5A

Halton Region
Integrated Master Plan

APPENDIX 5A

Transportation Strategy Evaluation

Halton Region

Integrated Master Plan

Water, Wastewater, and Transportation

Transportation Strategy Evaluation

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Halton REGION

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Acronyms and Abbreviations

ATMP	Active Transportation Master Plan
BRT	Bus Rapid Transit
DMTR	Defining Major Transit Requirements
GGH	Greater Golder Horseshoe
GTA	Greater Toronto Area
GTHA	Greater Toronto Hamilton Area
HOV	Higher-Occupancy Vehicles
IGMS	Integrated Growth Management Strategy
IMP	Integrated Master Plan
JBPE	Joint Best Planning Estimates
KPI	Key Performance Indicator
LOS	Level of Service
MTSA	Major Transit Station Area
MTO	Ministry of Transportation Ontario
PPS	Provincial Planning Statement
Region	Halton Region
ROPA 49	Regional Official Plan Amendment 49
TAZ	Traffic Analysis Zone
TMG	Travel Modelling Group
TMP	Transportation Master Plan
TSN	Time Spent on Network
TSP	Transit Signal Priority
TTS	Transportation Tomorrow Survey
VKT	Vehicle Kilometres Travelled
V/C	Volume-to-Capacity

1.0 Introduction

Halton Region has undertaken an Integrated Master Plan (IMP) to develop the next region-wide Water, Wastewater and Multi-Modal Transportation Master Plans. The outcome of this work is a long-term integrated servicing strategy for Regional infrastructure to accommodate future growth to 2051. The IMP provides the strategies and tools required to meet future water, wastewater, and transportation infrastructure needs beyond 2031.

The technical report provides additional information regarding travel demand modelling assumptions, scenario testing, and analysis.

2.0 Halton Region Travel Demand Model

2.1 Model Overview

Halton Region uses a travel demand model to analyze travel demand and forecast the impacts of population and employment growth on the transportation network. The travel demand model is a macroscopic-level travel demand model, which is suitable for strategic, master plan level studies and consistent with industry best practices.

The Halton travel demand model is based upon the Greater Toronto Area (GTA) Model V4 originally developed by the Travel Modelling Group (TMG) at the University of Toronto. The model develops 24-hour travel patterns to aid in forecasting travel patterns and allows testing of different network options for future horizon years. Further information regarding the model structure and background information can be found on TMG's website[1]. The Region's travel demand model also includes three distinct truck classes – light, medium, and heavy. The travel demand model does not assign active transportation demand to the network, as such walking and cycling demand information is not available at the TAZ or network level. Accordingly, the benefits of active transportation are reflected through strategic network improvements and integration with transit infrastructure described in Volume 5.

The model study area includes the Greater Toronto and Hamilton Area (GTHA), as illustrated in **Figure 2-1**.

[1] https://tmg.utoronto.ca/doc/1.6/gtamodel/index.html

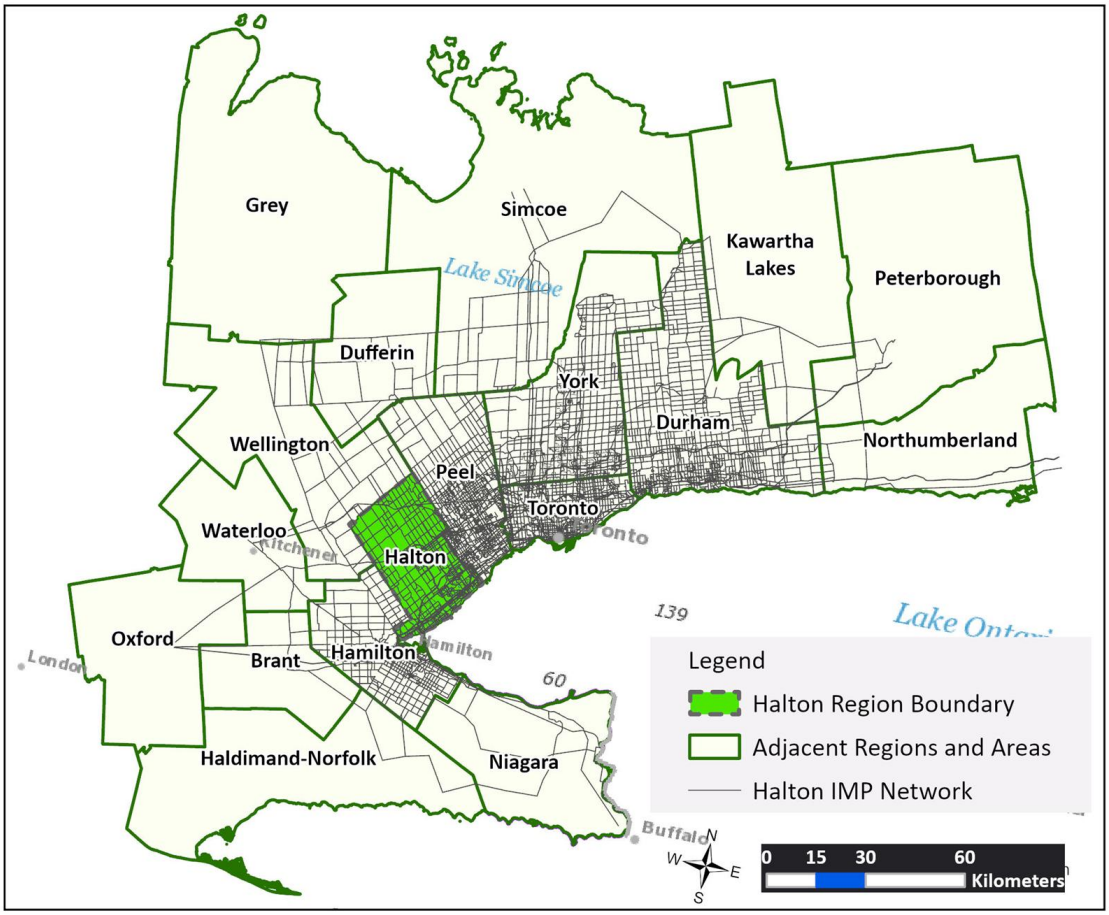


Figure 2-1 – Model Coverage Area

2.2 Model Calibration and Validation Summary

The Halton travel demand model covers the entire Greater Toronto and Hamilton Area (GTHA). A three-tiered approach was adopted for the calibration process. The first tier focused on trip movement within the Halton Region and warranted the highest degree of calibration. The second tier focused on areas where at least one trip end was within the Region, and the other end was in Hamilton, Peel, or Toronto. The third tier included all remaining areas. The following data sources were utilized for the original model calibration and validation:

- 2016 Transportation Tomorrow Survey (TTS) data
- 2016 Census Data
- Halton ATR Counts
- Cordon Count
- MTO Highway Counts
- Go Rail Station Boarding Counts
- Burlington, Oakville, Milton Transit Boarding Counts

The model reflects the updated Traffic Analysis Zones (TAZ) system, which was identified through the development of the Joint Best Planning Estimates (JBPE) (see Section 3).

In addition to the data sources listed above, the following inputs were incorporated into the model, which is illustrated in **Figure 2-2**:

