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THE CORPORATION OF THE CITY OF BRANTFORD

CITY OF BRANTFORD

2020 BRANTFORD TRANSPORTATION MASTER PLAN UPDATE - 2051 ADDENDUM

September 2021

FINAL

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Introduction

Background

This Transportation Master Plan (TMP) addendum has been prepared to assess the impacts of the incorporation of the most recent 2051 growth forecasts from the Province into the City's Official Plan – Envisioning Our City 2051. The assumptions and recommendations from the 2020 Transportation Master Plan based on a 2041 horizon land use forecasts have been re-assessed and confirmed for a 2051 horizon.

Technical elements of the 2020 TMP Update have been updated as appropriate to reflect 2051 forecast conditions. The reallocation and incremental change in growth have been assessed to understand the impact of these differences on the recommended capital projects arising from the 2020 TMP.

Addendum Objectives

The following objectives were set for this TMP Addendum:

1. Compare the new Provincial Growth Plan 2051 land use forecasts to the previous 2041 forecasts used for the 2020 TMP Update;
2. Incorporate the 2051 land use forecasts into the City's strategic transportation model and assess the network performance changes for the various network alternatives tested;
3. Confirm the TMP findings for the long-term horizon related to the network constraints and the adequacy of the TMP recommended transportation strategy; and
4. Re-assess as necessary the implementation costs for the recommended transportation strategy.

Addendum Approach

The approach used for this addendum is described as follows:

- Allocate the 2051 land use forecasts to the Traffic Analysis Zones (TAZ);
- Re-assess the strategic transportation model trips generation, distribution, and assignment to the alternative networks tested on the 2020 TMP Update:
  - Do-Minimal;
  - Maximize Travel Demand Management (TDM Max); and
  - Maximize Infrastructure Supply (Infrastructure Max).
- Assess the differences between the original TMP, based on the 2041 assessment of the alternatives and the new 2051 assessment to determine residual or new capacity constraints in the network; and
- Identify additional service or infrastructure required to address the 2051 constraints and prepare cost estimates for the recommended transportation strategy.

Foundations

Impacts of Growth

The Growth Plan for the Greater Golden Horseshoe identifies the growth directions for population and employment growth within the City.

Ultimately, as per the Growth Plan, the City's population is expected to grow from 101,700 people in 2016 to 165,000 people by 2051. Employment is expected to grow from 44,900 in 2016 to 80,000 people by 2051, as shown in ***Table ES-1***.

Table ES-1: Population and Employment Growth - Brant and Brantford

Demographic Area	2016	2051	Growth
Population			
County of Brant	38,000[1]	59,000[2]	55%
City of Brantford	101,700[3]	165,000[2]	62%
Total	**139,700**	**224,000**	**60%**
Employment			
County of Brant	15,000[1]	26,000[2]	73%
City of Brantford	44,900[3]	80,000[2]	78%
Total	**59,900**	**106,000**	**77%**

Source: [1] *Greater Golden Horseshoe*: Growth Forecasts to 2051, Hemson Consulting Ltd., 2020
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020
[3] SGL Planning and Design Inc., 2021

The new population and employment data for 2051 was disaggregated to a Traffic Zone level of detail, accounting for detailed planning information within Greenfield Areas, Intensification Corridors and Settlement Area Boundary Expansion Lands, for incorporation into the City's strategic forecasting model. ***Table ES-2*** provides the 2051 totals as per the Growth Plan forecast and as distributed to the Traffic Zone level.

Table ES-2: 2051 Brantford Population and Employment – Comparison of Growth Plan and Traffic Zone Forecasts

	Growth Plan[1]	Traffic Zone[2]
2051 Population	165,000	164,736
2051 Employment	80,000	83,365

Source: [1] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020
[2] SGL Planning and Design Inc., 2021

The TMP considers the 2051 population and employment at a Traffic Zone level for the City of Brantford, and as per the Growth Plan for the County of Brant, for its analysis. ***Figure ES-1*** and ***Figure ES-2*** provide plots of the changes in allocation for each traffic zone between the 2041 forecast used for the 2020 TMP Update and the more recent 2051 forecasts.

Figure ES-1: Population Growth Allocation – Comparison of 2041 and 2051 Forecasts

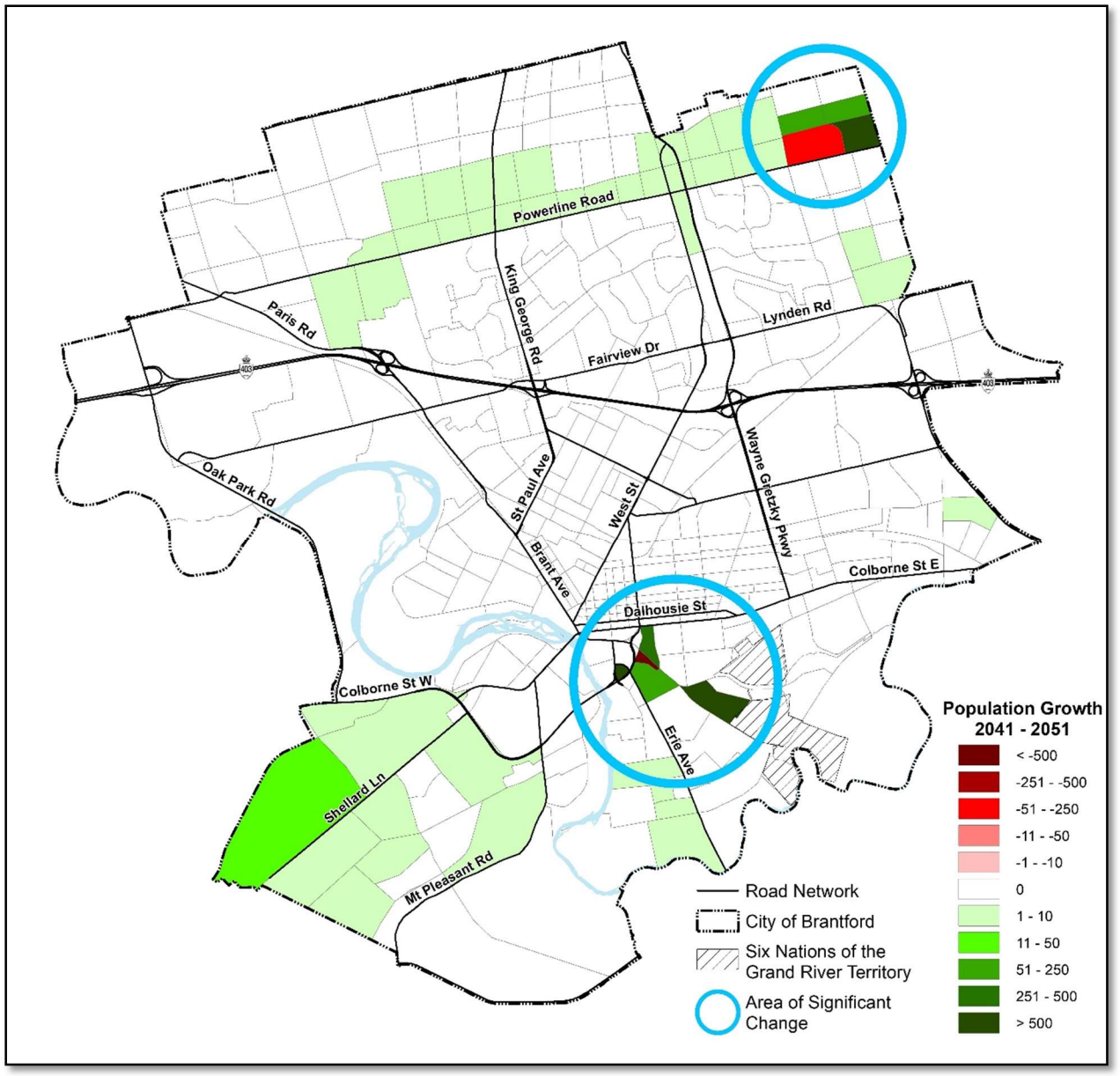
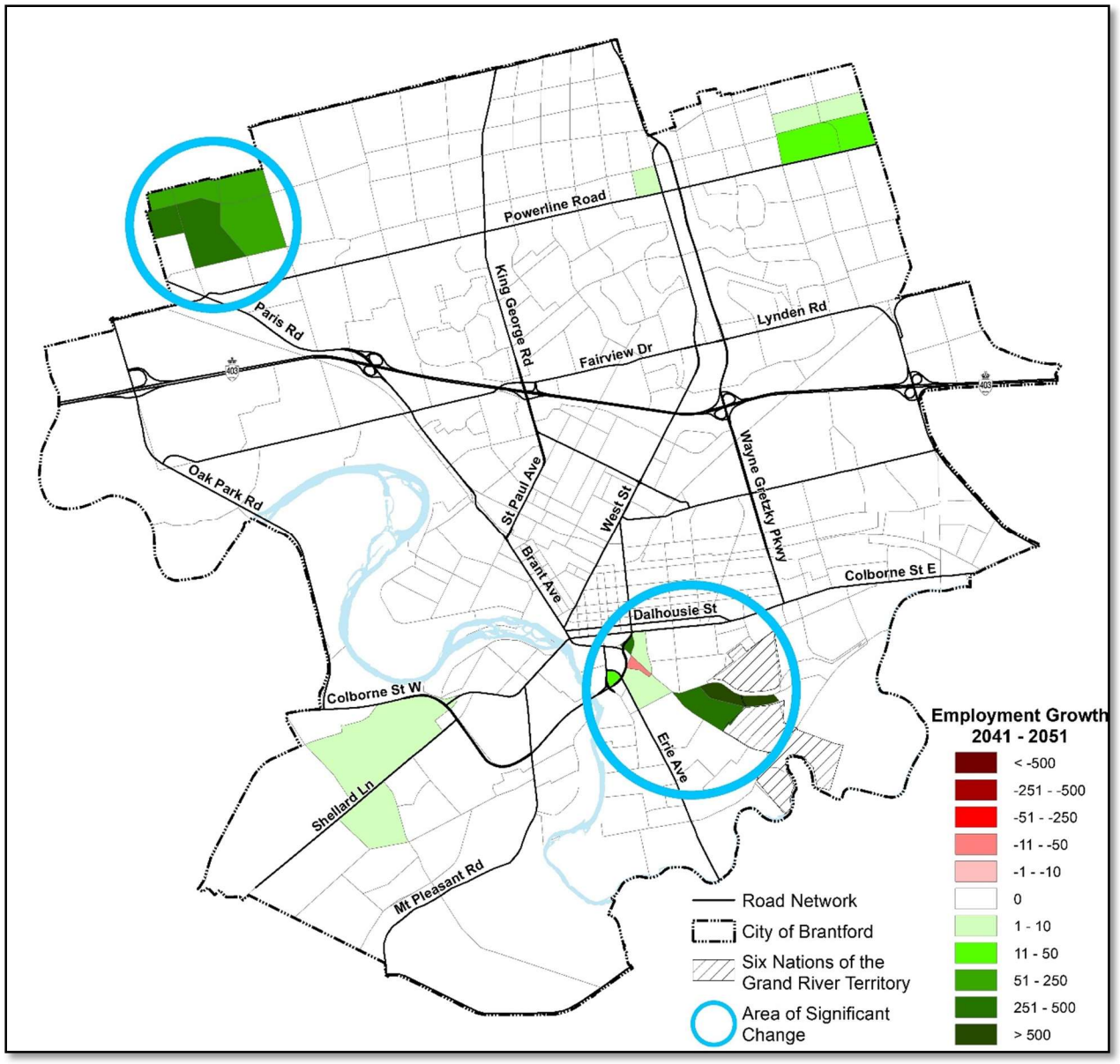


Figure ES-2: Employment Growth Allocation – Comparison of 2041 and 2051 Forecasts



The following is noted with respect to the 2051 forecasts:

- The 2051 not only reflects an increase in population and employment over the 2041 forecasts, it also represents a redistribution of land use between areas. This means the 2051 forecasts do not simply reflect a 10-year growth scenario over 2051, but also a change in the way growth occurs over the short, medium, and long term;
- Areas of population most impacted by the change:
  - North Expansion area - Powerline East block is shown to have an increase in population and redistribution between development blocks; and

  - Mohawk Lake District – population from the Casino area has been reallocated to the Mohawk District
- Areas of Employment most impacted by the change:
  - North Expansion area – Paris Road Employment and the Powerline Road Employment blocks are shown to have an increase in employment.

