit vehicles to pass other queued vehicles.
- High Occupancy Vehicle (HOV) Lanes – allow for bus operations to be shared with HOVs (e.g. 2+ vehicle occupancy). A 6-lane cross section provides the opportunity to incorporate HOV lanes on the outside lane. These lanes can be indicated by signage and can be enforced during specific days and time periods.

Bus Rapid Transit Corridor

- Dedicated BRT Lanes – lanes which are restricted to transit vehicles only. They are typically accommodated within a 6-lane cross section and are needed for a BRT corridor. BRT lanes can be located in the median lanes or outside curb lanes for a corridor.

Figure i-3 defines the form (e.g., infrastructure) for the three types of corridors.

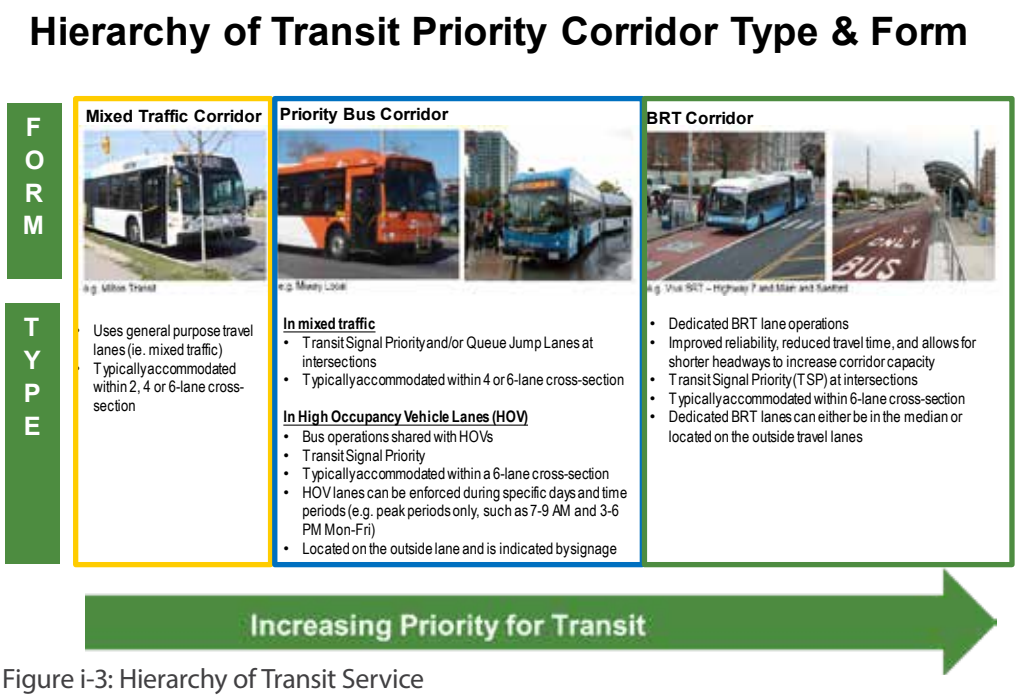

Figure i-3: Hierarchy of Transit Service

Transit Priority Corridor Function

The final element is to define the function of a TPC in order to determine the ridership potential of a corridor. Function typically refers to the operating characteristics of the transit service. Two types of transit function are considered in the analysis: All-Stop Service and Express Service.

- All-Stop Service – serves shorter distance travel as it provides frequent stops, usually providing two to four stops per kilometre.
- Express Service – serves longer distance travel as the bus stops are at key intersections or destinations along its route, usually providing one to two stops per kilometre.

It is important to note that the function of the TPC was defined for analysis purposes only.

Typical Ridership Demand

Transit ridership is influenced not only through the type, form, and function of a transit corridor, but through a variety of factors. These include:

- Land Use – the type of land use and density surrounding a corridor is key in supporting a TPC. Typically, corridors with high densities will result in higher potential ridership demand and will require more priority for transit in a corridor.
- Vehicular Traffic Volumes – vehicular traffic on a corridor is an important consideration to ridership. If there is significant delay on a corridor, investing in transit priority infrastructure will result in transit becoming a more attractive mode of travel, resulting in higher potential transit ridership demand.
- Right-of-Way (ROW) – corridors with larger ROWs, and therefore more travel lanes, have the opportunity to support infrastructure that gives higher priority to transit. To give priority to transit on a 4-lane corridor, queue jump lanes and TSP would typically be implemented, whereas a 6-lane corridor has the opportunity to support HOV lanes or dedicated travel lanes (i.e. BRT) which will result in higher potential transit ridership demand.