- JBPE Population and Employment Information
- Updated JBPE TAZ Boundaries

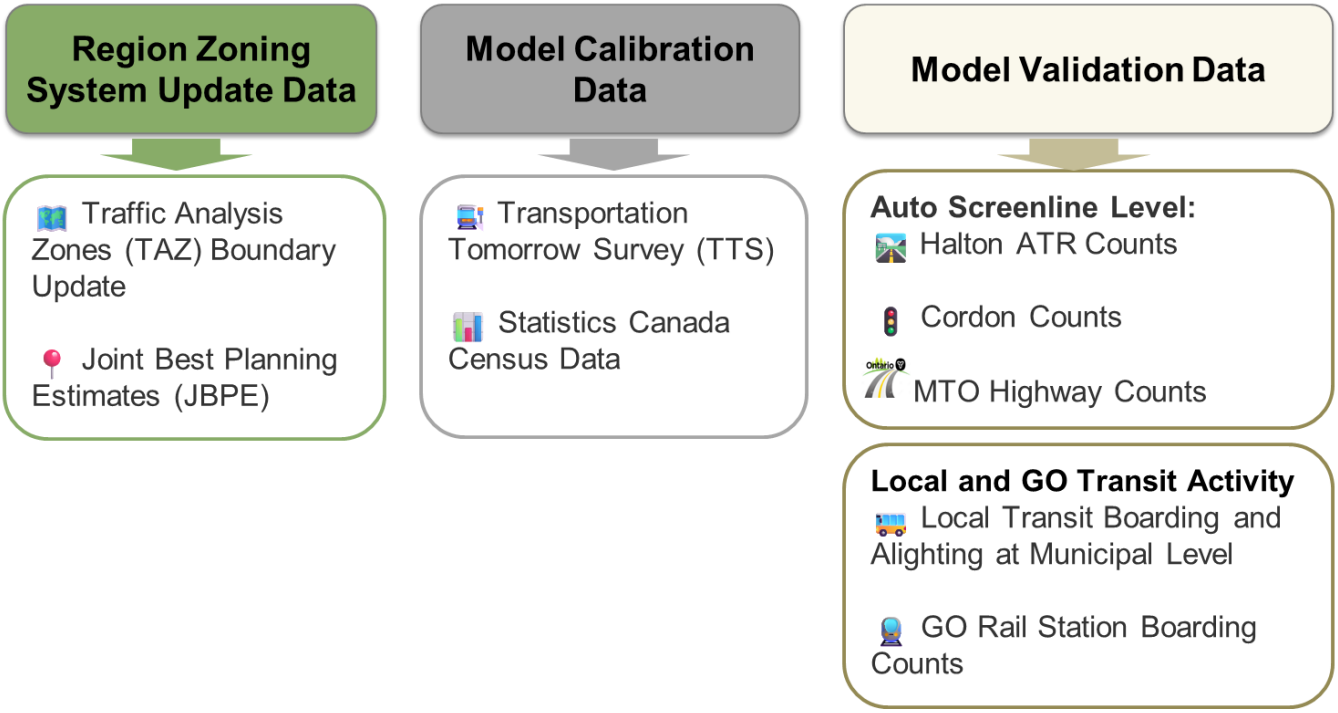


Figure 2-2 – Zonal Update and Model Validation Overview

3.0 Population and Employment Planning Forecasts

Following the completion of Halton's Integrated Growth Management Strategy (IGMS) and the Regional Official Plan Amendment 49 (ROPA 49), the Region developed the comprehensive JBPE update for population and employment in the fall of 2023 with the Local Municipalities. The JBPEs are essential input for planning and delivering Regional infrastructure, ensuring services like water, wastewater and transportation can accommodate future growth.

The 2023 JBPEs version 3.032 to the year 2051, align with the new housing targets set out in Bill 23. The updated forecasts consider new direction from the Province of Ontario as well as recently approved growth areas. As a result of the new housing targets, the JBPEs anticipate higher population growth over the next decade across all of the Halton Region's Area Municipalities than the initial IGMS and ROPA 49.

As the Region's population and employment base is forecasted to increase between 2031 and 2051, the IMP builds on the long-term servicing strategies previously outlined in the 2011 water, wastewater and transportation master plans to reflect the population and employment growth projections to 2051.

Table 3-1 highlights the residential population forecasts to the year 2051, and **Table 3-2** highlights the employment population forecasts to the year 2051, as per the JBPEs.

Table 3-1 – Residential Population Forecasts

Municipality	2051*
Burlington	324,000
Halton Hills	167,000
Milton	455,000
Oakville	443,000
Total	**1,389,000**

**The 2051 forecasts are based on the Minister's decision on ROPA 49 through Bill 162, Get It Done Act, 2024, which received Royal Assent on May 16, 2024, as well as Bill 23, More Homes Built Faster Act, which received Royal Assent on November 28, 2022.*

Table 3-2 – Employment Population Forecasts

Municipality	2051*
Burlington	150,000
Halton Hills	87,000
Milton	175,000
Oakville	212,000
Total	**624,000**

**The 2051 forecasts are based on the Minister's decision on ROPA 49 through Bill 162, Get It Done Act, 2024, which received Royal Assent on May 16, 2024, as well as Bill 23, More Homes Built Faster Act, which received Royal Assent on November 28, 2022.*

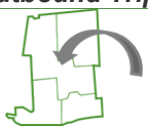
4.0 Future Travel Demand

This section provides an overview of the travel demand forecasts of the 2051 Preferred Strategy Network during the AM and PM peak periods. The travel demand growth considers traffic including auto driver, auto passenger, trucks, transit and school buses.

4.1 Travel Demand Growth

Table 4-1 provides a comparison of the travel demand for Halton Region between existing (2016) and future (2051) horizon years for AM and PM peak periods, categorized based on internal, inbound, and outbound trips. Between 2016 and 2051, Halton Region is projected to experience significant growth in travel demand across all trip types during both AM and PM peak periods, which is in-line with the population and employment growth discussed in the previous section. Internal trips exhibit the largest growth (147% in the AM and 156% in the PM), indicating that a growing share of residents both live and work within the Region. In the AM peak, inbound trips grow faster than outbound trips (141% vs. 87%), while in the PM peak, outbound trips grow slightly faster than inbound (161% vs. 135%). This directional pattern is consistent with Halton evolving into an employment destination in the morning and generating substantial outbound flows in the evening.

Table 4-1 – Halton Region's Internal, Inbound and Outbound Trips

Halton Region AM and PM Travel Demand		2016 Travel Demand	2051 Travel Demand
 *AM Peak Period*	 *Internal Trips*	147,000	363,000
	 *Outbound Trips*	90,000	168,000
	 *Inbound Trips*	71,000	171,000
 *PM Peak Period*	 *Internal Trips*	276,000	707,000
	 *Outbound Trips*	93,000	243,000
	 *Inbound Trips*	112,000	263,000

5.0 Future Network Development Methodology and Assumptions

Halton Region's long-term population and employment forecast, as discussed in Section 3, shows more than doubling of residents and jobs by 2051. The IMP built on the recommendations of previous Regional Master Plans and utilized the Joint Best Planning Estimates as a foundation to develop strategies for infrastructure requirements to accommodate future growth from 2031 to 2051.

The identification and evaluation of the network strategy alternatives was a crucial element of the master planning process. The development of strategies allowed for a comprehensive review of potential solutions, supporting informed decision-making and ensuring the recommended strategies were both well-founded and defensible. The travel demand model served as a critical forecasting and analytical tool to identify and evaluate various network strategy alternatives to allow for a comprehensive, data-driven, and transparent review of potential network solutions.

To guide the development of a future-ready and a flexible transportation system, an iterative, structured, and scenario-based approach was undertaken to assess the transportation network. As illustrated in **Figure 5-1**, the assessment followed a three-stage framework.

Prior to the long-list scenario testing and network alternative development, a future base network was developed, and the future land-use projection for Halton Region and the neighbouring municipalities was updated in the travel demand model. The future base network served as the common reference condition that can be used for scenario evaluation while accounting for the planned/approved future infrastructure improvements. The future base network adjustments extended beyond Halton's boundaries because part of the Region's trips, particularly along major highways, GO corridors, and key arterials, are influenced by conditions, infrastructure, and growth patterns in the broader GTHA. The base network assumptions and considerations are discussed in the next sub-section.

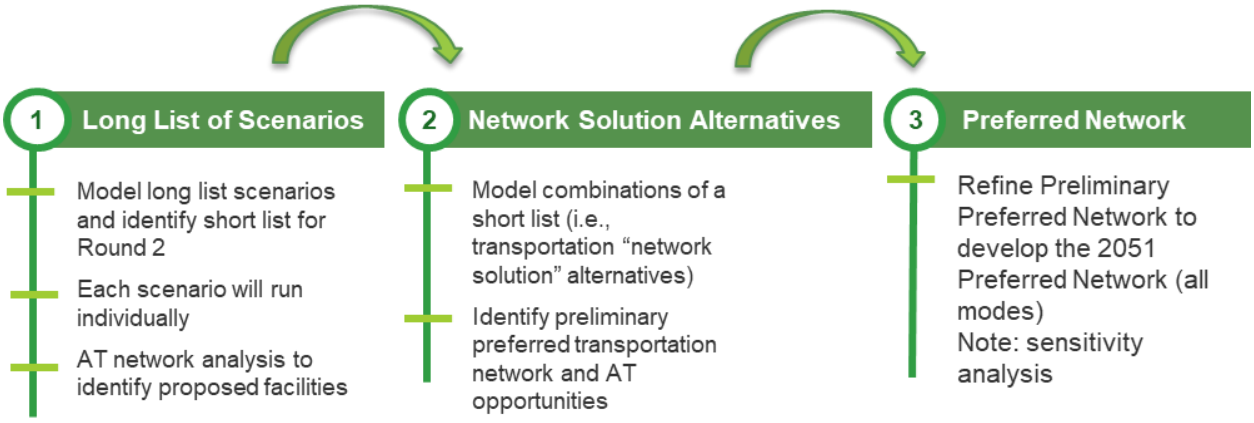


Figure 5-1– Regional Road Network Development Approach

5.1 Future Base Network Assumptions and Considerations

The Transportation component of the IMP lays out a strategy for the Region's future transportation network to the year 2051. The IMP builds on the previous Halton Region Transportation Master Plan (2011), and Active Transportation Master Plan (2015) and utilized the Joint Best Planning Estimates (JBPE) as a foundation to develop strategies for infrastructure requirements to accommodate future growth from 2031 to 2051. Inputs into the IMP included background studies and plans by the Region, Local municipalities, as well as adjacent municipalities and other agencies such as the Ministry of Transportation and Metrolinx. An overview of these plans and studies is provided below.