Growth to 2051 was assessed for a 'Do Minimal' network scenario (reflecting no changes to mode shares or roadway network capacity with the exception of the proposed arterial/collector road network for the expansion lands in Tutela Heights and North Brantford to facilitate access to future lands).

The following 2051 capacity issues are consistent with 2014 TMP model findings for the 2031 horizon:

- Wayne Gretzky Parkway between Henry Street and Highway 403;
- King George Road crossing Highway 403;
- Veterans Memorial Parkway between Mt. Pleasant Street and Market Street South;
- Colborne Street crossing the Grand River;
- Paris Road between Highway 403 and Powerline Road;
- Brant Avenue between St Paul Avenue and Colborne Street; and
- West Street between Charing Cross Street and Henry Street.

However, there are a few notable capacity issues that have emerged in 2051, most notably as a result of the settlement boundary expansion, that were not present in the 2014 TMP findings for the 2031 horizon:

- Powerline Road between Paris Road and Wayne Gretzky Parkway;
- Wayne Gretzky Parkway north of Highway 403;
- Hardy Road between Ferrero Boulevard and Paris Road;
- Paris Road south of Highway 403;
- Erie Avenue between Veterans Memorial Parkway and Birkett Lane; and
- Highway 403 / Oak Park Road interchange.

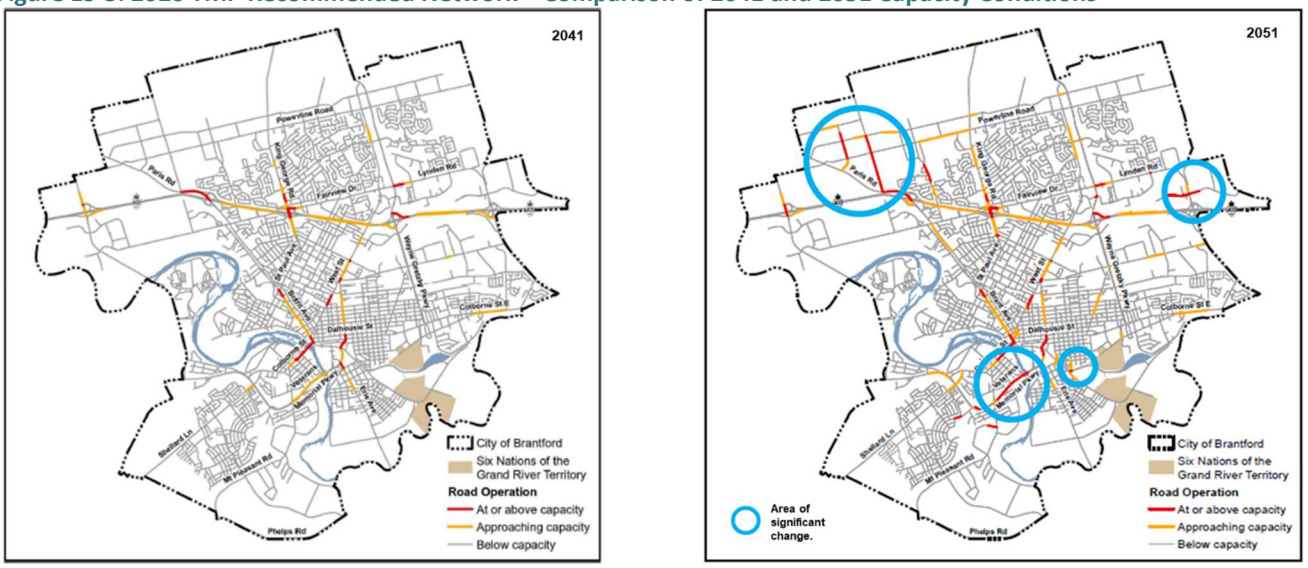
Transportation System Review

The updated land uses were used to generate new volume forecasts for the recommended 2051 network strategy, including increased Travel Demand Management (TDM, including target increases in active transportation and transit) and infrastructure projects. The results of the 2051 assignment to the recommended network revealed the following potential capacity issues in the network, beyond those identified in the TMP 2041 assessment:

- Highway 403 / Oak Park Road interchange;
- Golf Road between Paris Road and the new East-West Road north of Powerline Road; and
- Mohawk Street/Greenwich Street/Murray Street intersection.

Figure ES-3 provides a summary of the comparison of the 2041 and 2051 capacity conditions on the TMP recommended network.

Figure ES-3: 2020 TMP Recommended Network – Comparison of 2041 and 2051 Capacity Conditions



A detailed review of the volume-to-capacity assessment revealed the following related to these constraints.

- Highway 403 / Oak Park Road interchange:
  - The interim design for the interchange was shown to be working at full capacity in 2041
  - The increased volume on the bridge structure related to the ultimate 2051 land use in the Paris Road and Powerline employment blocks results in traffic demands on the bridge being over its capacity in the peak period
  - The full buildout of the employment areas to the north will necessitate the implementation of the ultimate interchange design
  - **MTO/City undertaking: EA complete, Design complete, timing of improvement to be confirmed**
- Golf Road between Paris Road and the new East-West Road north of Powerline Road:
  - The 2041 recommendation: implement Transportation System Management (TSM) initiatives to address the performance constraints
  - **Minor enhancements of the proposed TSM will accommodate the increase in volume to 2051**
- Mohawk Street/Greenwich Street/Murray Street intersection:
  - The 2051 assignment results do not identify the need for a strategic capacity improvement, meaning the 2041 recommendations remain valid
  - The 2051 assignment does identify the need for a local operational improvement to accommodate Mohawk Lake District site traffic

- **Technical study (Traffic Impact Study) required to confirm operational requirements as part of development application**

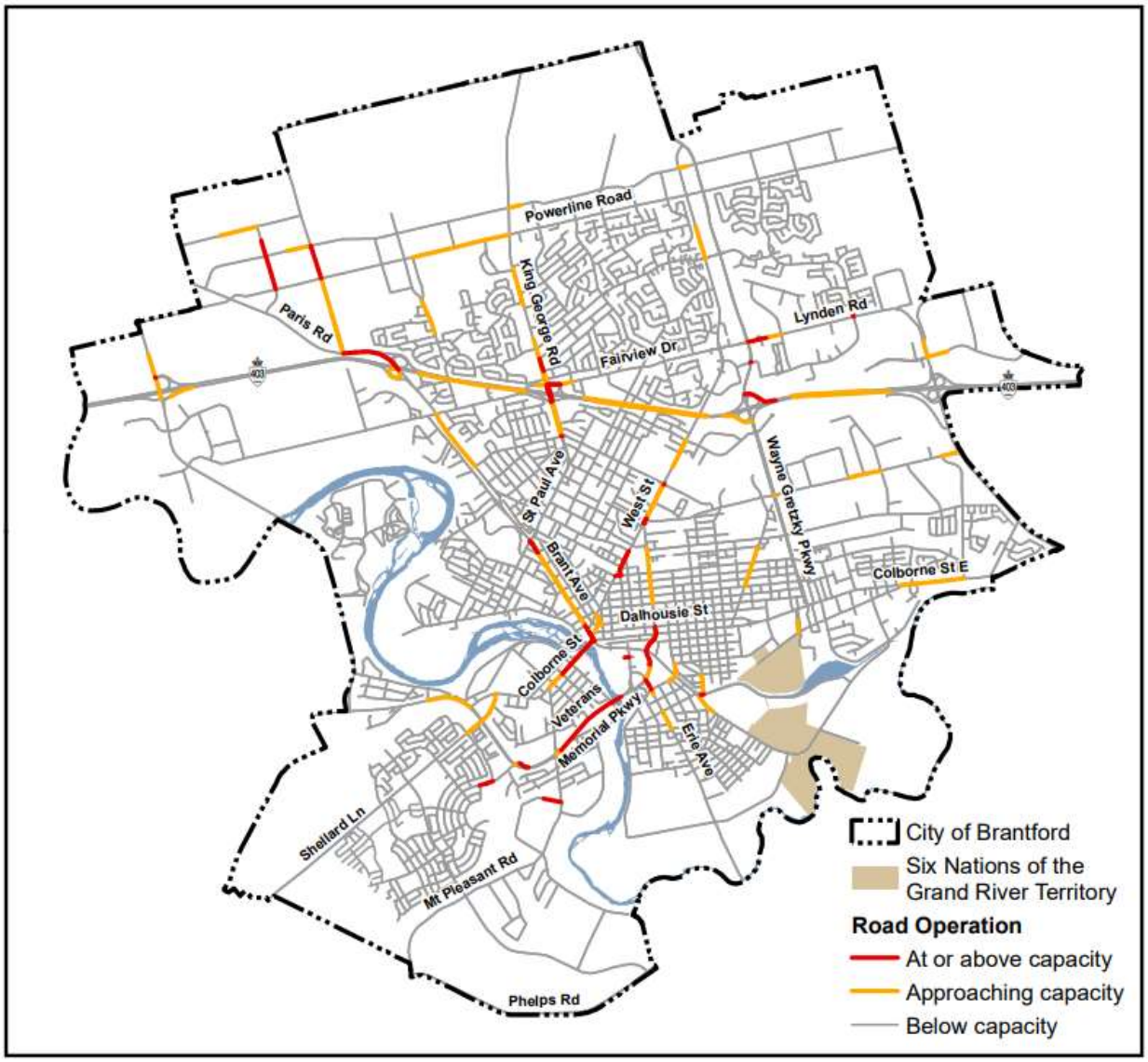
Recommended Network

The preferred solution to address the forecast growth of the City to 2051 is a combined scenario that includes the following elements: transit service improvement/enhancements to promote increased transit use; the provision of active mode infrastructure to promote increased cycling and walking; and network infrastructure improvements to address the capacity constraints in the network. This solution results in a network and demand solution that addresses the identified long-term network deficiencies.

The performance of this combined scenario 2051 Recommended Plan shows that almost all of the anticipated roadway capacity issues identified for 2051 Do-Minimal condition (where no long-term investment was made in transit service, active transportation, or infrastructure) are resolved.

Figure ES-4 identifies the few remaining capacity/operational issues in the 2051 Recommended Network. The remaining capacity/operational issues include the Lorne Bridge, Clarence Street/Clarence Street South between Icomm Drive and Colborne Street East, and Paris Road. The transportation assessment suggests that while these are identified as capacity constraints in the long term, the magnitude of the issue has been significantly reduced. These issues are now forecast to be marginal and can be successfully managed in the near- and mid-term. These locations should continue to be monitored to identify the significance of any emerging issue. It is also recommended that lands be protected in the Veterans Memorial Parkway partial extension (to Murray Street) corridor such that the opportunity to implement this improvement is not lost in the very long term.