6 | PRELIMINARY 2031 AND 2041 RECOMMENDED TRANSIT PRIORITY CORRIDOR NETWORKS

This study included the completion of an analysis of the corridors identified in the MMS using the definitions of type, form, and function to further define the corridors from a transit infrastructure perspective. An iterative analysis was undertaken to assess the potential transit ridership demand on each corridor. The identification of transit infrastructure supports the shift toward a multi-modal approach to transportation.

The Preliminary 2031 Recommended Transit Priority Corridor Network and summary of the associated transit supportive infrastructure is show on Figure i-4 and comprised of the following:

2031 North-South Corridors:

Mixed Traffic Corridor

- Appleby Line – Highway 407 to Appleby GO
- Brant Street – Burlington GO to Downtown Burlington
- James Snow Parkway – Britannia Road to Upper Middle Road
- Regional Road 25 – Acton GO to Milton GO

Priority Bus Corridors

- Trafalgar Road – Georgetown GO to Steeles Avenue (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Trafalgar Road – Steeles Avenue to Midtown Oakville GO (HOV lanes and Transit Signal Priority)
- Bronte Road/Regional Road 25 – Milton GO to Bronte GO (HOV lanes and Transit Signal Priority)
- James Snow Parkway – Milton GO to Britannia Road (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Brant Street – Dundas Street to Burlington GO (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)

2031 East-West Corridors:

Mixed Traffic

- Steeles Avenue – Milton GO to Halton/Peel Boundary
- Derry Road – Tremaine Road to Regional Road 25

- Britannia Road – Tremaine Road to Regional Road 25
- Dundas Street – Halton/Hamilton Boundary to Brant Street

Priority Bus Corridors

- Derry Road – Regional Road 25 to Halton/Peel Boundary (HOV Lanes and Transit Signal Priority)
- Britannia Road – Regional Road 25 to Halton/Peel Boundary (HOV Lanes and Transit Signal Priority)
- Dundas Street – Brant Street to Bronte Road/Regional Road 25 (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Dundas Street – Bronte Road/Regional Road 25 to Halton/Peel Boundary (HOV Lanes + Transit Signal Priority)
- Plains Road/Harvester Road/Wyecroft Road/Speers Road/Cornwall Road – Halton/Hamilton Boundary to Halton/Peel Boundary (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)