5.1.1 Provincial

Provincial Planning Statement (2024)

As discussed in Volume 2, the 2024 *Provincial Planning Statement* (PPS) provides policy direction on matters of provincial interest related to land use planning and development. Replacing both the 2020 PPS and *A Place to Grow*, the 2024 PPS establishes a unified framework while maintaining certain *Growth Plan* policies that were referenced in the *Greenbelt Plan*. Municipalities now have greater flexibility to plan for growth based on local conditions, including setting growth targets and delineating Major Transit Station Areas (MTSAs). Corridors for infrastructure and transportation must be protected for current and future needs, with development adjacent to these corridors designed to minimize adverse impacts. The Ontario Government's *Planning Act, 1990*, requires that all planning decisions in the province be consistent with the PPS.

Section 3.2 and 3.3 in the PPS highlights the relevant transportation planning policies, including:

- Transportation systems should be safe, energy efficient, and multimodal, supporting zero- and low-emission vehicles and improved connectivity.
- Existing infrastructure should be used efficiently, incorporating demand management strategies where feasible.
- Corridors for infrastructure and transportation must be protected for current and future needs, with development adjacent to these corridors designed to minimize adverse impacts.
- Co-location of linear infrastructure is encouraged where appropriate, along with preserving abandoned corridors for compatible uses.

The 2024 PPS emphasizes greater local responsibility in planning while supporting infrastructure investments that align with housing and economic growth goals. Its policies promote sustainable, integrated water, wastewater, and transportation systems that protect environmental and community health.

Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe (2022)

The Ontario Ministry of Transportation's Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe, was created to provide a 30-year vision for enhanced mobility across and beyond the Greater Golden Horseshoe Region (refer to **Figure 5-2** and **Figure 5-3**). The Plan lays out a framework for a transportation system that provides safe, efficient, and convenient options for people and businesses and supports the well-being and economic prosperity of the region into the future. The Plan's

vision for 2051 includes infrastructure, service improvements and policies organized under the four inter-related themes of: fighting gridlock and improving road performance; getting people moving on a connected transit system; supporting a more sustainable and resilient region; and efficiently moving goods. Examples of key transportation improvements include but are not limited to the development of Highway 413 from Highway 400, between King Road and Kirby Road to the 401/407 ETR interchange near Mississauga, Milton and Halton Hills and the 407 Transitway (an east-west bus rapid transit corridor parallel to Highway 407). Other improvements include widening of various segments of Highway 401, Highway 403, and QEW throughout Halton Region.

Figure 5-2 – Map 4 from MTO Connecting the GGH (2022) showing current, planned and conceptual future road infrastructure

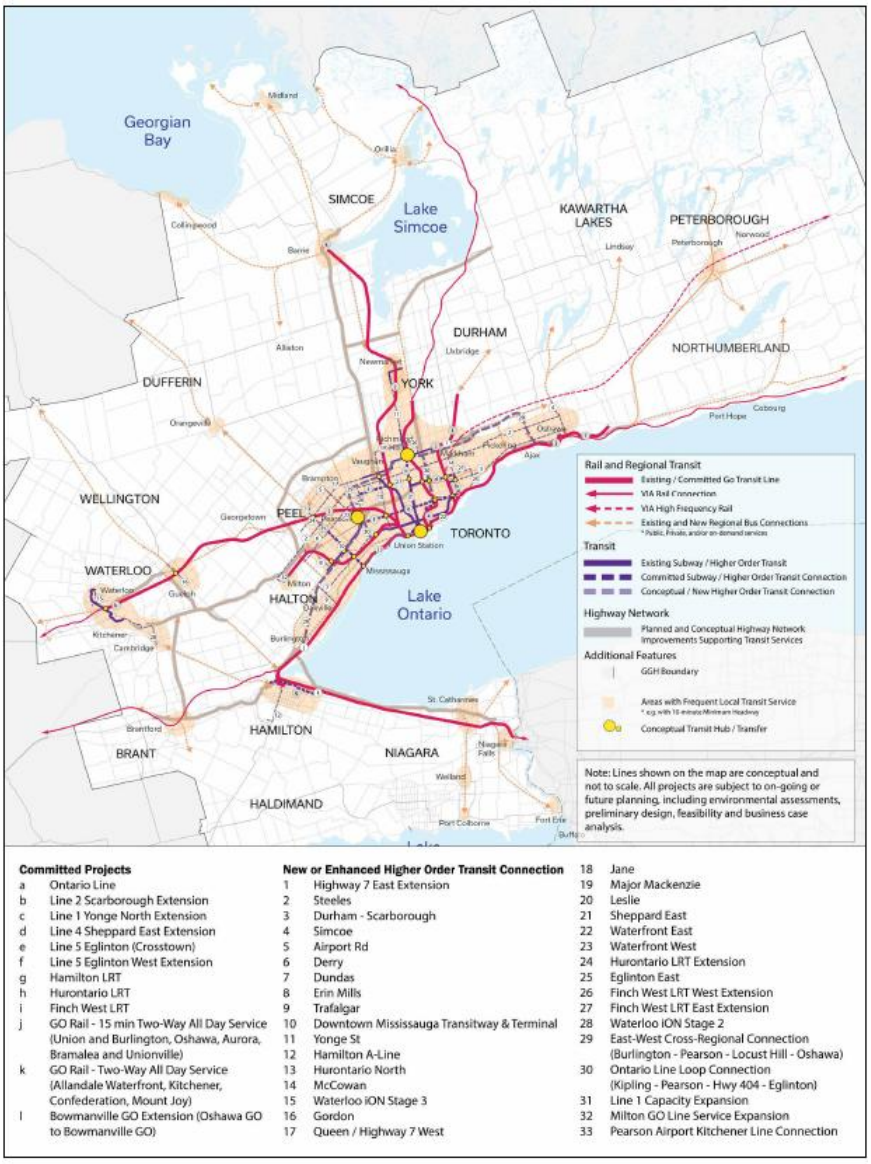


Figure 5-3 – Map 5 from MTO Connecting the GGH (2022) showing current, planned and conceptual future transit infrastructure and services

The Metrolinx 2041 Regional Transportation Plan (2018)

In March 2018, Metrolinx released the 2041 Regional Transportation Plan (RTP) for the Greater Toronto and Hamilton Area (GTHA). The vision of the 2041 RTP is for "a sustainable transportation system that is aligned with land use and supports healthy and complete communities." Metrolinx is currently undertaking an update to extend the plan to 2051.

The Plan largely focuses on the development of a Frequent Rapid Transit Network throughout GTHA. This network consists of expanded 15-minute GO Rail service, Bus Rapid Transit (BRT), Light Rail Transit (LRT), and subway projects, as well as a series of Priority Bus Corridors (refer to **Figure 5-4**). The Frequent Rapid Transit Network will play an important role in the Region's transportation future by connecting more people with fast, efficient public transit. Frequent Rapid Transit Network projects within Halton Region include, for example:

- Milton GO Rail Line and Lakeshore West Line – 15-minute Two-Way All-Day
- Priority Bus along Harvester Road/Speers Road/Cornwall Road, Derry Road, Regional Road 25, Trafalgar Road, Brant Street, Dundas Street West
- Dundas Street BRT
- Trafalgar Road BRT/LRT
- Frequent Regional Express Bus along Highway 401, Highway 403, and Highway 407