Figure ES-4: 2051 Recommended Network: Capacity Constraints



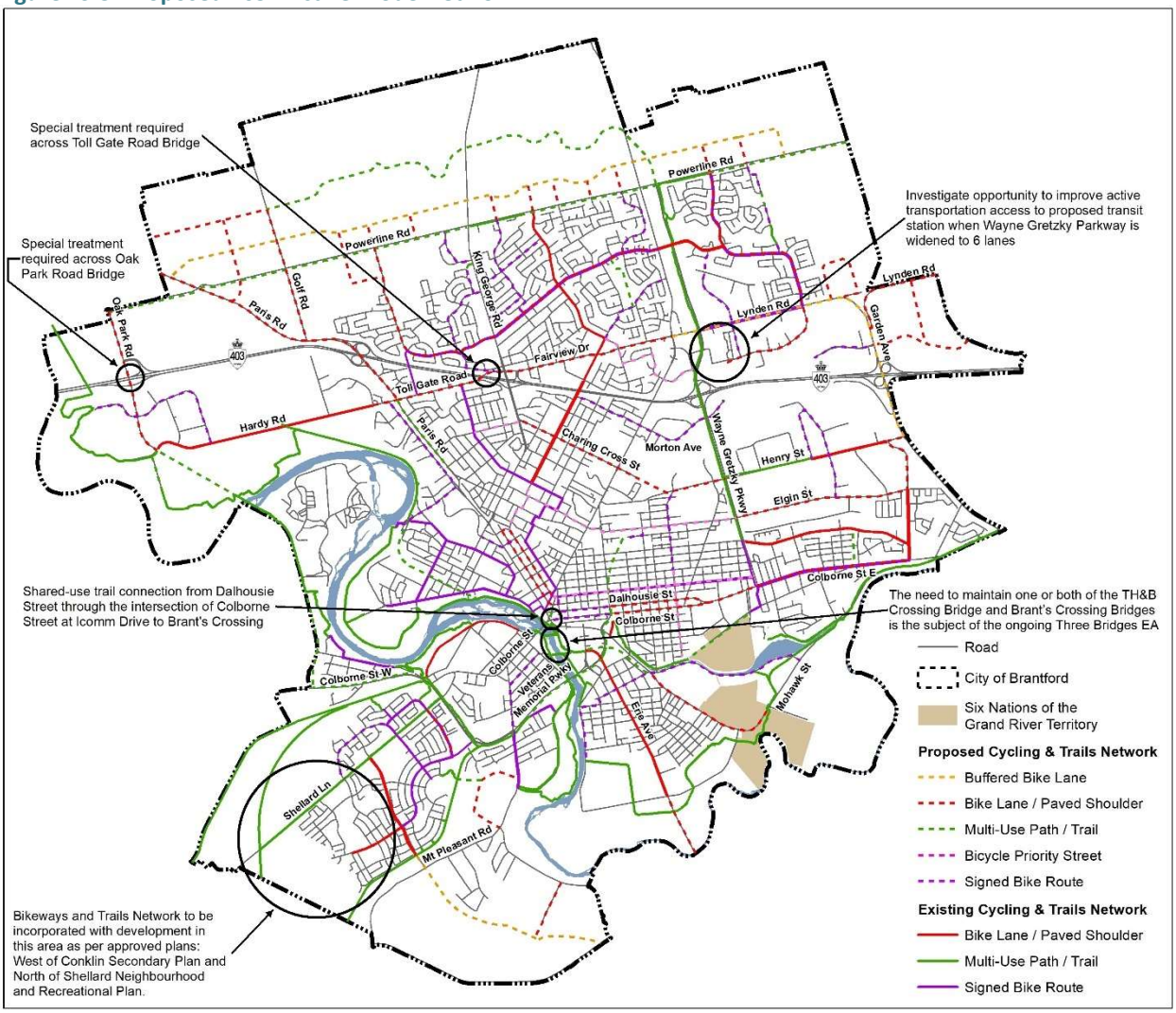
Recommended Plan

Active Transportation

The Active Transportation Plan remains as documented in the 2020 TMP Update.

The proposed cycling infrastructure is shown in ***Figure ES-5***. The implementation of this plan will increase the current 67.4 km of on road cycling to 141 km by adding 74 center-line kilometres of bike lanes; 30 km of multi-use paths and trails and a program for encouraging more AT as the city expands.

Figure ES-5: Proposed 2051 Active Mode Network

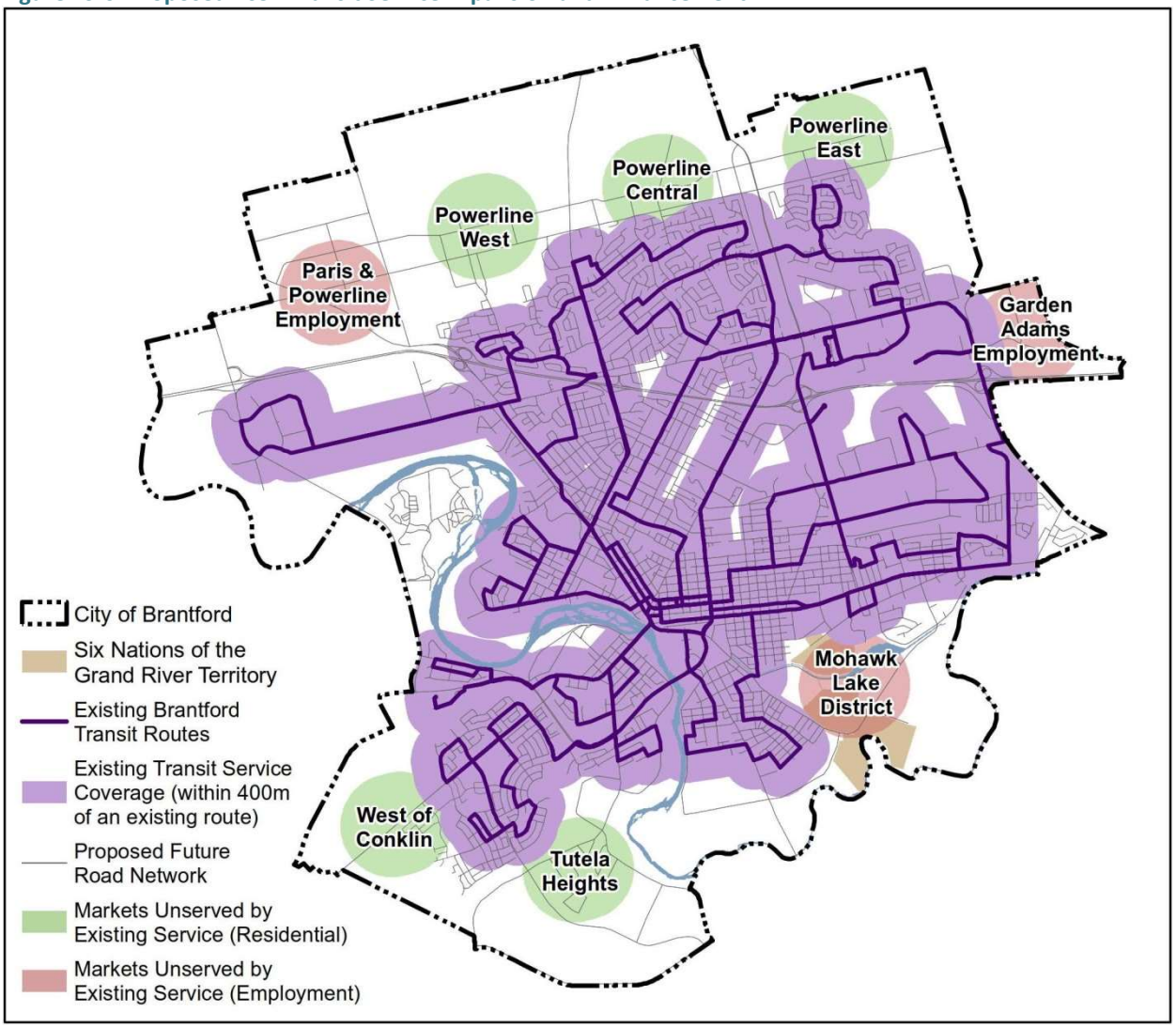


Transit

The Transit Plan remains as documented in the 2020 TMP Update.

The objectives with respect to the system coverage and expansion requirements for transit system are identified in ***Figure ES-6***.

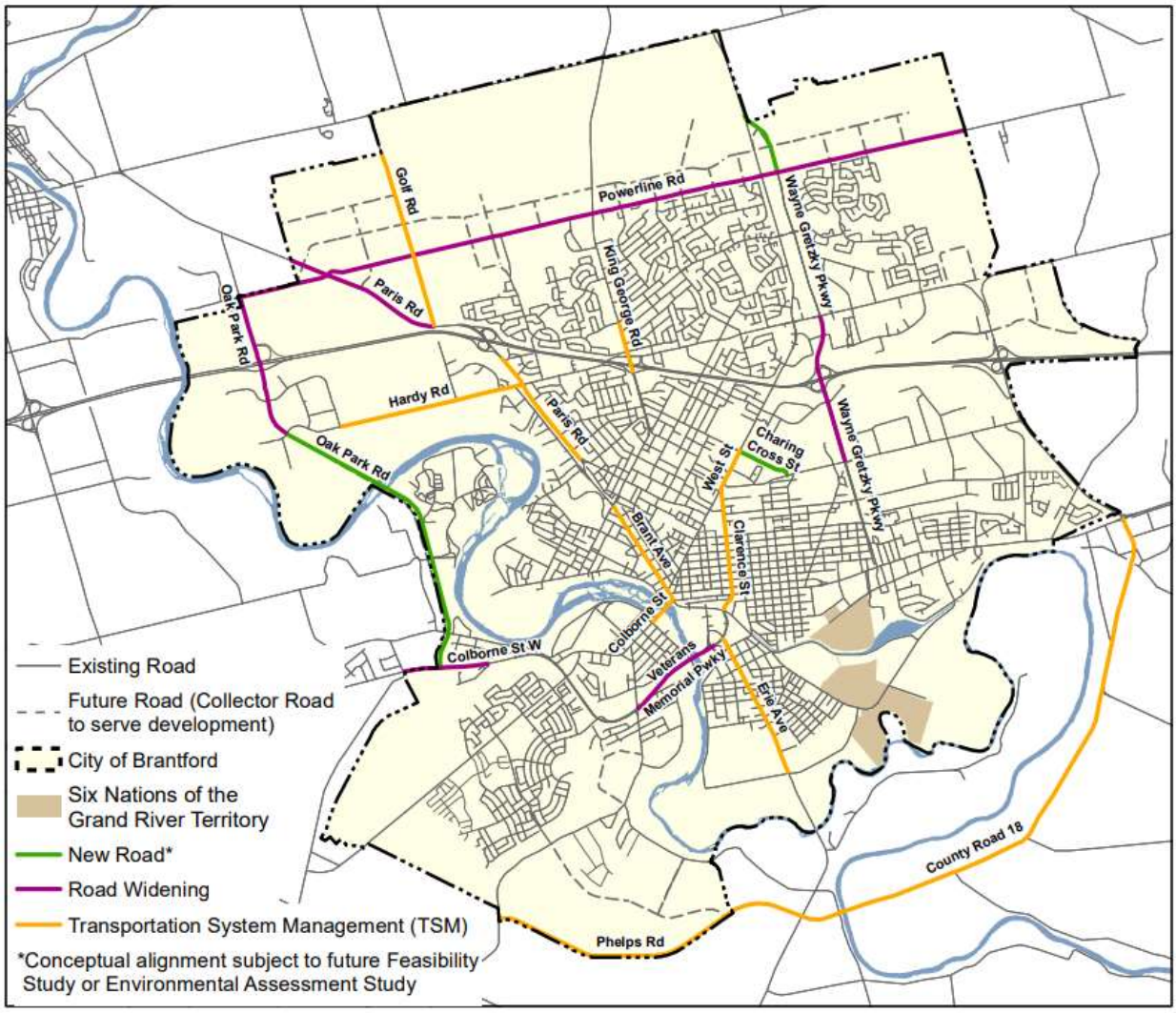
Figure ES-6: Proposed 2051 Transit Service Expansion and Enhancement



Road Infrastructure

From the transportation assessment, the road infrastructure improvements for the 2051 horizon year have been identified as shown on ***Figure ES-7***.

Figure ES-7: Proposed 2051 Road Network



The enhancements include infrastructure widening on:

- Wayne Gretzky Parkway between Henry Street and Lynden Road;
- Veterans Memorial Parkway between Mount Pleasant and Market Street South;
- Colborne Street West from County Road 7 to the existing 4-lane section;
- Paris Road from Golf Road to City Limits;
- Oak Park Road from Hardy Road to Powerline Road (including the Highway 403 interchange upgrade to ultimate design); and
- Powerline Road from Oak Park Road to the City east limits.

New road additions include:

- Oak Park Road extension to Colborne Street West;
- Wayne Gretzky Parkway extension to connect with Park Road;
- East-West Collector Road north of Powerline from Oak Park Road to East City Limits;
- Conklin Road Extension from Mt. Pleasant Road to Phelps Road; and
- Charing Cross Street extension to Henry Street.