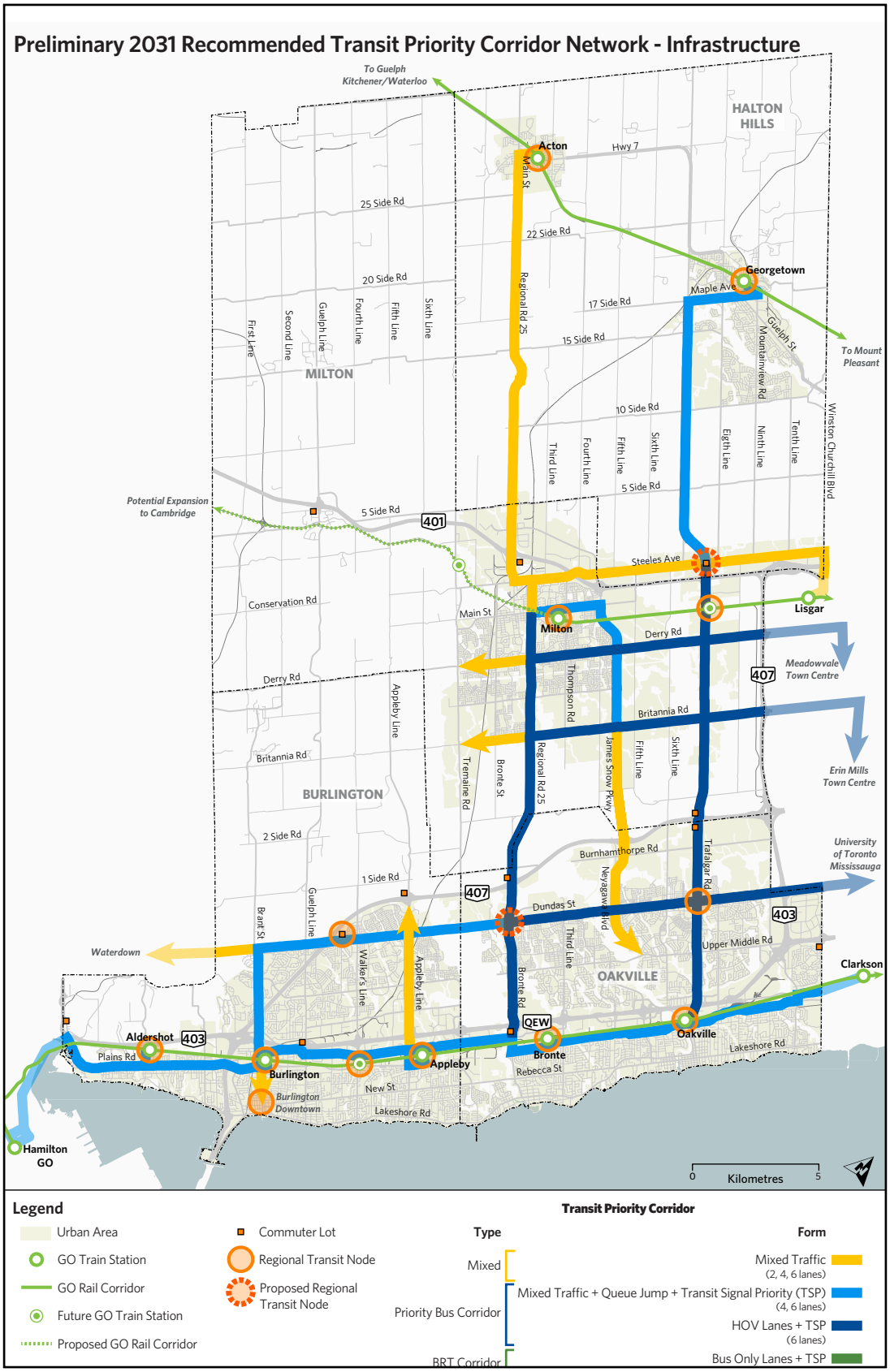

Figure i-4: Preliminary 2031 Recommended Transit Priority Corridor Network

For Mixed Traffic Corridors, it was assumed that no new infrastructure would be required as transit would be operating in mixed traffic conditions.

In terms of infrastructure, it was assumed that a Priority Bus Corridor would require TSP at all intersections, as well as queue jump lanes at intersections where buses would be operating in mixed traffic. It was also assumed that stations with some amenities, including bus shelters with heating, lighting, indoor and outdoor benches, bike racks, and information pylon with real-time information system would be required for all Priority Bus Corridors.

As noted previously, a 6-lane Priority Bus corridor offers the opportunity to consider HOV lanes to provide further priority to transit in addition to TSP. HOV lanes were recommended on Trafalgar Road from Steeles Avenue to the Midtown Oakville GO, on Bronte Road/Regional Road 25 from the Milton GO to the Bronte GO, and on Derry Road, Britannia Road, and Dundas Street all from Regional Road 25 to the Halton/Peel Boundary. It should be noted that the opportunity for the implementation of HOV lanes would be subject to further study and review through the upcoming MMTMP.