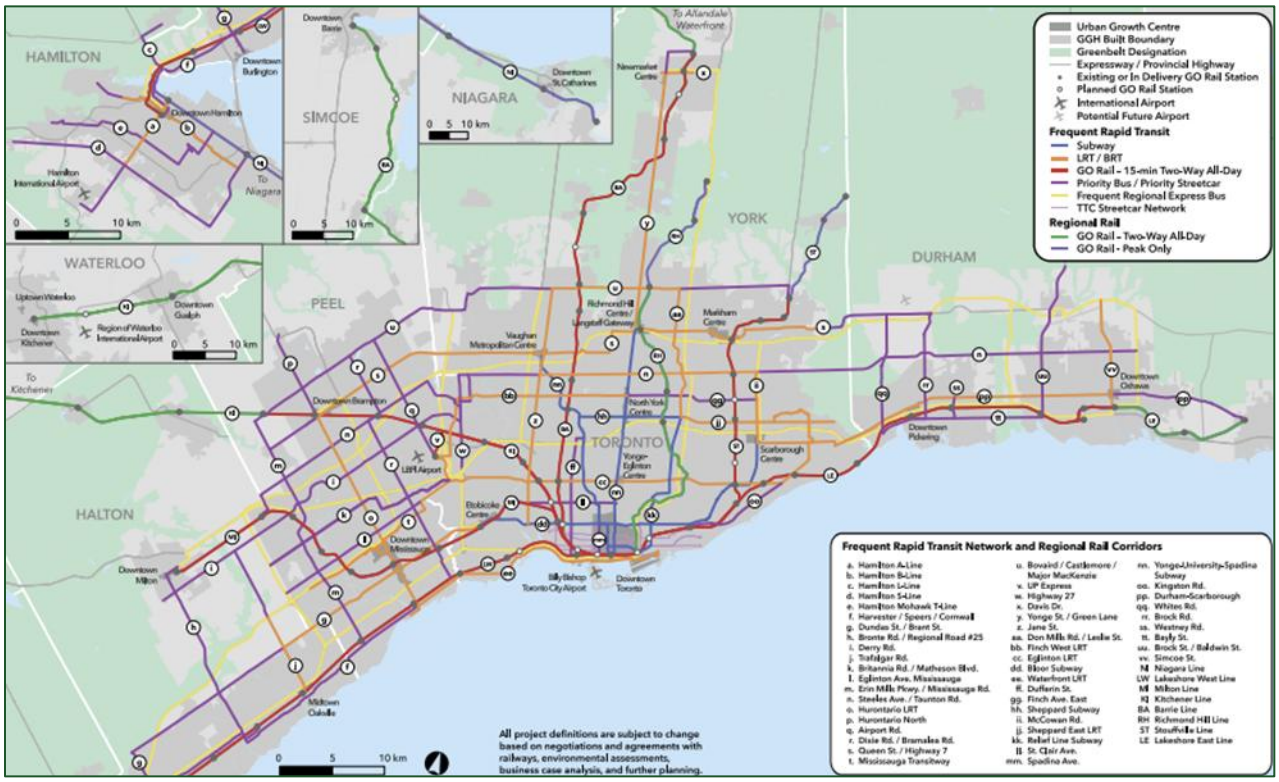


Figure 5-4 – Map 6 from Metrolinx 2041 Regional Transportation Plan (2018), 2041 Frequent Rapid Transit Network

5.1.2 Regional Plans

As of July 1, 2024, the Halton Region Official Plan is no longer an official plan for the Regional Municipality of Halton as the Planning Act identifies the Region as an “upper-tier municipality without planning responsibilities”. Instead, it is now deemed an official plan of each of the Local Municipalities in Halton (e.g., Town of Halton Hills) until such time as it is revoked or amended by the respective municipality.

The 2022 Regional Official Plan (ROP) is a land use policy document that guides how Halton Region grows and develops. It includes goals and objectives for new development that reflect the vision of residents and Regional council. The ROP addresses region-wide issues and provides a consistent vision for land use in the Local Municipalities of Burlington, Halton Hills, Milton, and Oakville. Each local municipality has an official plan of their own, which will work alongside the adopted ROP until they undertake a review of their official plan.

The ROP sets out Regional structure consisting of systems, land use designations, and constraints to development. The ROP also focuses on four key thematic areas, these include: planning vision, healthy communities, land stewardship, and implementation. As noted above, the ROP, in conjunction with Official Plan of the Local Municipalities, continues to provide direction and high-level guidance for the Region's growth and development.

Transportation Master Plan to 2031 – The Road to Change (2011)

Halton Region's 2011 Transportation Master Plan, *The Road to Change*, was designed to guide the development of a Regional transportation system that supports the objectives of a sustainable Halton and meet the Region's transportation needs safely, effectively and cost efficiently to 2031. The Plan put forward a vision for transportation planning that accommodates various travel choices and supports a sustainable and multi-modal network.

As the Region continues to grow beyond 2031, the types of mobility options and how people move within and beyond the Region will continue to evolve. It is critical to continue to plan for a multi-modal transportation network that prioritizes infrastructure for transit and active transportation. The IMP builds on the recommendations of the 2011 Transportation Master Plan to guide Region's transportation vision into the future to 2051 and beyond.

The Region continues to implement improvements from the TMP to 2031, including the following ongoing MCEA studies:

- New North Regional Road Corridor (formerly 5 ½ Line)
- North Halton Coordinated Municipal Class Environmental Assessment Study
    - James Snow Parkway (Britannia Road to Highway 401), 4 to 6 lanes
    - Steeles Avenue (Reginal Road 25 to Trafalgar Road), 4 to 6 lanes
    - Regional Road 25 from 5 Side Road to 10 Side Road, localized improvements
- Norval West Bypass Transportation Corridor Improvements, new 4 lane corridor from Highway 7 to 10 Side Road
- Regional Road 25 Corridor Study (Speers Road to Derry Road), 4 to 6 lanes
- Trafalgar Road Corridor Study (Highway 407 ETR to Steeles Avenue), 4 to 6 lanes
- James Snow Parkway Extension Addendum (Highway 407 ETR to Britannia Road), new 6 lanes corridor

Active Transportation Master Plan (2015)

The Halton Active Transportation Master Plan (ATMP) supports the transportation network set out in the 2011 Halton Transportation Master Plan, which includes addressing cycling and walking along Regional roads to fulfill the transportation needs in Halton Region. The ATMP identifies active transportation infrastructure to 2031, with a vision of providing walking and cycling facilities on all Regional roads in urban areas, and paved shoulders on all Regional roads in rural areas. As part of this vision, active transportation infrastructure will be planned, designed, and incorporated within roadway resurfacing and capital projects. The IMP updates the recommendations from the 2015 ATMP in consideration of updated guidelines and best practices, including facility type and intersections.

Mobility Management Strategy (2017)

Halton Region has developed a Mobility Management Strategy based on the principle of 'Mobility-as-a-Service.' This principle recognizes that mobility options are no longer clearly divided between roadway and transit options. In addition, transit options are no longer defined by fixed-route, fixed guideway, or demand-responsive transit-services, but rather, are offered as a menu of travel options provided by both the public and private sector and supported by technology. This Strategy guides the evolution of a region-wide inter- and intra-transportation network to 2041.

The development of a region-wide Transit Priority Mobility Network is one of the key recommendations of the Mobility Management Strategy study. A network of east/west and north/south Transit Priority Corridors were identified.

Defining Major Transport Requirements in Halton Region (2019)

The Defining Major Transit Requirements (DMTR) study is a continuation and fulfillment of the next steps established through the Mobility Management Strategy in support of the vision for a multi-modal transportation network. The focus of the DMTR is on Regional Infrastructure investment to support transit.

As part of the DMTR Study, Preliminary 2031 and 2041 Recommended Transit Priority Corridor Networks – Infrastructure, were identified which served as a key input into the IMP. These Transit Priority Corridors include Bus in Mixed Traffic Corridors, Priority Bus Corridors and Bus Rapid Transit Corridors.