TSM improvements to enhance the existing capacity (through urbanization, parking restrictions, and operational improvements) are proposed for several corridors including:

- Golf Road;
- Paris Road;
- Brant Ave;
- Hardy Road;
- West Street;
- King George Road;
- Erie Avenue;
- Clarence Street; and
- County Road 18 (note that this is a County Road. The City will work with the County to determine potential for improvements to the corridor).

It is also recommended that lands be protected in the Veterans Memorial Parkway partial extension (to Murray Street) corridor such that the opportunity to implement this improvement is not lost in the very long term

All of the projects identified will require a Schedule B or C MCEA to be completed, which would include significant public/stakeholder consultation, before they can be implemented.

Implementation Plan

Active Transportation Plan

As the Active Transportation plan elements were derived based on the provision of connected and continuous infrastructure the plan does not change from that recommended in the 2020 TMP Update.

Transit Service Plan

The Short and Mid-Term transit improvements for the transit system do change from that recommended in the 2020 TMP Update. However, in extending the time horizon from 2041 to 2051 additional maintenance and equipment replacement costs are required to support the future transit service. ***Table ES-3*** summarizes the additional costs to support the additional transit service requirements.

Table ES-3: Additional 2051 Transit Service Recommendations

Capital Item	Description	Cost ($000)*
Long Term [2042 – 2051]		
Fleet	5 new vehicles, 12 replacement vehicles	$18,700
Building	-	-
Transfer Points	-	-
Route Infrastructure	New Stops/ Shelters Expansion Routes/ITS	$1,620
Studies	Transit Master Plan Update	$100
Specialized	Vehicle Replacement, Software Upgrade	$5,800
	Total	**$26,220**

* All costs stated in 2020 dollars

Road Infrastructure Plan

The capital cost to provide the additional infrastructure recommended for the 2051 condition, beyond that recommended in the 2020 TMP Update is provided in ***Table ES-4***. There are no additional capital costs associated with the subsequent minor TSM enhancements on Golf Road.

Table ES-4: Additional 2051 Road Infrastructure Recommendations

Project	Description	Cost ($000)*
Mid Term [2026 – 2031]		
Mohawk Street / Greenwich Street / Murray Street Intersection	Intersection realignment and improvements	$3,600
Long Term [2042 – 2051]		
Highway 403 / Oak Park Road Interchange	Upgrade to ultimate configuration	$18,000
	Sub-Total	**$21,600**

* *All costs stated in 2020 dollars* & Contingency of 20% for Construction and 30% for Engineering assumed unless stated specifically in reference reports (i.e. feasibility reports).

Conclusions

The impacts of the change in provincial land use projections from the 2041 to 2051 horizon on the recommended transportation strategy and infrastructure requirements as identified in the 2020 TMP Update have been assessed. The following is concluded:

- The overall change in long term population and employment between 2041 (as assessed for the TMP) and 2051 is not significant. City of Brantford population increases by approximately 2,000 persons and employment increases by approximately 3,000 persons by the revised horizon year;
- The most significant growth is in the Northwest /Powerline Industrial Park Employment Area;
- There is a slight change in the way that population and employment growth is allocated within the City. The most significant change is the reallocation of population and employment growth from the Casino area to the Mohawk Lake District;

- The 2051 transportation demands as assigned to the 2041 recommended network strategy show only a few areas where additional improvements will be required:
  - Mohawk Street / Greenwich Street / Murray Street – local improvements;
  - Golf Road from Paris Road to north of Powerline Road – additional TSM; and
  - Highway 403 / Oak Park Road Interchange – new infrastructure.
- The recommendations in the 2020 TMP Update related to Active Transportation and Transit remain valid;
- The implementation strategy is not affected by the change from the 2041 to 2051 horizon; and
- Costs have been added to reflect the additional service and infrastructure required to support growth the 2051 horizon year.

The following report updates the sections of the 2020 Transportation Master Plan Update for those assessment elements that have been updated to reflect the 2051 condition.

1.0 Study Foundation

1.1 Background

This Transportation Master Plan (TMP) addendum has been prepared to assess the impacts of the incorporation of the most recent 2051 growth forecasts from the Province into the City's Official Plan – Envisioning Our City 2051. The assumptions and recommendations from the 2020 Transportation Master Plan based on a 2051 horizon land use forecasts have been re-assessed and confirmed.

Technical elements of the 2020 TMP Update have been updated as appropriate to reflect 2051 forecast conditions. The reallocation and incremental change in growth have been assessed to understand the impact of these differences on the recommended capital projects arising from the 2020 TMP.

1.2 Study Objectives

The following study objectives were set by the City for this TMP Update:

1. Plan to accommodate city growth to 2051, including the urban boundary expansion of the City of Brantford, the intensification target for development within the Built-Up Area, and density targets within the Designated Greenfield Area as set out in the new Official Plan;
2. Provide transportation infrastructure project and cost input into the Development Charges update;
3. Follow the Master Planning process and key principles of the Municipal Class EA to satisfy EA requirements for the planning phase of Schedule 'B' undertakings, and Phase 1 and 2 for Schedule 'C' projects; and
4. Consult with First Nations, agencies, stakeholders and the public early and continuously throughout the Master Planning process, using various techniques and materials.

Other objectives, constraints and limitations that influenced the development of this TMP Update include:

- **Continue to strive for a "made for Brantford" Master Plan** reflecting the unique characteristics of Brantford and its context while still learning from successes in other similar-sized cities.
- **Show the impacts of "Status Quo" approach to system management,** in terms of addressing deficiencies, level-of-service, and ability to meet planning targets.
- **Coordinate TMP preparation with the City's concurrent Municipal Comprehensive Review (OP) and the Master Servicing Plan (MSP) study** in terms of growth forecasting, consultation activities, and planning of cost efficiencies in the development of new transportation, sewer and water infrastructure.
- **Integrate transportation and land use planning.** Transportation and land use planning has been coordinated to identify bold transportation strategies that will be required to support an overall

sustainability plan for transportation up to 2051, and translate these strategies into Official Plan policy.

- **Work towards becoming a Bicycle Friendly Community** and receiving a designation by Share the Road Cycling Coalition by providing a clear, concise pathway towards a more bicycle friendly future.
- **Define the future role of public transit.** Reduce the City's environmental footprint by increasing transit use through improved service levels, by effectively serving newly developing areas, meeting the accessibility needs of residents, by considering inter-municipal and inter-regional links, and by considering new micro-transit technologies in support of first/last mile solutions.
- **A Complete Streets philosophy** has been applied to this TMP Update so that streets are planned, built, and maintained for all users.
- **Preparation for Connected and Autonomous Vehicles (CAVs).** Consider how the emergence of CAVs will impact small-sized cities, such as Brantford, and how to strategically prepare for them.

1.3 Study Approach

The approach used in this TMP Update was organized into five (5) distinct project phases:

- **Phase 1: Develop a Study Foundation** – Set the stage and boundaries for the City of Brantford's transportation system.
- **Phase 2: Integrated Transportation Strategy** – Determine integrated strategies for developing networks, programs, and policies for all travel modes in a manner that supports community-building objectives.
- **Phase 3: Street Network Capacity Needs** – Define problems and opportunities for the transportation system.
- **Phase 4: Review of Key Transportation Issues** – Review and assess the relationship between regional and local needs of the transportation network and identify a plan and role for the local system.
- **Phase 5: Implementation Plan** – Bring the elements of the TMP together and develop a practical approach to implement and monitor the TMP transportation network and guide the City forward to the 2051 horizon year.

Our approach and methodology is designed to satisfy EA requirements for the planning phase of Schedule 'B' undertakings, and Phases 1 and 2 for Schedule 'C' projects of the Municipal Class Environmental Assessment (EA) process and follows Master Planning Process Approach #1. The integration of technical and consultation activities is a core element of the process.

Technical analysis and studies required in support of the Schedule B projects in development areas will be undertaken as part of the design process by the developer and approved through the Planning Act Municipal development review process. Other Schedule B projects will be satisfied through separate class EA studies prior to design and construction.

1.4 Stakeholder Agency Consultation

Stakeholder Agency Consultation remains as documented in the 2020 TMP Update.

1.5 Public Consultation

The stakeholder and public consultation session that was conducted as part of the TMP addendum is as follows:

- Notice of Addendum – Posted June 17, 2021 with the 45-Day Review Period ending August 4, 2021.

The notice and public comments for the aforementioned consultation event is included in ***Appendix A***.

1.6 Existing Road Network

The Existing Road Network remains as documented in the 2020 TMP Update.

1.7 Existing Local Roadway Travel Demands

1.7.1 Approach

Approach remains as documented in the 2020 TMP Update.

1.7.2 Existing Automobile Traffic Level of Service (LOS)

Existing Automobile Traffic Level of Service (LOS) remains as documented in the 2020 TMP Update.

1.7.3 Primary Trip Markets

Primary Trip Markets remains as documented in the 2020 TMP Update.

1.8 Existing Transit Network Use

Existing Transit use remains as documented in the 2020 TMP Update.

1.9 Existing Active Transportation

Existing Active Transportation remains as documented in the 2020 TMP Update.

2.0 Transportation Impacts of Growth

2.1 Population and Employment Growth

The most recent *Places to Grow* (August 2020) policies include growth forecasts for the City of Brantford with a residential population of 165,000 and an employment level of 80,000 by 2051.

As part of the City of Brantford's Official Plan Review process, the Ministry growth forecasts were incorporated into a Municipal Comprehensive Review (MCR) as input to the City's new Official Plan (undertaken by SGL Planning and Design Inc. (SGL)). The MCR Part 1 Report, identified an alternative intensification target for the delineated Built-up Area and an alternative Designated Greenfield Area (DGA) density target appropriate for the City of Brantford as well as lands to convert from employment use and whether there was a need for a settlement area boundary expansion and the quantum of that need. The MCR Part 2 Report identified what part of the Boundary Adjustment Lands will be included in the settlement area boundary expansion to accommodate the identified need for urban lands. A majority of the work for the MCR predates the Mohawk Lake District Plan.

The 2051 population and employment forecasts were disaggregated by SGL to match the Traffic Analysis Zone (TAZ) structure within the City's strategic transportation model. The allocations were based on intensification policies and targets, Schedule 1: Growth Management in the City's draft Official Plan, land use designations, and sites with known development potential.

At a summary level, the growth forecasts used in this TMP growth analysis are shown in ***Table 2-1*** and ***Table 2-2*** below for the City of Brantford and County of Brant respectively. Detailed TAZ level population and employment data for Brantford and Brant County (2016 and 2051) can be found in ***Appendix C***.

Table 2-1: City of Brantford Population and Employment to 2051 - TAZ Distribution

Horizon Year	Population (Persons)	Employment (Jobs)
2016	101,700[1]	44,900[1]
2021 Est	111,300	53,600
2026 Est	125,200	60,300
2031	139,000[2]	67,000[2]
2036	152,000[2]	72,000[2]
2041	162,150[1]	80,150[1]
2051	164,736[1]	83,365[1]

Source: [1] SGL Planning and Design Inc., 2021
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019

Table 2-2: County of Brant Population and Employment to 2051 - Growth Plan

Horizon Year	Population (Persons)	Employment (Jobs)
2016	38,000[1]	15,000[1]
2021 Est	41,000	17,000
2026 Est	44,000	19,000
2031	49,000[2]	22,000[2]
2036	53,000[2]	24,000[2]
2041	57,000[2]	26,000[2]
2051	59,000[3]	26,000[3]

Source: [1] *Greater Golden Horseshoe*: Growth Forecasts to 2051, Hemson Consulting Ltd., 2020
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019
[3] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020

Applying updated growth forecasts, disaggregated to the TAZ level-of-detail, the City's model was utilized to forecast future travel demands (i.e. Future Conditions) resulting from population growth, employment growth, and future land use patterns and densities as provided by the City. These were further enhanced using output from the ongoing Official Plan Update. Forecasted Future Conditions and various alternative transportation strategies were subsequently assessed based on the strategic direction criteria are identified in ***Section 2.4*** and in ***Chapter 4.0***.

The population and employment forecasts for the City of Brantford and County of Brant indicate significant growth in the period from 2016 to 2051. The population and employment are expected to grow by 60% and 83% respectively during this 35-year period as shown on ***Table 2-3***.