Similar to the 2031 horizon, an iterative analysis was undertaken to assess the potential transit ridership demand on each corridor for 2041. Additional demands on the transportation network resulted in increased potential ridership in 2041, which in turn resulted in additional infrastructure requirements to four corridors: Appleby Line from Highway 407 to the Appleby GO and Steeles Avenue from the Milton GO to the Halton/Peel Boundary are both Priority Bus Corridors in 2041 and Trafalgar Road from Highway 407 to the Midtown Oakville GO and Dundas Street from Bronte Road/Regional Road 25 to the Halton/Peel Boundary are both identified as BRT Corridors in 2041. The Preliminary 2041 Recommended Transit Priority Corridor Network is shown in Figure i-5 and is comprised of the following (note that the **BOLDED** corridors denote a **change** from the Preliminary 2031 Recommended Transit Priority Corridor Network):

2041 North-South Corridors:

Mixed Traffic Corridors

- Brant Street – Burlington GO to Downtown Burlington
- James Snow Parkway – Britannia Road to Upper Middle Road
- Regional Road 25 – Acton GO to Milton GO

Priority Bus Corridors

- Trafalgar Road – Georgetown GO to Steeles Avenue (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Trafalgar Road – Steeles Avenue to Highway 407 (HOV Lanes and Transit Signal Priority)
- Bronte Road/Regional Road 25 – Milton GO to Bronte GO (HOV Lanes and Transit Signal Priority)

- James Snow Parkway – Milton GO to Britannia Road (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Brant Street – Dundas Street to Burlington GO (Mixed Traffic + Queue Jump Lanes + Traffic Signal Priority)
- **Appleby Line – Highway 407 to Appleby GO (Mixed Traffic + Queue Jump Lanes + Traffic Signal Priority)**

Bus Rapid Transit (BRT)

- **Trafalgar Road – Highway 407 to Midtown Oakville GO**

2041 East-West Corridors:

Mixed Traffic

- Derry Road – Tremaine Road to Regional Road 25
- Britannia Road – Tremaine Road to Regional Road 25
- Dundas Street – Halton/Hamilton Boundary to Brant Street

Priority Bus Corridors

- **Steeles Avenue – Milton GO to Halton/Peel Boundary (HOV Lanes and Transit Signal Priority)**
- Derry Road – Regional Road 25 to Halton/Peel Boundary (HOV Lanes and Transit Signal Priority)
- Britannia Road – Regional Road 25 to Halton/Peel Boundary (HOV Lanes and Transit Signal Priority)
- Dundas Street – Brant Street to Bronte Road/Regional Road 25 (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)
- Plains Road/Harvester Road/Wyecroft Road/Speers Road/Cornwall Road – Halton/Hamilton Boundary to Halton/Peel Boundary (Mixed Traffic + Queue Jump Lanes + Transit Signal Priority)