5.1.3 Local Municipal Plans

In addition to Regional plans, the Local Municipalities also have developed plans to guide future travel demand. Some key plans considered as part of the IMP include for example the following:

Burlington

- Integrated Mobility Plan (2023)
- Cycling Plan Update (2020)
- Rural Active Transportation Plan (2022)

Halton Hills

- Transportation Master Plan (2011)
- Active Transportation Plan (2019)
- Transit Service Strategy (2019)
- Mobility Master Plan (ongoing)

Milton

- Transportation Master Plan (2024)
- Transit Master Plan Update (2024)
- Milton Transit Services Review and Master Plan (2019)

Oakville

- Switching Gears- Transportation Master Plan (2018)
- Active Transportation Master Plan (2017)
- Transportation Master Plan Update (2025)
- Midtown Transportation Master Plan (ongoing)

5.1.4 Adjacent Municipal Plans

Adjacent Municipalities have developed plans to guide future travel demand. Some key plans considered as part of the IMP include the following:

City of Hamilton

- Transportation Master Plan, City in Motion (2018)
- Hamilton's Cycling Master Plan (2009)
- Accelerated Active Transportation Implementation Plan (2024)
- Recreational Trails Master Plan (2016)

Wellington County

- Active Transportation Plan (2022)

Region of Peel

- Let's Move Peel- Long Range Transportation Plan (2019)
- Sustainable Transportation Strategy (2018)
- Goods Movement Plan (2019)

5.2 Round 1: Long List of Scenarios

To address travel demand to 2051, the first stage of the IMP network development focused on testing a structured set of transit infrastructure-oriented and road-oriented long-list scenarios to the 2051 planning horizon, which drew on recommendations from the 2011 TMP and the 2019 Defining Major Transit Requirements (DMTR) study, and included input from Local, Regional, and Provincial plans. The travel demand model was updated to reflect the Local municipal network and MTO network updates, as per the plans identified in Sections 5.1.1 and 5.1.3. The outputs from the scenario testing informed whether to retain, modify, or not carry forward individual improvements for the Round 2 network for further evaluation. The following sub-sections provide an overview of the long list scenarios that were evaluated for the development of the network alternative solutions.

5.2.1 Transit-Infrastructure Improvement Scenarios

The long list of scenarios to address travel demand to 2051 is shown below and the details regarding the transit-infrastructure improvement scenarios are provided in **Table 5-1**.

1. 2051 Base Scenario (i.e. including 2031 Regional Capital Program, 2041 Transit Priority Corridor Network per 2019 DMTR and Metrolinx improvements per 2041 RTP)
2. Speed Sensitivity of Queue Jump/Transit Signal Priority (TSP)
3. Upgrade Priority Bus Corridors (Mixed Traffic with Queue Jump + TSP)
4. Upgrade to additional Priority Bus Corridor to High Occupancy Vehicle (HOV) + TSP
5. Upgrade to Priority Bus Corridors from HOV+TSP to Bus Rapid Transit (BRT) Corridors

Overall findings for the long list of scenarios indicate:

- A reduction in Vehicle Kilometres Travelled (VKT) under all scenarios.
- Addition of BRT corridors (Scenario 5) resulted in the most significant reduction in VKT due to more dedicated transit corridors.
- Addition of BRT Corridors resulted in the reduction in auto users and increase in transit users at all corridors.
- Most significant impact is observed on Regional Road 25, connecting Bronte GO to Milton GO. Regional Road 25 is a key corridor that is centrally located, hence attracting more transit users.
- A combination of additional "HOV/TSP" corridor segments and BRT corridors are to be included in the Network Alternatives (i.e. Round 2 Modelling).

5.2.2 Need for Road Widening/Extension

Through the long list scenario assessment, the need for road widening/extension of the following corridors, which were previously identified as part of Halton Region 2011 TMP, were re-evaluated in further details. The following road widening/extensions from the Halton Region 2011 TMP were not carried forward as part of the preferred transportation network development:

- North Service Road (Between Burloak Drive and Regional Road 25): Since the completion of the Halton Region 2011 TMP, the Wyecroft Road extension has proceeded to construction to support east-west travel. As part of the Long List Scenarios, it was found that the addition of a 4-lane North Service Road extension between Burloak Drive and Regional Road 25 would not be likely to attract significant traffic volumes. Therefore, the North Service Road extension between Burloak Drive and Regional Road 25 was not carried forward.

- Upper Middle Road (between Regional Road 25 and Ninth Line to remain as a 4-lane road): Based on the analysis, there are opportunities to consider localized improvements along Upper Middle Road to address future travel demand. Widening Upper Middle Road to 6 lanes from Regional Road 25 to Ninth Line was not carried forward.

Through the previous Transportation Master Plan to 2031, most Regional roads, including new corridors are planned to be six lanes. As such, there are limited additional road widening opportunities to support growth in population and employment to 2051.

As part of long-list scenarios, the potential role of additional roadway capacity through widenings on selected Regional corridors in long-term transportation planning was evaluated. The scenario testing provided qualitative insights into how additional capacity could influence overall network performance under future demand conditions, which indicated that the following road widenings should be carried forward as part of the Preferred 2051 Transportation Network:

- **Neyagawa Boulevard:** The widening of Neyagawa Boulevard between William Halton Parkway and Dundas Street resulted in improved traffic flow conditions, reflecting the ability of additional roadway capacity to relieve congestion and support more efficient movement along the corridor.

- **Trafalgar Road:** The widening of Trafalgar Road between Steeles Avenue and 10 Side Road results in higher volumes being attracted to the corridor reflecting changes in travel patterns and route choice in response to increased roadway capacity. The analysis indicated that these changes were accompanied by improved overall network performance along the corridor.

- **Ninth Line:** The widening of Ninth Line between Steeles Avenue and 10 Side Road results in higher volumes being attracted to the corridor reflecting changes in travel patterns and route choice associated with increased roadway capacity. The analysis indicated that overall network performance along the corridor improved despite these shifts in traffic distribution.

The details regarding the need for road widening/extension scenarios are provided in **Table 5-1**.

5.2.3 Localized Corridor Improvements

Based on increasing travel demand by 2051, there are segments of corridors where future travel demand may be addressed through localized improvements, instead of full widenings. Localized improvements may include, for example, signal optimization, signage improvements, additional auxiliary lanes and local lane widening. The following segments of the corridors were identified as potential candidates for localized improvements to address future travel demand:

- Regional Road 25 from 5 Side Road to north of 25 Side Road in Halton Hills
- 10 Side Road between Trafalgar Road and Winston Churchill Boulevard in Halton Hills
- Guelph Line between Campbellville Road and Highway 401 in Milton
- William Halton Parkway between Regional Road 25 and Ninth Line / Ford Drive in Oakville
- Upper Middle Road between Regional Road 25 and Ninth Line in Oakville
- Ford Drive between Upper Middle Road and Highway 403 in Oakville

The localized corridor improvements are identified in **Figure 5-7** and the implementation timeline will be confirmed through the monitoring of travel demand and intersection operations. The exact type of improvement to be implemented will be based on future monitoring and study findings.