Table 2-3: Population and Employment Growth - Brant (Growth Plan) and Brantford (TAZ Distribution)

Demographic Area	2016	2041	2051	Growth
Population				
County of Brant	38,000[1]	57,000[2]	59,000[3]	55%
City of Brantford	101,700[4]	162,140[4]	164,736[4]	62%
Total	**139,700**	**219,140**	**223,736**	**60%**
Employment				
County of Brant	15,000[1]	26,000[2]	26,000[3]	73%
City of Brantford	44,900[4]	80,153[4]	83,365[4]	86%
Total	**59,900**	**106,153**	**109,365**	**83%**

Source: [1] *Greater Golden Horseshoe*: Growth Forecasts to 2051, Hemson Consulting Ltd., 2020
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019
[3] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020
[4] SGL Planning and Design Inc., 2021

Figure 2-1 and ***Figure 2-2*** present the population and employment growth from 2016 to 2051. These figures include an expansion of the current urban boundary (Settlement Area) and assign population and employment growth to these areas in conjunction with the parallel Brantford Expansion Area study developed by Dillon in consultation with the City of Brantford. Based on current growth and growth anticipated in the expanded urban boundary, the following trends to the 2051 horizon year are noted:

- High employment growth in the Oak Park Road & Hardy Road (Northwest Industrial Park) and Henry Street/Wayne Gretzky (Braneida Industrial Park) areas;
- High employment growth in the expansion lands east of Garden Avenue at Highway 403 and north of Powerline Road just east of Paris Road;
- High population growth in the southern zones surrounding Shellard Lane, Mt Pleasant Road and Erie Avenue;
- High population growth in the northern expansion zones (north of Powerline Road) from Balmoral Drive in the west to Coulbeck Road in the east;
- High population and employment growth along the King George Road corridor; and
- High population and employment growth in the downtown core.

Intensification within downtown Brantford and along the King George Road corridor will increase the densities within these areas of the city. Denser, more urban areas contribute to modal shifts away from the single occupancy vehicle as the distance to many amenities will decrease, making them more bikeable and walkable, while transit service will increase, as higher densities support higher service frequency.

Figure 2-1: Population Growth by TAZ, 2016 to 2051

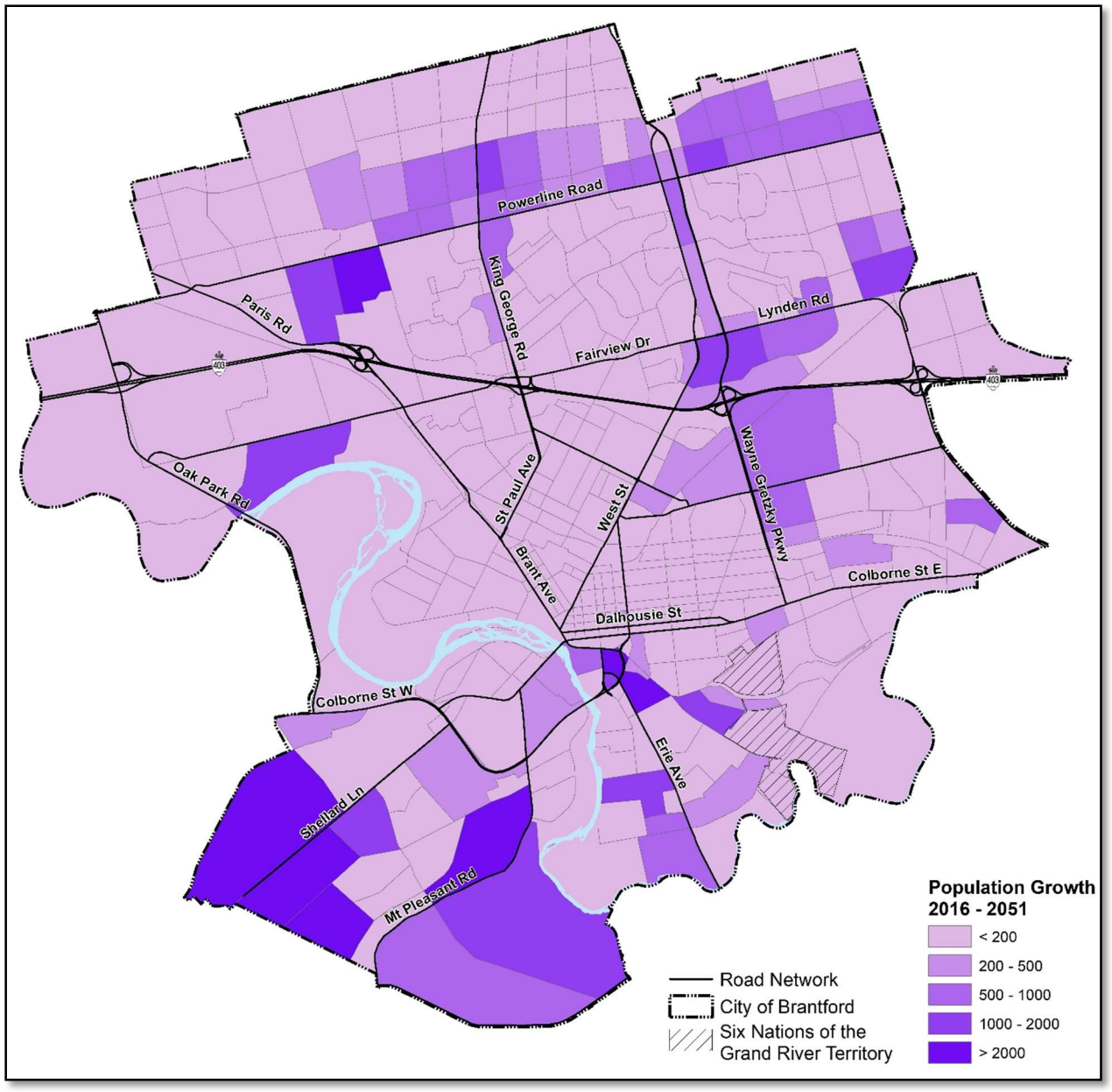
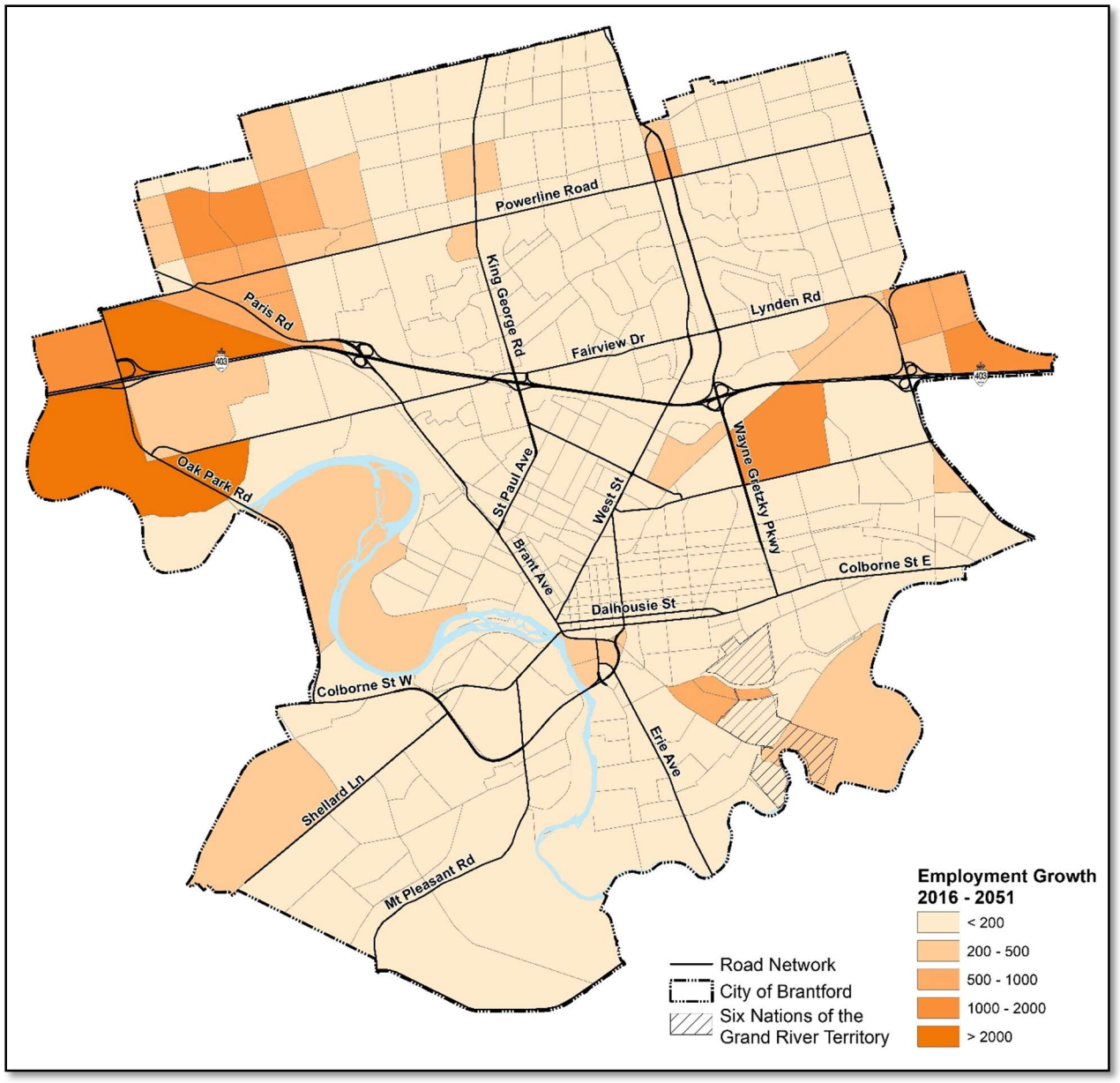


Figure 2-2: Employment Growth by TAZ, 2016 to 2051



2.2 Change in Travel Mode Choice

Change in Travel Mode Choice remains as documented in the 2020 TMP Update.

2.3 Local Travel Growth to 2051

The updated travel forecasting model forecasts travel in the City of Brantford and County of Brant in 2051 first under a "Do Minimal" scenario. In this case, the travel mode choices are unchanged from

2016, and no further capacity improvements (i.e. road widenings, extensions) are included in the model. However, a small number of infrastructure modifications that have been completed since 2016 were included along with the proposed arterial/collector road network for the expansion lands (Tutela Heights & North Brantford). As a result of the Tutela Heights Slope Stability EA, the potential closure of Tutela Heights Road in the vicinity of Davern Road is also incorporated.

Brantford's forecasted growth will significantly alter the local travel demands within the City. ***Table 2-4*** displays the existing (2016) and forecast (2051) trips by mode that originate in Brantford during the AM peak period. By 2051 Brantford is forecast to generate more than 85,900 AM peak period person trips on an average weekday. That's an increase of 72% over 2016 person trips.

Table 2-4: Total trips by mode: Trips Originating in Brantford (Brantford to All) - AM Peak Period

Mode \ Year	2016		2051	
	Trips	%	Trips	%
Auto Driver	36,520	73.2%	63,070	73.4%
Auto Passenger	5,370	10.8%	10,000	11.6%
Transit	1,350	2.7%	1,840	2.1%
Bicycle	330	0.7%	480	0.6%
Walk	3,190	6.4%	5,010	5.8%
Other	3,130	6.3%	5,530	6.4%
Total	**49,890**	**100.0%**	**85,930**	**100.0%**

The total existing (49,890) and forecast (85,930) person trips can be further broken down based on where the trips are destined to. This is displayed in ***Table 2-5***.