Bus Rapid Transit

- **Dundas Street – Bronte Road/Regional Road 25 to Halton/Peel Boundary**

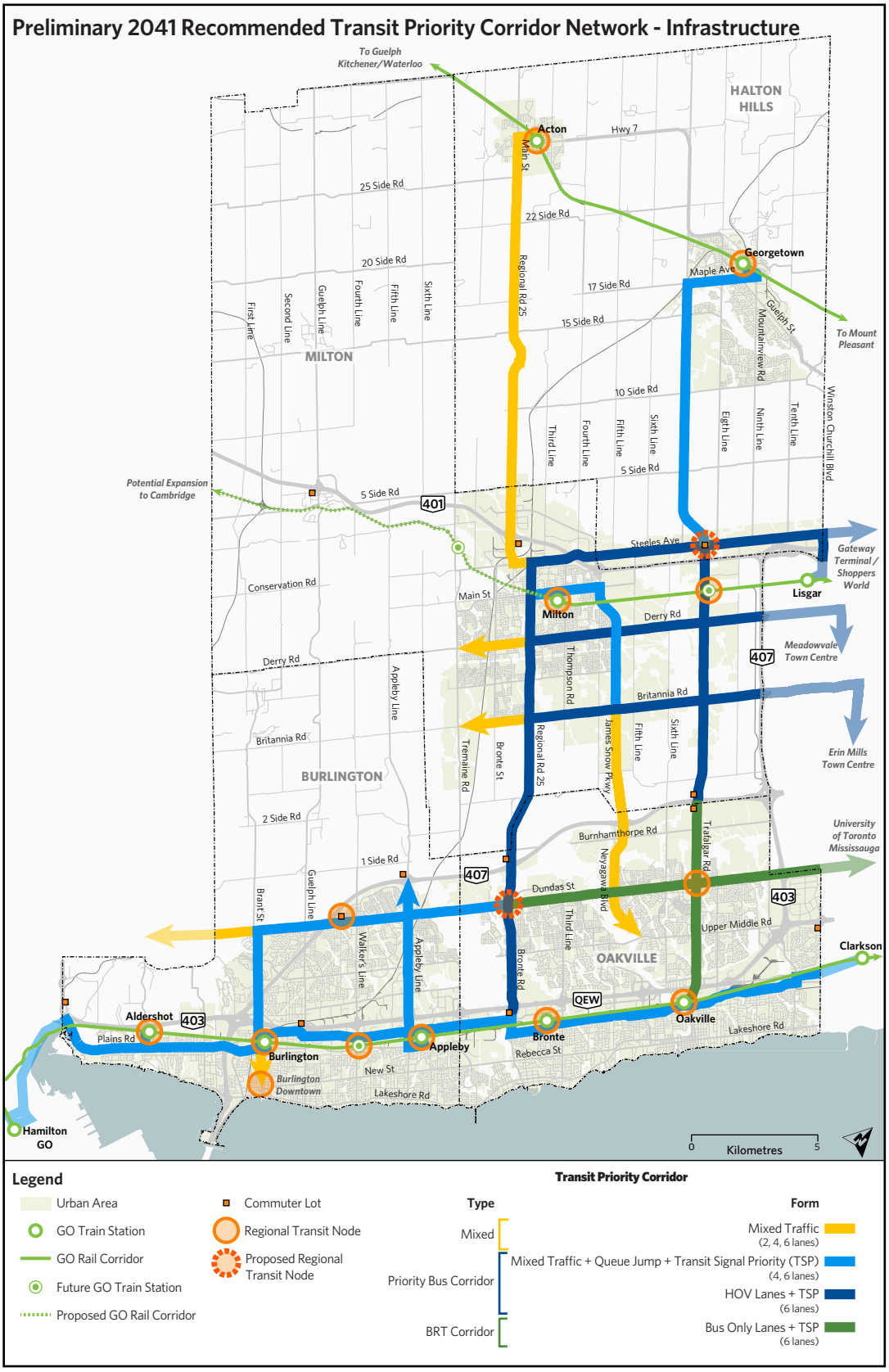

Figure i-5: Preliminary 2041 Recommended Transit Priority Corridor Network

In 2041, Mixed Traffic Corridors continue to require no new infrastructure in mixed traffic conditions.

As with 2031, it was assumed that a Priority Bus Corridor would require TSP at all intersections, as well as queue jump lanes at intersections where buses would be operating in mixed traffic. As previously noted in the 2031 conditions, it was assumed that stations with some amenities would be required for all Priority Bus Corridors.

Also, as noted previously in the 2031 conditions, a 6 lane Priority Bus corridor offers the opportunity to consider HOV lanes to provide further priority to transit in addition to transit signal priority. In addition to the HOV lanes recommended as part of the 2031 network, additional HOV lanes were recommended on Steeles Avenue from Regional Road 25 to the Halton/Peel Boundary as part of the Preliminary 2041 Recommended Transit Corridor Priority Network. As indicated previously, it should be noted that the opportunity for the implementation of HOV lanes would be subject to further study and review through the upcoming MMTMP.

In terms of infrastructure required to implement the BRT Corridors, since stations were included as part of implementing the Priority Bus Corridors, the only infrastructure requirements would be minor in nature, for example, line painting and signage.

Costing

Order of magnitude cost estimates were developed for the transit priority infrastructure and services identified within this report. The costs are divided into infrastructure costs, transit fleet costs, and annual operations and maintenance costs.

In total, the Region's current Capital plan includes over $1 billion in road works (2018 to 2031 funds only) related to the Transit Priority Corridors. Table i-1 shows the additional cost estimated for new transit infrastructure to support the preliminary 2031 and 2041 recommended Transit Priority Networks, which includes approximately $261M in new transit infrastructure by 2031, and further approximate $45M in new transit infrastructure by 2041. New transit infrastructure considers costs such as transit station infrastructure, transit priority infrastructure including TSP, fiber optic communications, and queue jump lanes.