Table 5-1 – Long-list Scenarios

Scenario	Rationale	Tested Items / Corridors	Outcome	Status
1. 2051 Base Scenario	This scenario was developed based on 2031 Regional Capital Program, 2041 Transit Priority Corridor Network per 2019 DMTR and Metrolinx improvements per 2041 RTP. The scenario served as the "baseline" when comparing conditions of the transportation network with potential improvements	All Halton Region Transportation Network	The road and transit network of this scenario was included in all tested scenarios	Carried forward
2. Speed Sensitivity of Queue Jump/Transit Signal Priority (TSP)	Transit Travel Speed attribute has increased by 4 km/hr to better understand TSP and queue jump effects on the network performance as identified in DMTR 2019	All Transit Priority Corridors outlined in DMTR 2019	Transit travel speed was increased by 4 km/h on Transit Priority Corridors in all tested scenarios	Carried forward
3. Additional Queue Jump/Transit Signal Priority (TSP)	Additional corridors with TSP and Queue Jump from 2041 network (DMTR 2019) to support connections between municipalities, MTSAs (Major Transit Station Area), and major destinations	Scenario 2 plus the following: Guelph Line – Harvester Road to Dundas Street Regional Road 25 – Milton GO to Acton GO (urban area only) James Snow Parkway – Upper Middle Road to Britannia Road Derry Road – Regional Road 25 to Tremaine Road Britannia Road – Regional Road 25 to Tremaine Road	The following were included in the preferred network as TSP + QJ corridors: Guelph Line – Harvester Road to Dundas Street Regional Road 25 – Highway 401 to 5 Side Road James Snow Parkway – Upper Middle Road to Dundas Street	Partially carried forward
4. Upgrade to additional Priority Bus Corridor to High Occupancy Vehicle (HOV) + TSP	Corridor segments identified as "Mixed Traffic Corridor / TSP" in 2041 Transit Network (DMTR 2019) upgraded to "HOV / TSP" to test the impact of additional dedicated transit infrastructure that connects to MTSAs and other major destinations	Brant Street – Burlington GO to Dundas Street Appleby Line – Appleby GO to Hwy 407 Carpool Lot Dundas Street – Regional Road 25 to Brant Street Trafalgar Road – Steeles Avenue to Georgetown GO Derry Road – Regional Road 25 to Tremaine Road Britannia Road – Regional Road 25 to Tremaine Road Plains Road / Harvester Road (throughout Burlington)	The following were included in the preferred network as HOV +TSP: Brant Street – Burlington GO to Dundas Street Appleby Line – Appleby GO to Highway 407 Carpool Lot Britannia Road – Regional Road 25 to Tremaine Road	Partially carried forward
5. Upgrade to Priority Bus Corridors from HOV+TSP to Bus Rapid Transit (BRT) Corridors	Corridor segments identified as "HOV / TSP" upgraded to "BRT / TSP" to test the impact of additional dedicated bus-only infrastructure	Trafalgar Road – Highway 407 to Steeles Avenue Steeles Avenue – Regional Road 25 to Halton East Limit Britannia Road – Tremaine Road to Hwy 407 Appleby Line – Appleby GO to Dundas Street Regional Road 25 – Bronte GO to Milton GO Derry Road – Tremaine Road to Highway 407	The following were included in the preferred network as BRT +TSP: Trafalgar Road – Highway 407 to Future Trafalgar GO Transit Station Regional Road 25 – Bronte GO to Milton GO Derry Road – Tremaine Road to Highway 407	Partially carried forward
6. Without North Service Road Extension	This scenario evaluates the impact of *not implementing* the North Service Road extension identified in the 2011 TMP on east-west travel behavior. This scenario was tested since the Wyecroft Road extension is already proceeded to support east-west connectivity across the environmentally sensitive area at the Oakville/ Burlington boundary	North Service Road – Burloak Drive and Bronte Road	The addition of a 4-lane North Service Road extension between Burloak Drive and Regional Road 25 would not be well utilized. Therefore, the North Service Road extension between Burloak Drive and Regional Road was not carried forward in Round 2 of the analysis.	Carried forward
7. Without Widening on Upper Middle Road in Oakville	This scenario evaluated the travel impact of 4-lane (2 GP lanes per direction) Upper Middle Road configuration (existing condition) versus 6-lane (3 GP lanes per direction) Upper Middle Road configuration (per 2011 TMP recommendations). MCEA Study was deferred because of communities' concerns.	Upper Middle Road – Bronte Road/Regional Road 25 to Ninth Line	Findings from the analysis indicated that Upper Middle Road may exceed road capacity as a 4-lane road. However, there are opportunities to consider for localized improvements to address future transportation needs. Hence, in Round 2 of the analysis, Upper Middle Road between Bronte Road/Regional Road 25 and Ninth Line to be at 4 lanes and opportunities for localized improvements were explored.	Carried forward
8. Need for potential Regional Road(s) Widening	Additional north-south capacity is required to support the traffic growth occurring in Milton and Halton Hills by 2051.	Trafalgar Road (Steeles Avenue to 10 Side Road): widening from four to six lanes Ninth Line (Steeles Avenue to 10 Side Road): widening from four to six lanes Neyagawa Boulevard (Dundas Street to William Halton Parkway): widening from four to six lanes	The V/C analysis indicated that these corridors required additional auto capacity to address the anticipated demand.	Carried forward

5.3 Round 2: Network Alternative Solutions

In the second round of the modelling process, elements from the long list scenario evaluation were combined into integrated network alternative solutions. These alternatives tested how transit and roadway strategies can be implemented together to improve the overall network mobility and performance across the Halton Region.

Based on the analysis of the long-list scenarios, three alternative network solutions were developed for further analysis. The three (3) network alternatives were developed in consideration of the following:

- Most Regional Road will be widened to six-lane by 2031 within the urban area; therefore, prioritizing transit-related infrastructure provides the greatest potential for moving people across the Region.
- Transit-infrastructure improvements as recommended in the 2019 Defining Major Transit Requirements (DMTR) Study are the basis for the Transit Priority Corridor network including cross boundary connections.
- Local municipal plans such as Transportation and Transit Master Plans and network improvements in Local and adjoining municipalities will be considered.
- Future MTO and Metrolinx network improvements will be considered.

Furthermore, as discussed in previous sub-section, the long list scenario assessment identified new road widenings to address future travel demand, including:

- Trafalgar Road (Steeles Avenue to 10 Side Road): widening from four to six lanes;
- Ninth Line (Steeles Avenue to 10 Side Road): widening from four to six lanes; and
- Neyagawa Boulevard (Dundas Street to William Halton Parkway): widening from four to six lanes.

Table 5-2 summarizes the three alternative network solutions, which are (1) 2051 Base Case Network, (2) 2051 Core Transit, and (3) 2051 Enhanced Transit.

Table 5-2 – Regional Road and Transit Priority Corridor Infrastructure Network Alternatives

Network Alternative	Description and Opportunities
2051 Base Case Network	• Includes all road and transit network outlined in Sections 5.1 and 5.2
2051 Core Transit	• Incorporates all improvements from the 2051 Base Network • 2041 Transit Priority Corridor Network per 2019 DMTR with enhancements to Higher Order Transit Spines (for example, Dundas Street/Trafalgar Road/Regional Road 25/Derry Road)
2051 Enhanced Transit	• Incorporates all improvements from the 2051 Base and Core Networks • 2041 Transit Priority Corridor Network per 2019 DMTR with additional Higher Order Transit Spines, for example Steeles Avenue and Britannia Road and additional transit improvements on various corridors

5.4 Round 3: Preferred Transportation Network Development

The three Alternative Solutions were evaluated using comprehensive multimodal performance metrics (See Section 6.0). Overall, all three solutions include elements that are carried forward in the development of the Preferred 2051 Transportation Network Strategy (i.e., the Preferred Alternative Solution).

By drawing on the highest-performing elements of each Alternative Solution, the 2051 Preferred Transportation Strategy Network was developed to prioritize transit-supportive infrastructure to meet 2051 travel demand and providing long-term flexibility to accommodate Local growth priorities.

Transit Priority Corridor infrastructure improvements that demonstrated measurable increases in supporting travel demand, particularly along strategic growth corridors, were incorporated. In parallel, roadway widenings were included to ensure the network continues to accommodate travel demand, including goods movement. and future growth. **Figure 5-5, Figure 5-6, and Figure 5-7** provides the 2051 Preferred Strategy Network – Lane Configuration, 2051 Preferred Strategy Network – Transit Priority Corridor Infrastructure Network, and Future Localized Improvements along Halton Regional Road Corridors.

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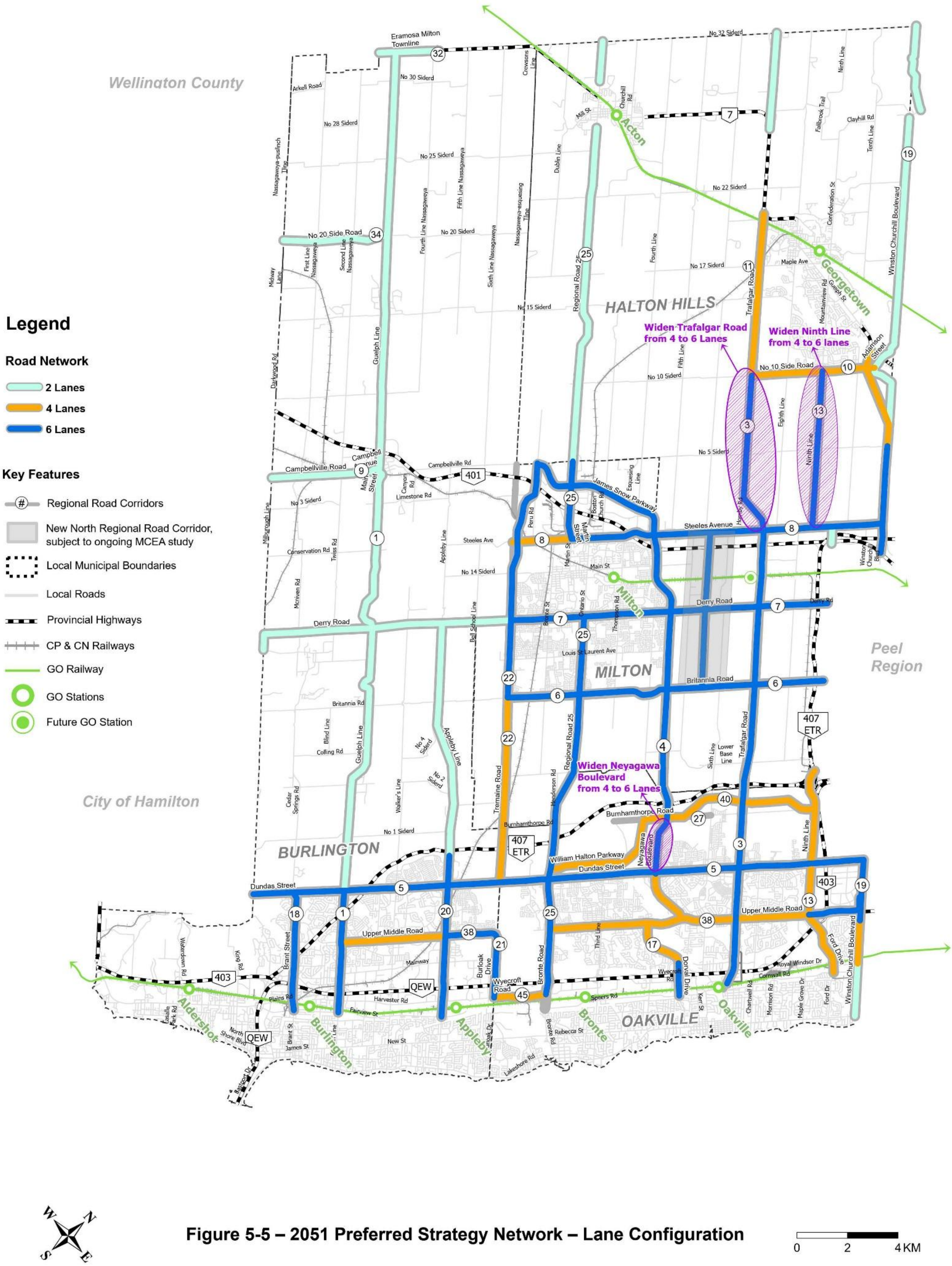