Table 2-5: Total trips by destination: Trips Originating in Brantford - AM Peak Period

Destination \ Year	2016		2051	
	Trips	%	Trips	%
Brantford to Brantford	36,980	74.1%	64,720	75.3%
Brantford to Brant County	5,250	10.5%	9,150	10.6%
Brantford to External East (Hwy 403 east)	4,310	8.6%	6,250	7.3%
Brantford to External West (Hwy 403 west)	490	1.0%	750	0.9%
Brantford to External North (Hwy 24 north)	1,440	2.9%	2,100	2.4%
Brantford to External Other	1,420	2.8%	2,960	3.4%
Total (Brantford to All)	**49,890**	**100.0%**	**85,930**	**100.0%**

Table 2-5 indicates that in the 2051 forecasted scenario there is higher proportion (1.2 percentage points) of internal (Brantford to Brantford) trip making, while conversely an equal reduction of the proportion of Brantford to External trip making. The increase in local trips is likely the result of the significant increase in employment and participation rate that is forecast for Brantford.

2.4 2051 Local Travel Assignment and Network

The updated population and employment forecasts for the horizon year, travel mode choice, and trips distribution information, as described in ***Sections 2.1*** through ***2.3*** above, were incorporated into the City's travel demand model and assigned to the horizon year network to produce future base year volume forecasts on the road network. This process and the resultant forecasts are described in the following sections.

2.4.1 Updated Mobility Model for Transportation

Update Mobility Model for Transportation remains as documented in the 2020 TMP Update.

2.4.2 Private Auto Traffic

As previously reported in ***Section 2.1*** of this TMP, population and employment forecasts for the City of Brantford are expected to grow by 62% and 78%, respectively, between 2016 and 2051. A 2051 'Do Minimal' scenario reflects no changes to peak hour mode shares and only short term committed projects (e.g. The 2020 Oak Park Road/Highway 403 interchange upgrade) and the arterial/collector roads required to support the expansion lands (Tutela Heights & North Brantford). ***Figure 2-3*** displays the 2051 'Do Minimal' road network. The proposed additional roads in Tutela Heights (Conklin Road Extension) and North Brantford (New East/West Road, etc.) are illustrated in this figure. ***Figure 2-4*** illustrates the assignment of private auto vehicles on the 2051 network in the PM peak hour and ***Figure 2-5*** illustrates the same assignment of private auto vehicles on the 2051 network measured against roadway capacity as a volume/capacity (V/C) ratio. ***Table 2-6*** provides an overview of the AM and PM screenline summaries, using the same screenlines defined for the model validation (illustrated in ***Figure 2-3*** of the 2020 TMP Update). Unlike the screenline analysis used to validate the auto travel within the model, the screenline summaries in ***Table 2-6*** evaluate the cumulative travel demand on the roadways crossing the screenline. The cumulative travel demand crossing the screenline is compared to the cumulative capacity crossing the screenline in order to establish V/C ratio, which provides an indication of how well a specific corridor/screenline is operating. It is important to note that while some screenlines are operating within capacity, there may be links on the screenline that have operating deficiencies, as identified in ***Figure 2-5***. Detailed link summary tables for each screenline can be found in ***Appendix C***.

The aforementioned figures and table illustrate the following 2051 PM peak hour capacity issues that are consistent with 2014 TMP model findings for the 2031 horizon:

- Wayne Gretzky Parkway between Henry Street and Highway 403;
- King George Road crossing Highway 403;

- Veterans Memorial Parkway between Mt. Pleasant Street and Market Street South;
- Colborne Street crossing the Grand River;
- Paris Road between Highway 403 and Powerline Road;
- Brant Avenue between St Paul Avenue and Colborne Street; and
- West Street between Charing Cross Street and Henry Street.

However, there are a few notable capacity issues that have emerged in 2051, most notably as a result of the settlement boundary expansion, that were not present in the 2014 TMP model findings for the 2031 horizon:

- Powerline Road between Paris Road and Wayne Gretzky Parkway;
- Wayne Gretzky Parkway north of Highway 403;
- Hardy Road between Ferrero Boulevard and Paris Road;
- Paris Road south of Highway 403; and
- Erie Avenue between Veterans Memorial Parkway and Birkett Lane.