In addition to infrastructure costs, transit fleet requirements for the corridors identified in the network only will require further investment. It is estimated that approximately $117M in fleet will be needed by 2031 and approximately $77M additional by 2041, for a total of approximately $194M (including 25% spares).

Annual costs for transit service operations and maintenance were estimated for discussion purposes only in order to better understand the magnitude of on-going costs associated with the TPCs as part of this study. For anticipated service levels by 2031, annual costs of approximately $39M are estimated. By 2041, the total annual costs for all corridors are expected to increase by approximately $13M for a total of approximately $52M.

Corridor	2031 New Transit Infrastructure Costs with Contingency ($M)	2041 New Transit Infrastructure Costs with Contingency ($M)
Trafalgar Road/Maple Avenue	$47.2	$0.3
Dundas Street	$35.6	$0.5
Plains Road	$24.8	$0.0
Brant Street	$8.9	$0.0
Bronte Road/Regional Rd 25	$32.2	$0.0
Britannia Road	$18.4	$0.0
Derry Road	$17.8	$0.0
Fairview-Harvester-Wye-croft-Speers-Cornwall	$61.7	$0.0
James Snow Park-way/Neyagawa Blvd./Main Street	$13.8	$0.0
Appleby Line	$0.0	$26.0
Regional Road 25 (north)	$0.0	$0.0
Steeles Avenue	$0.0	$17.8
Total	**$260.5**	**$44.6**

Table i-1: Infrastructure Cost Estimates

7 | CONCLUSION AND NEXT STEPS

The DMTR Study is a continuation and fulfillment of the next steps established through the MMS in support of the vision for a multi-modal transportation network.

The study evaluated the existing and proposed MTSAs from a Regional perspective to identify their growth potential as key strategic growth areas. The further planning through delineation and assignment of targets will be refined through the ROPR as the growth allocation to 2041 is completed. The grouping of the MTSAs based on their overall role and functionality within the Halton Region context is important to advance the infrastructure investment needs to support growth, intensification and the demands of Metrolinx Regional Express Rail. The preliminary 2031 and 2041 Recommended Network provides important connections between the MTSAs establishing regional connectivity, and further supporting the expectations and riders of RER and the Metrolinx 2041 Frequent Rapid Transit Network.

To unlock the growth potential of the MTSAs, the analysis identified infrastructure gaps and potential opportunities, including:

- Improving first mile/last mile connections to provide safe and direct walking/cycling routes, and active transportation facilities such as bicycle parking and safe crossings;
- Facilitating efficient transit movement in and out of the station to support increased ridership anticipated with RER, through measures such as installing TSPs at key locations; and
- Ensuring station access for all modes of transportation.

Through an analysis of the TPCs established in the MMS, a preliminary recommended network of transit infrastructure requirements was established for the 2031 and 2041 horizons. This work continues to set the stage for the development of a multi-modal transportation network that supports all modes of transportation.

The preliminary recommended networks, including the MTSA infrastructure improvements noted above are beyond the Region's current Capital Plan (2018 - 2031). This study will be a key input into the ongoing ROPR which will set out how the Region grows to 2041, as well as the upcoming MMTMP. The outcomes of this study should be reviewed within the context of the on-going ROPR as updated population and employment projections become available. As such, further refinements of the network may be identified through the ROPR and the upcoming MMTMP. It is noted that this study reviewed the MTSAs and Transit Priority Mobility Network from a Regional perspective and does not preclude the on-going and future studies undertaken by the Local municipalities.

Finally, this ongoing and future planning work to further refine infrastructure improvements to support transit will need to consider:

- Establishing a vision for a future multi-modal transportation Regional road network (building on the MMS and this DMTR Study);
- Accounting for 2041 population and employment growth recommendations of the ROPR through the upcoming MMTMP process;
- Confirming/refining preliminary findings of this DMTR study including infrastructure recommendations for TPCs through the ROPR and Master Plan process;
- Addressing the opportunity for HOV lane implementation from a Regional road network connectivity perspective, including links to provincial corridors, through the MMTMP; and
- Identifying further studies to be completed with respect to implementation of the TPCs.