Figure 5-5 – 2051 Preferred Strategy Network – Lane Configuration

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Figure 5-6 – 2051 Preferred Transit Priority Corridor Infrastructure Network

0 2 4 KM

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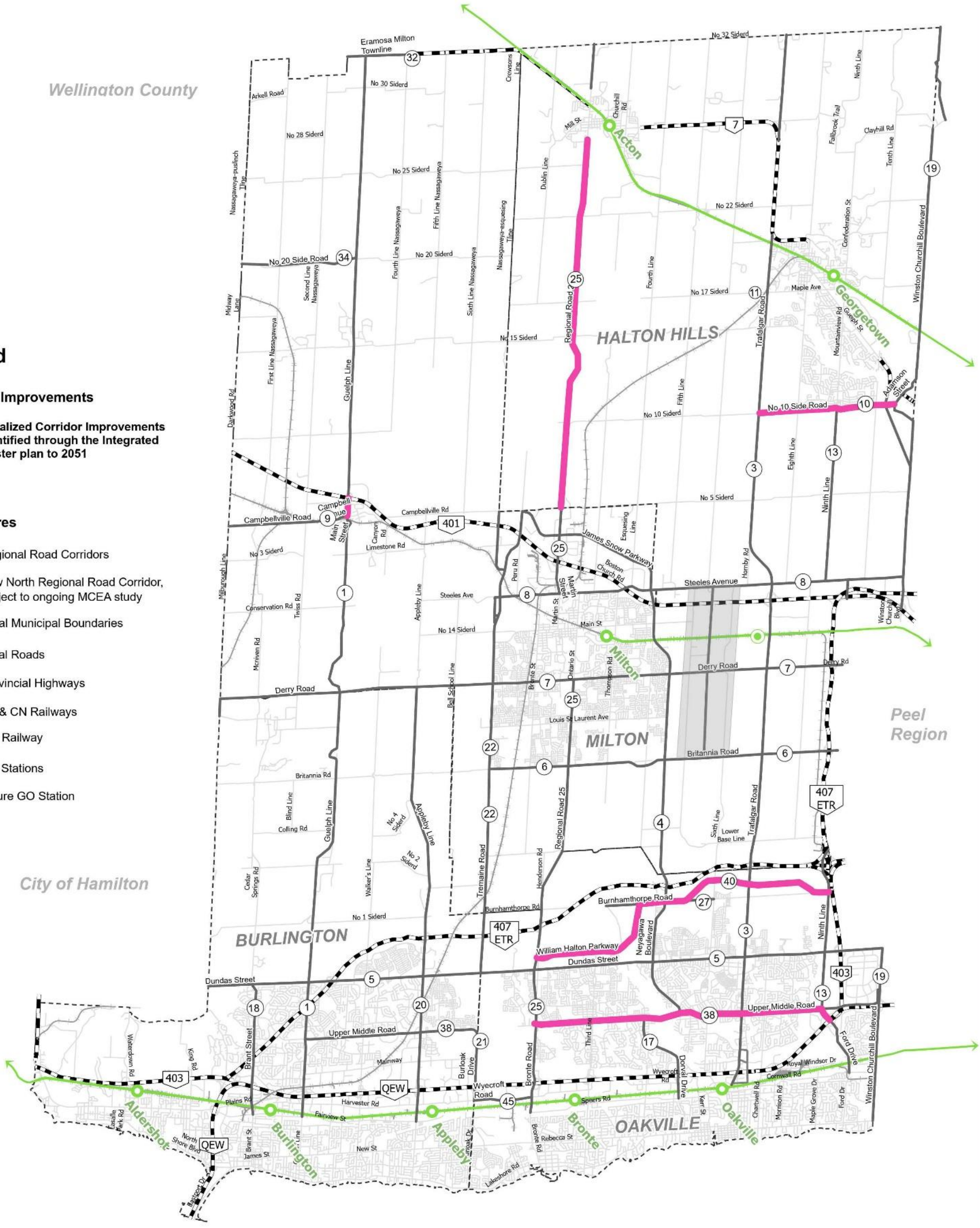

Figure 5-7 – Future Localized Improvements Along Halton Regional Road Corridors

6.0 Network Alternative and Preferred Solutions Evaluation

Three network alternative solutions were developed: (1) 2051 Base Case Network, (2) 2051 Core Transit, and (3) 2051 Enhanced Transit. The Transit Priority Corridor Infrastructure Network developed for the three alternative solutions are shown in **Figure 6-1**, **Figure 6-2**, and **Figure 6-3** respectively.

The 2051 Preferred Transit Priority Corridor Network was developed based on the highest-performing elements of each alternative network solutions and is shown in **Figure 5-6**.

The Transit Priority Corridor infrastructure improvements can evolve over time based on need and local priorities. The implementation of infrastructure will be driven by travel demand, transit ridership and connectivity. There is flexibility in the phasing of the Transit Priority Corridor network to allow priority treatments to be upgraded as ridership increases, ensuring that enhancements reflect where demand is highest. It is recognized that the timing and transition of the Transit Priority Corridors will require close coordination between the Region and the Local Municipalities.

The Network Alternatives and the Preferred Transit Priority Corridor Network were evaluated using network-wide multimodal performance metrics. The assessment considered the overall transit and auto operations, network capacity, and overall efficiency of movement along regional road corridors.

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Transit Priority Regional Road Corridors

Form		Type
Mixed Traffic + QJ + TSP	Priority Bus Corridors	
HOV + TSP		
BRT + TSP	BRT Corridors	

Key Features

- Other Existing Regional Road Corridors
- Other Proposed Regional Road Corridors
- New North Regional Road Corridor, subject to ongoing MCEA study
- Local Municipal Boundaries
- Local Roads
- Provincial Highways
- CP & CN Railways
- GO Railway
- GO Stations
- Future GO Station