Figure 2-3: Future (2051) 'Do Minimal' Road Network

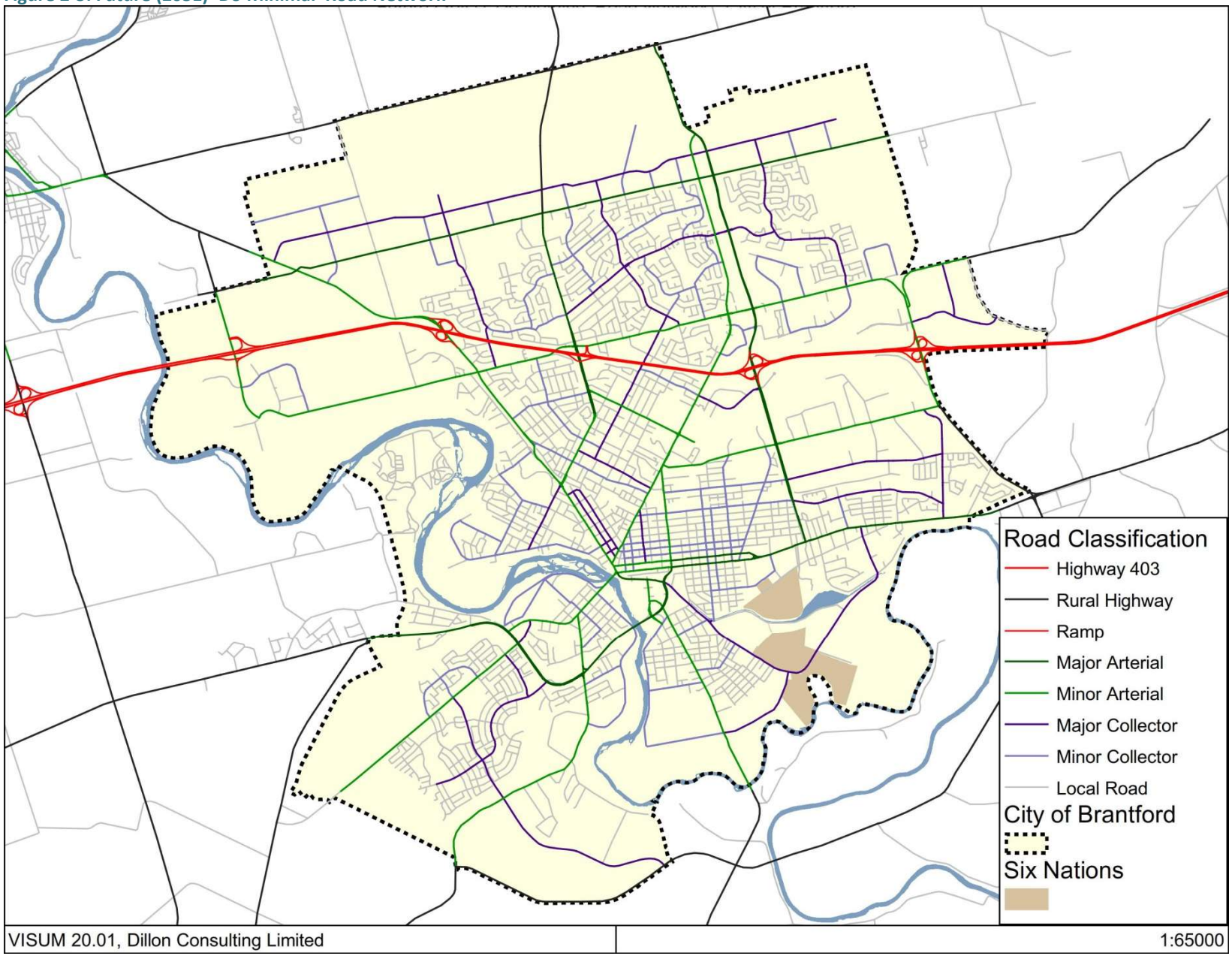


Figure 2-4: Future (2051) 'Do Minimal' Traffic Volumes- PM Peak Hour

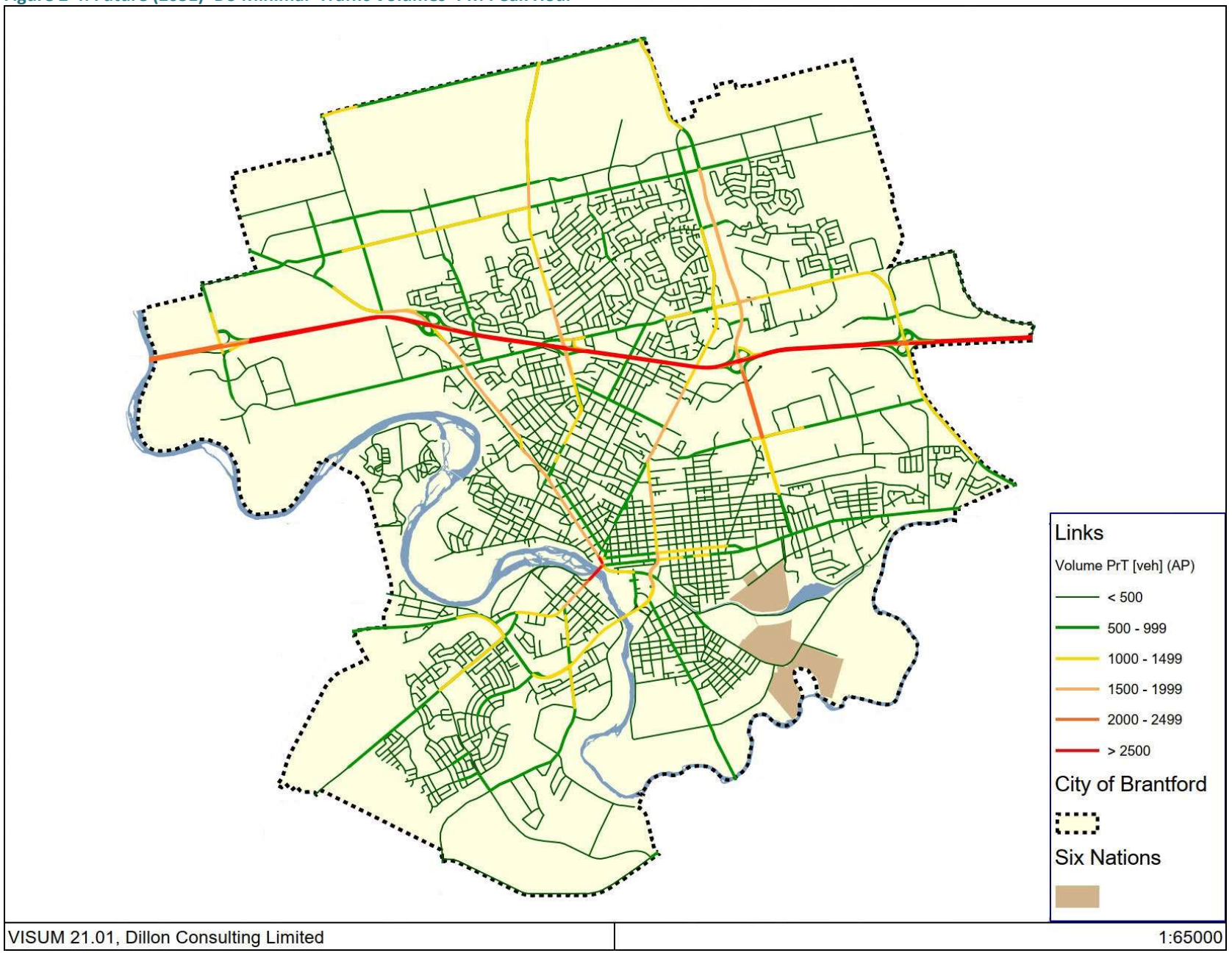


Figure 2-5: Future (2051) 'Do Minimal' Volume-to-Capacity Ratio - PM Peak Hour

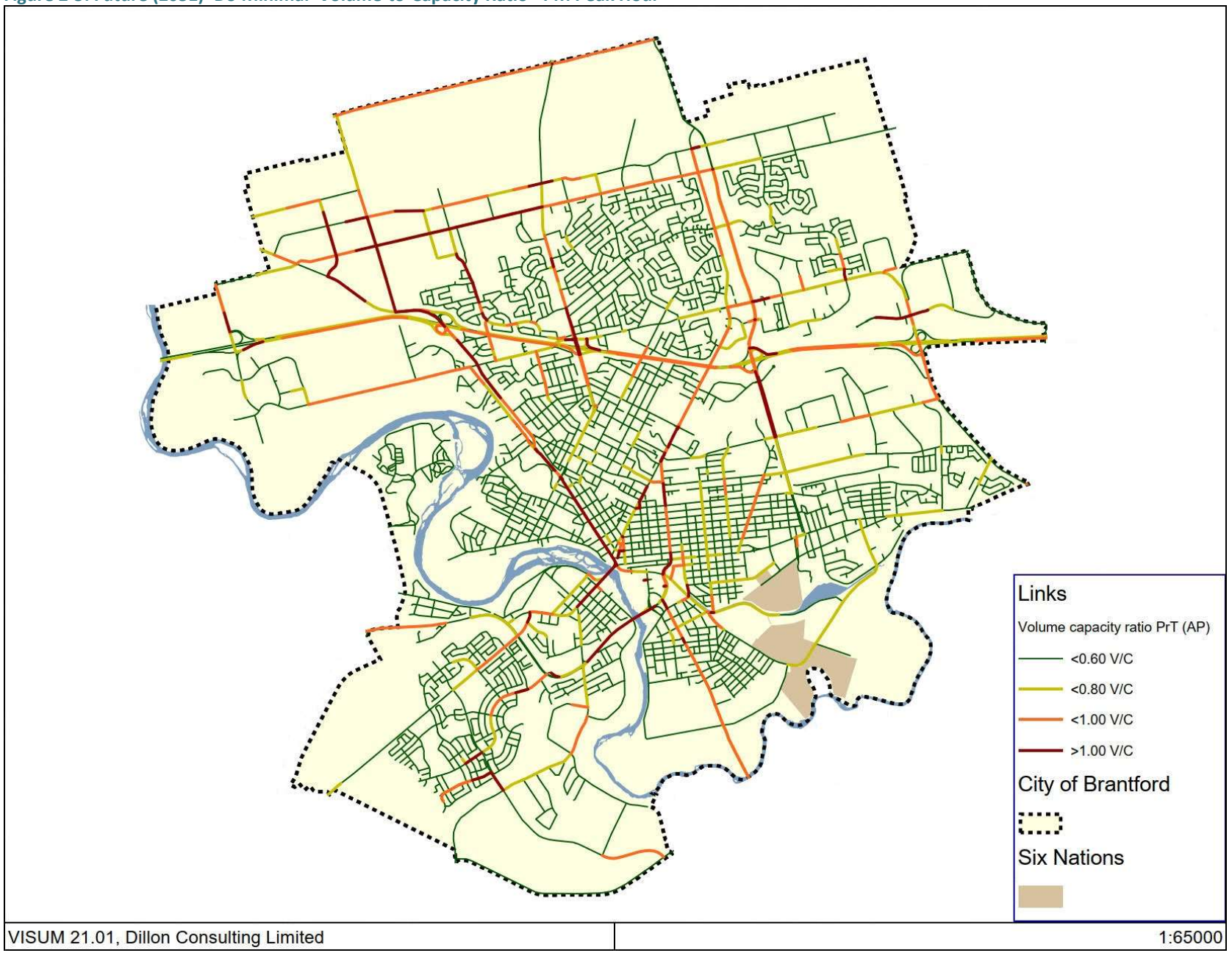


Table 2-6: Future (2051) 'Do Minimal' Screenline Summary

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	7	8,100	6,752	0.83	6,199	0.77
1	Grand River South	WB	7	8,100	4,433	0.55	7,639	0.94
2	Grand River North	EB	4	5,200	3,176	0.61	4,185	0.80
2	Grand River North	WB	5	6,000	2,779	0.46	3,918	0.65
3	Highway 403	NB	13	10,800	7,023	0.65	9,262	0.86
3	Highway 403	SB	13	10,800	7,463	0.69	9,431	0.87
4	King George Road	EB	11	9,600	5,254	0.55	8,699	0.91
4	King George Road	WB	11	9,600	6,998	0.73	7,417	0.77
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,518	0.59	6,592	0.87
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,604	0.74	5,969	0.79
6	Wayne Gretzky Parkway (South)	EB	7	4,900	1,950	0.40	2,336	0.48
6	Wayne Gretzky Parkway (South)	WB	7	4,900	1,621	0.33	2,802	0.57
7	Memorial Drive	EB	9	6,100	1,670	0.27	3,158	0.52
7	Memorial Drive	WB	9	6,100	2,434	0.40	2,690	0.44
8	West Street	EB	6	4,300	2,165	0.50	3,109	0.72
8	West Street	WB	6	4,300	2,661	0.62	3,076	0.72
9	CNR Corridor	NB	11	7,900	4,413	0.56	5,190	0.66
9	CNR Corridor	SB	11	7,900	4,398	0.56	6,196	0.78
10	Garden Avenue	EB	9	8,800	4,717	0.54	6,071	0.69
10	Garden Avenue	WB	9	8,800	4,646	0.53	6,236	0.71
11	Powerline Road	NB	13	9,400	4,243	0.45	6,005	0.64
11	Powerline Road	SB	13	9,400	4,807	0.51	6,360	0.68
12	Murray Street	EB	7	4,400	2,131	0.48	1,965	0.45
12	Murray Street	WB	8	5,200	1,657	0.32	2,623	0.50
13	West External	EB	7	7,300	1,707	0.23	2,286	0.31
13	West External	WB	7	7,300	1,681	0.23	2,249	0.31
14	South-West External	NB	4	4,300	1,560	0.36	1,201	0.28
14	South-West External	SB	4	4,300	960	0.22	1,622	0.38
15	East External	EB	5	6,900	3,152	0.46	3,828	0.55
15	East External	WB	5	6,900	3,298	0.48	3,948	0.57
16	North-East External	NB	3	3,200	1,444	0.45	1,729	0.54
16	North-East External	SB	3	3,200	1,254	0.39	2,347	0.73
17	North-West External	NB	3	3,300	809	0.25	931	0.28
17	North-West External	SB	3	3,300	800	0.24	1,000	0.30

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Note: i) Screenlines are illustrated in ***Figure 2-3*** of the 2020 TMP Update.

ii) Total (capacity) = the total roadway vehicle capacity of all lanes that cross a particular screenline in a particular direction.

iii) Volume = the total number of vehicles that cross a particular screenline in a particular direction during a particular peak hour.

Additional analysis on the system behaviour was also extracted from the model. With population and employment growth, there will be an increase in demand on the road network. This means an increase in VKT, VHT, average travel time, and the percent of the network that is at or approaching capacity. The results of the system performance metrics for 2016 and 2051 'Do Minimal' road networks are summarized in ***Table 2-7***, which shows significant increases in travels times, due to the network congestion.

Table 2-7: Brantford Modeled System Performance - PM Peak Period

Network performance measure \ Year	2016	2051 (Do Minimal)
Vehicle Kilometres Travelled (VKT)	183,200	335,850
Vehicle Hours Travelled (VHT)	2,880	6,590
Average Trip Travel Time (minutes: seconds)	05:35	07:44
Percent of network approaching or over capacity	0.31%	6.44%

Note: All trips originating from or destined to Brantford

2.4.3 Transit Ridership

Overall transit person trips in Brantford are projected to grow significantly, between 2016 and 2051, as illustrated in ***Table 2-8***. This can be attributed to strong population and employment growth that is projected for Brantford over the same time period.

Table 2-8: Projected Transit Person Trip Growth, 2016 to 2051

Transit Service	AM Peak Period (6:00 – 9:00 AM)			PM Peak Period (3:00 – 6:00 PM)		
	Person Trips		Growth	Person Trips		Growth
	2016	2051		2016	2051	
Local (Brantford Transit)	1,188	1,689	42%	1,625	2,461	51%
Regional (GO Transit, VIA Rail, Greyhound, etc.)	241	257	7%	249	281	13%
Total	**1,429**	**1,946**	**36%**	**1,874**	**2,742**	**46%**

Likewise, transit ridership by route is also projected to grow significantly between 2016 and 2051, as illustrated in ***Table 2-9***. Transit route growth is directly related to the growth in population and/or employment that is planned in the immediate vicinity of the transit route. For example, significant population growth, illustrated previously in ***Figure 2-1***, is planned for the Shellard Lane area of Southwest Brantford and as a result ridership on Route 6 – West Brant/Shellard is expected to increase by 74% during the AM peak period and 100% during the PM peak period. Significant employment growth, illustrated previously in ***Figure 2-2***, is planned for the Northwest Industrial Area and as a result ridership on Route 8 – Holmedale/Mayfair is expected to increase by 75% during the AM peak period and 91% during the PM peak period.

Table 2-9: Projected Local Transit Route Ridership Growth, 2016 to 2051

Route	AM Peak Period (6:00 – 9:00 AM)			PM Peak Period (3:00 – 6:00 PM)		
	Ridership		Growth	Ridership		Growth
	2016	2051		2016	2051	
1 - Eagle Place	205	295	44%	228	374	64%
2 - West Street/Brier Park	216	273	26%	409	517	26%
4A - Mall Link	264	352	33%	372	484	30%
4C - Mall Link	217	292	34%	318	433	36%
5 - West Brant/Oakhill	84	99	18%	116	157	36%
6 - West Brant/Shellard	289	503	74%	215	429	100%
7 - East Ward/Braneida	197	212	8%	280	396	42%
8 - Holmedale/Mayfair	195	342	75%	239	456	91%
9 - Echo Place	230	302	31%	349	520	49%
Total	**1,897**	**2,670**	**41%**	**2,526**	**3,766**	**49%**

Note: i) Route ridership numbers are based on model assignments; and
ii) Total route ridership numbers exceed local transit persons trips (Table 2-10) because route ridership numbers include transfers.

Figure 2-6 and ***Figure 2-7*** illustrate the 2051 AM transit origin trips and the 2051 AM transit destination trips respectively. Collectively, these figures provide a high-level summary of where transit users are coming from and going to during the AM Peak Period.

Figure 2-6: Future (2051) Origin Transit Trips (per km^2) by TAZ – AM Peak Period