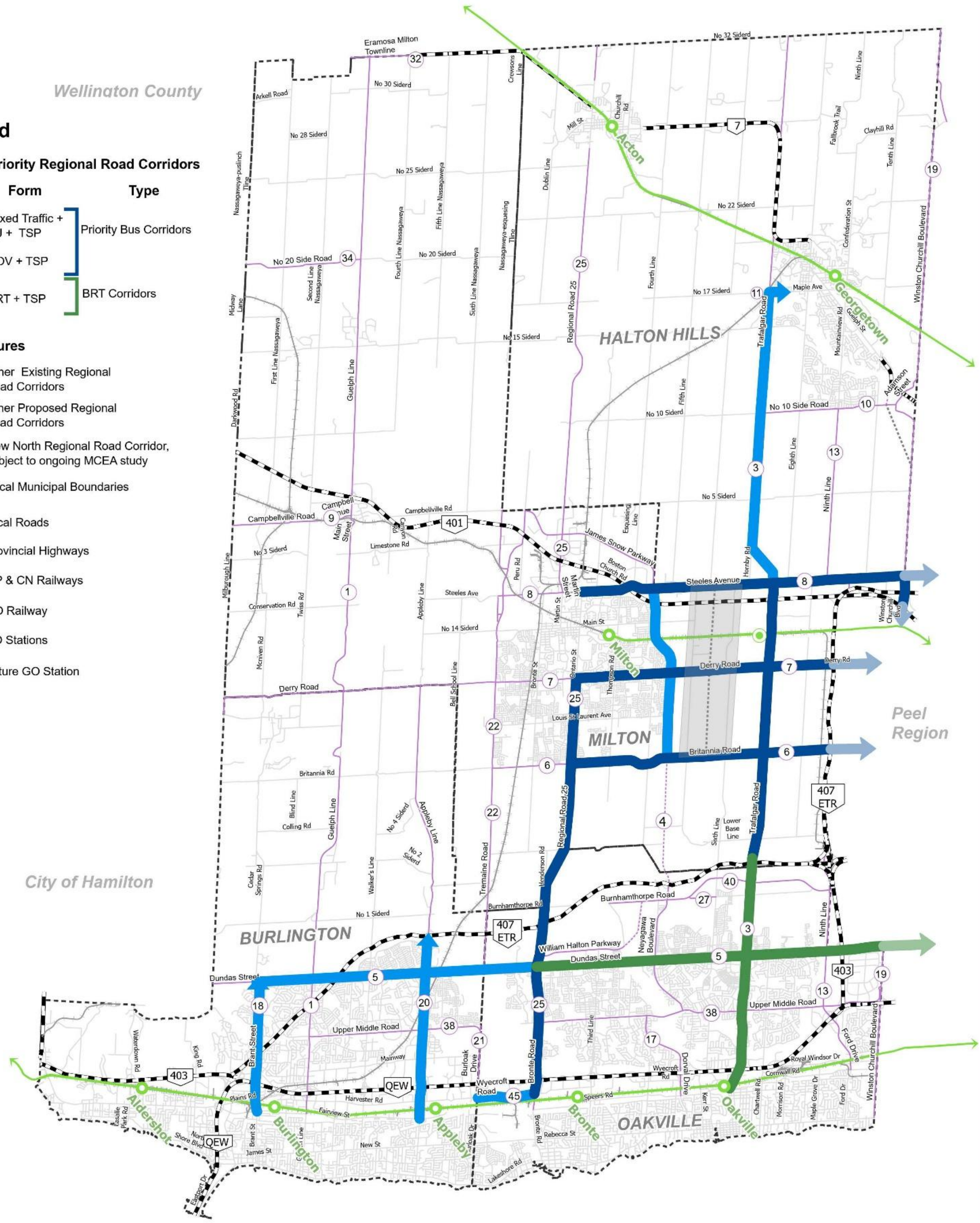

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Figure 6-1 – 2051 Base Case Alternative Solution — Transit Priority Corridor Infrastructure Network in Round 2

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Figure 6-2 – 2051 Core Transit Alternative Solution — Transit Priority Corridor Infrastructure Network in Round 2

0 2 4 KM

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Transit Priority Regional Road Corridors

Form	Type
Mixed Traffic + QJ + TSP	Priority Bus Corridors
HOV + TSP	Priority Bus Corridors
BRT + TSP	BRT Corridors

Key Features

- Other Existing Regional Road Corridors
- Other Proposed Regional Road Corridors
- New North Regional Road Corridor, subject to ongoing MCEA study
- Local Municipal Boundaries
- Local Roads
- Provincial Highways
- CP & CN Railways
- GO Railway
- GO Stations
- Future GO Station

Figure 6-3 – 2051 Enhanced Transit Alternative Solution — Transit Priority Corridor Infrastructure Network in Round 2

0 2 4 KM

6.1 Macro-Level Performance Metrics for Transit Network

The transit-related metrics were developed for Regional Road Corridors only. Transit-related metrics exclude GO Rail ridership and boarding/alighting for corridor performance calculations; however, GO Bus ridership and boarding/alighting are included where noted to reflect station-related activity along Regional Road Corridors. The metrics include:

- ***Transit Ridership:*** This metric represents the total number of potential transit users along the Regional Road corridors during the AM and PM peak hours, indicating the level of transit priority corridor's impact on transit utilization. The ridership results exclude passengers carried by GO Rail.
- ***Transit Travel Time:*** This metric represents the average transit travel time on Regional Road corridors, weighted by the number of potential transit users. It provides an indication of overall transit travel efficiency within the corridor network.
- ***Boarding and Alighting:*** This metric shows the total number of potential boarding and alighting along Regional Roads during the AM and PM peak hours. GO Bus passengers are included to reflect station-related activity along Regional Road Corridors.
- ***Transit Speed:*** This metric represents the average operating speed of transit along Regional Roads, weighted by corridor length to account for variations in segment distances. It provides an indication of potential general overall transit efficiency.

Table 6-1 provides a comparative summary of transit-oriented performance metrics across the Round 2 alternative networks and the Round 3 Preferred Transportation Network Strategy, illustrating relative differences in transit utilization, service levels, and travel efficiency. The results indicate higher levels of transit ridership along Regional Road corridors under the Preferred Strategy compared to the Round 2 alternatives. Boarding and alighting activity along Regional Roads shows a consistent upward trend, reflecting increased use of Transit Priority Corridors.

Table 6-1 – Transit-oriented performance metrics for Round 2 and Round 3

Transit Performance Metrics	Peak Hour	Round 2			Round 3
		2051 Base Case Network	2051 Core Transit Network	2051 Enhanced Transit Network	2051 Preferred Transportation Network Strategy
Total Transit Ridership on Regional Road Corridors	AM	17,500	19,250	19,750	27,800
	PM	29,900	32,100	33,900	50,250
Weighted Average Transit Travel Time per user (minutes)	AM	24	23	22	17
	PM	30	27	26	19
Boarding and Alighting along Regional Roads in Hour	AM	23,800	25,800	26,400	32,500
	PM	45,000	50,000	52,000	67,000
Weighted Average Transit Speed (km/h)	AM	31	34	36	39
	PM	29	33	35	37

6.2 Macro-Level Performance Metrics for Auto Network

The auto-related metrics were developed for regional corridors and include:

- ***Total Vehicle-Kilometers Travelled (VKT):*** This metric represents the total vehicle-kilometers travelled on Regional Roads by auto vehicles, including both drivers and passengers, during the AM and PM peak hours. This metric reflects overall auto vehicle travel demand and the extent of regional roadway usage across the network.
- ***Total Time Spent on the Network (TSN):*** This metric represents the cumulative amount of time that auto drivers and passengers spend travelling on Regional Roads during the AM and PM peak hours. This metric indicates overall travel demand and the efficiency of traffic movement along regional roads.
- ***Weighted Average Travel Speed:*** This metric shows the average travel speed of auto vehicles on Regional Roads, weighted by segment length to account for corridor distances. It indicates the overall traffic operational efficiency along the regional road network.
- ***Weighted Average Volume-to-Capacity (V/C) Ratio:*** It represents the average V/C ratio on Regional Roads, weighted by segment length to reflect the relative extent of each corridor. It indicates how efficiently roadway capacity is being used.

The auto driver and passenger performance metrics for the Round 2 and Round 3 scenarios are summarized in **Table 6-2**. Relative to the Round 2 Base Network, the Preferred Transportation Network Strategy (Round 3) showed relatively low total VKT and TSN on Regional Roads in both the AM and PM peaks, indicating a reduction in auto kilometres and time spent in congestion. Furthermore, the weighted average speeds were similar across the network scenarios. However, the weighted average V/C ratios were slightly lower in the Preferred Transportation Network Strategy, compared to the Round 2 networks, which indicated that available capacity is being used more efficiently and that congestion is slightly reduced on the Regional Road corridors.

Table 6-2 – Auto-oriented performance metrics for Round 2 and Round 3

Auto Performance Metrics	Peak Hour	Round 2			Round 3
		2051 Base Case Network	2051 Core Transit Network	2051 Enhanced Transit Network	2051 Preferred Transportation Network Strategy
Total VKT along Regional Roads (000's km)	AM	626	561	540	567
	PM	723	648	618	662
Total TSN along Regional Roads (000's hours)	AM	19	18	18	17
	PM	25	23	22	23
Weighted Average speed on Regional Roads (km/h)	AM	47	44	45	47
	PM	41	38	41	42
Weighted Average V/C Ratio along Regional Roads	AM	0.78	0.81	0.75	0.73
	PM	0.90	0.94	0.87	0.85

7.0 Conclusion

The Integrated Master Plan's travel demand analysis followed a structured and iterative process to develop and assess Halton Region's 2051 Preferred Transportation Network Strategy. This structured evolution ensured that the Preferred Strategy reflects an integrated and comprehensive combination of infrastructure improvements for transit and roadway to support Halton Region's long-term travel demand.