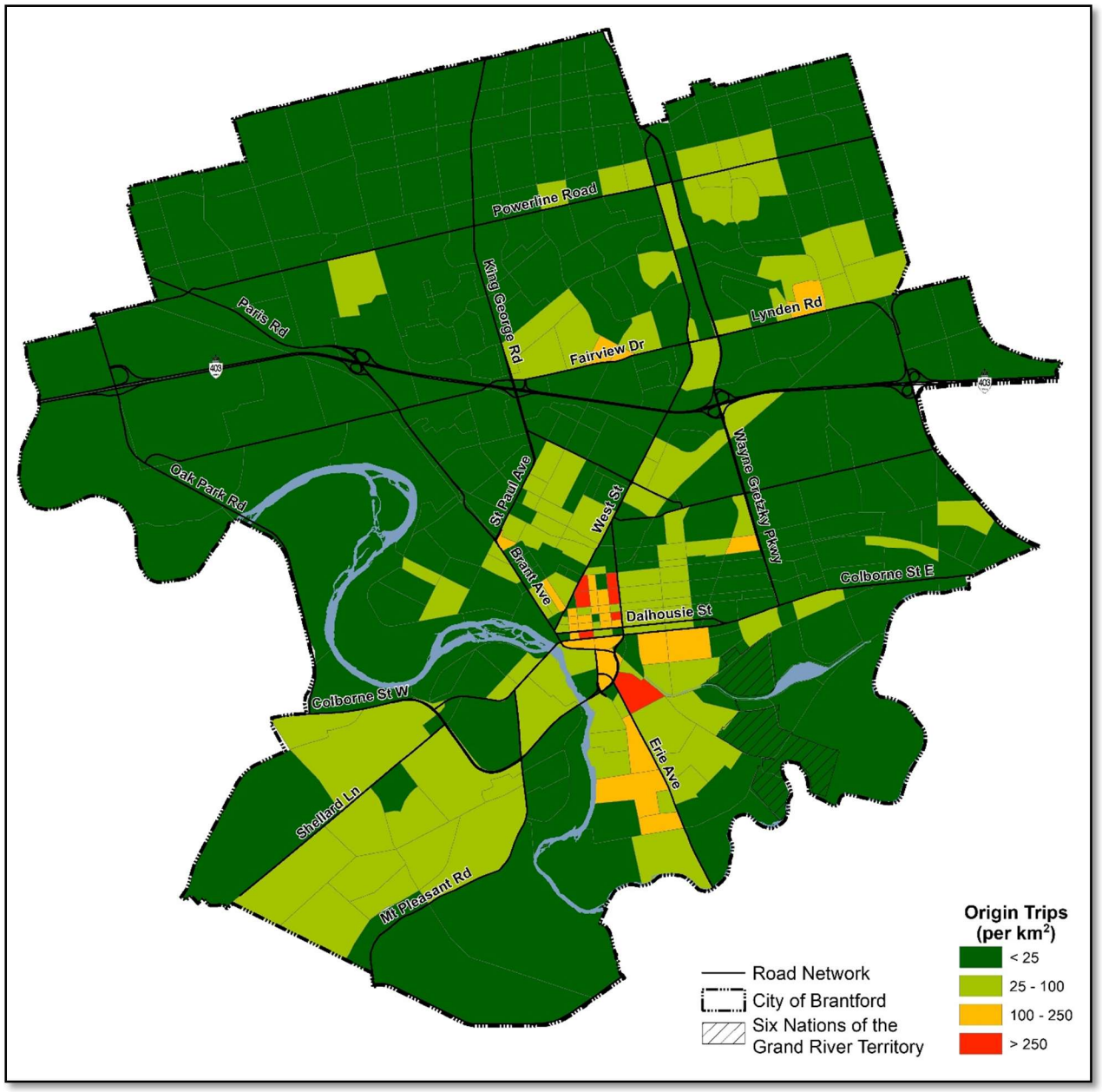
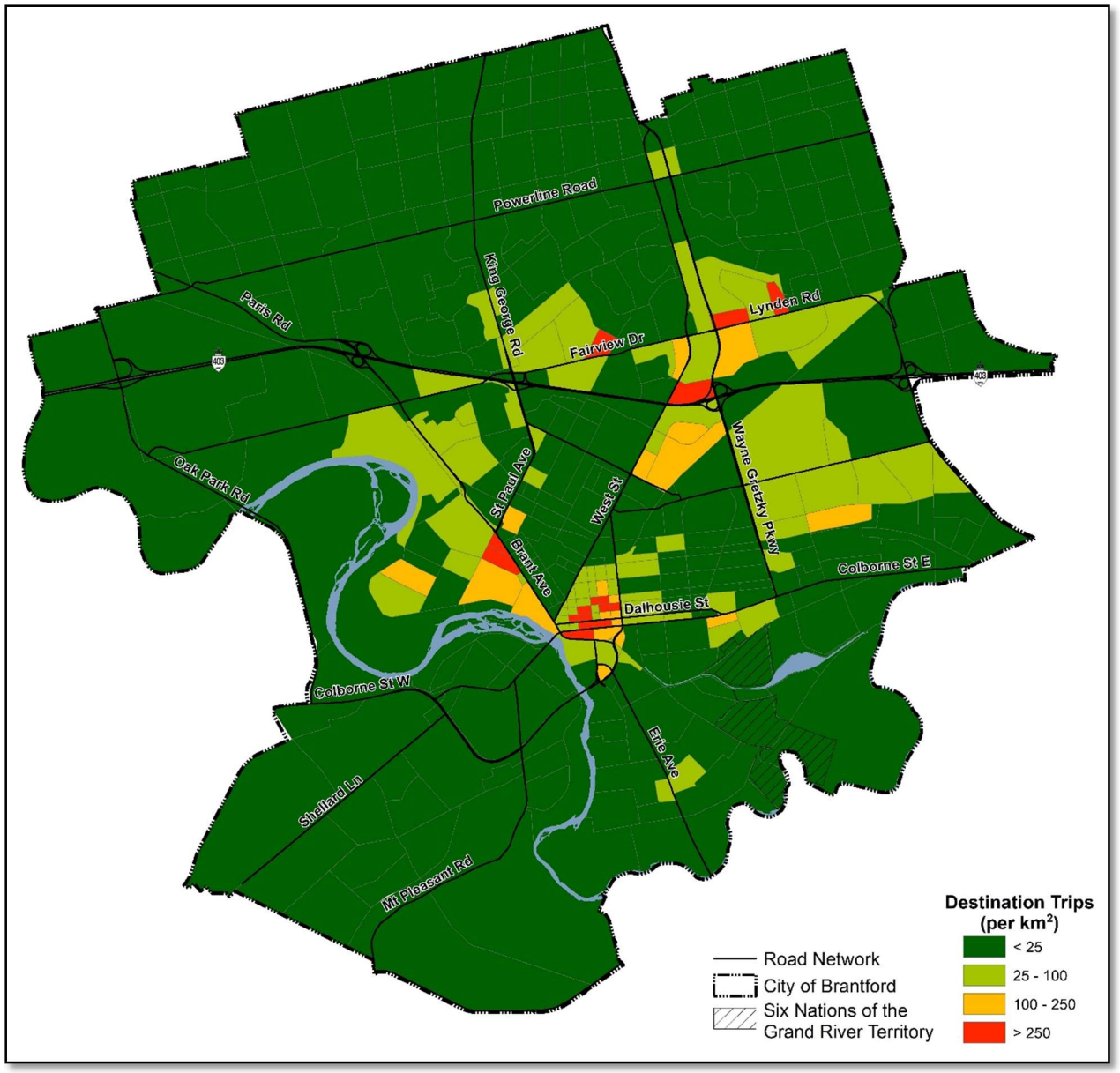


Figure 2-7: Future (2051) Destination Transit Trips (per km^2) by TAZ – AM Peak Period



3.0 Complete Streets Framework

3.1 Introduction

Introduction remains as documented in the 2020 TMP Update.

3.1.1 Objective

Objective remains as documented in the 2020 TMP Update.

3.1.2 Complete Streets

Complete Streets remains as documented in the 2020 TMP Update.

3.2 Existing Policies and Plans

Existing Policies and Plans remains as documented in the 2020 TMP Update.

3.2.1 Draft Official Plan (2020)

Draft Official Plan remains as documented in the 2020 TMP Update.

3.2.2 Transportation Master Plan (2014)

Transportation Master Plan (2014) remains as documented in the 2020 TMP Update.

3.2.3 Linear Municipal Infrastructure Standards

Linear Municipal Infrastructure Standards remains as documented in the 2020 TMP Update.

3.3 Network Philosophy

Network Philosophy remains as documented in the 2020 TMP Update.

3.4 Network Elements

Network Elements remains as documented in the 2020 TMP Update.

3.4.1 Walking

3.4.1.1 Sidewalks

Sidewalks remains as documented in the 2020 TMP Update.

3.4.1.2 Multi-Use Paths

Multi-Use Paths remains as documented in the 2020 TMP Update.

3.4.1.3 Trails

Trails remains as documented in the 2020 TMP Update.

3.4.1.4 Crossings

Crossings remains as documented in the 2020 TMP Update.

3.4.2 Cycling

Cycling remains as documented in the 2020 TMP Update.

3.4.2.1 Signed Bike Route

A signed bike route remains as documented in the 2020 TMP Update

3.4.2.2 Bicycle Priority Street

Bicycle Priority Street remains as documented in the 2020 TMP Update.

3.4.2.3 Paved Shoulders

Paved Shoulders remains as documented in the 2020 TMP Update.

3.4.2.4 Bike Lanes

Bike Lanes remains as documented in the 2020 TMP Update.

3.4.2.5 Buffered Bike Lanes

Buffered Bike Lanes remains as documented in the 2020 TMP Update.

3.4.2.6 Cycle Tracks

Cycle Tracks remains as documented in the 2020 TMP Update.

3.4.2.7 Crossrides

Crossrides remains as documented in the 2020 TMP Update.

3.4.3 Transit

Transit service remains as documented in the 2020 TMP Update.

3.4.3.1 Streets

Streets remains as documented in the 2020 TMP Update.

3.4.3.2 Terminals

Terminals remains as documented in the 2020 TMP Update.

3.4.3.3 Stops

Transit stops remains as documented in the 2020 TMP Update.

3.4.4 Goods Movement

3.4.4.1 Truck Routes

Truck Routes remains as documented in the 2020 TMP Update.

3.4.5 Automobiles

3.4.5.1 Streets

Streets remains as documented in the 2020 TMP Update.

3.4.5.2 Intersections

An intersection is an at-grade junction where two or more streets meet. These locations have significant potential for conflicts (vehicle-vehicle and or vehicle-bike/pedestrian movements) and delay (reduction in the capacity of a road segment due to these conflicts). To manage these issues, where warranted by volume and safety considerations, traffic control measure are implemented to designate priority to specific movements.

Based on the concept of volumes and priorities, intersections can be divided into traffic control categories according to whether they are uncontrolled, stop/yield control (unsignalized, simple priority), signal control (time sharing), roundabout (space sharing), or grade separated (interchanges, with or without signal control). ***Figure 3-1*** shows an example of a roundabout.

Figure 3-1: Roundabout - Wilson Street and Shaver Road in Ancaster, ON

Image Credit: Google Maps

The Roads and Transportation, Design and Construction Manual, Linear Municipal Infrastructure Standards (4-May-2020), provides the general requirements and assessment tools to be used in the assessment of the most appropriate traffic control to be implemented.

Over the course of the last three to four years, a specific vision for intersections has been developed which promotes the application of roundabouts as the preferred method of traffic, where volumes, types of activity, land availability, and cost permit. Specifically, on March 21, 2017 Council directed through a Resolution, for:

- Staff to INVESTIGATE and report back to Council with a process to develop a policy, standards and appropriate traffic control/parking by-law amendments to support the implementation of modern roundabouts in the City of Brantford, considering the policies in adjacent communities, such as the Region of Waterloo; and
- Staff to DEVELOP these policies and report back to Council with candidate locations for roundabouts in the community where a feasibility study can be implemented in conjunction with approved road construction projects in the City's ten-year capital forecast.

Further to this Council Resolution, staff investigated and developed policy positions toolkits for calming and roundabout implementation, as is documented in the following staff reports:

- April 16, 2019 (Report No. 2019-164), Roundabout Installation Policy Development;
- October 8, 2019 (Report No. 2019-377), Roundabout Installation Policy Development Update; and
- March 2, 2020 Vision Zero Road Safety Committee – Traffic Calming Update [Financial Impact – None], 2020-159 and Traffic Calming Policy – Amendment [Financial Impact – None], 2020-160.

The culmination of these investigations was Policy Number: Public Works-021, Roundabout Installation Policy. To summarize:

- Policy Statement: To provide a guideline for the City of Brantford to determine if a roundabout is the appropriate intersection control for arterial or collector roadways in new subdivisions, and provide for a standardized procedure for the planning, design and implementation of such.
- Objective: Roundabouts should be considered the default intersection control for new developments unless all way stop or signal control is proven to be a superior choice, particularly at two-lane road intersections. As such, the goal of this policy is to develop a set of procedures to screen and assess whether subject intersections should be roundabout controlled: define a roundabout and its core elements, in comparison to other types of circular intersections; discuss principles of considerations (advantages vs. disadvantages); lay out the initiation, planning (screening and assessment phases), review and approval process.

This procedural and analysis tool kit to achieve this objective relative to intersection control has now been incorporated into the Linear Design Manual and the City's Roundabout Installation Guidelines.

3.5 Network Planning Guidelines

Network Planning Guidelines remains as documented in the 2020 TMP Update.

3.5.1 Principles

Principles remains as documented in the 2020 TMP Update.

3.5.2 Guidelines

Guidelines remains as documented in the 2020 TMP Update.

3.5.3 Performance Measures

3.5.3.1 Completeness

Completeness remains as documented in the 2020 TMP Update.

3.5.4 Street Types

Street Types remains as documented in the 2020 TMP Update.

3.5.4.1 Walking

Walking remains as documented in the 2020 TMP Update.

3.5.4.2 Cycling

Cycling remains as documented in the 2020 TMP Update.

3.5.4.3 Transit

Transit remains as documented in the 2020 TMP Update.

3.5.4.4 Goods Movement

Goods Movements remains as documented in the 2020 TMP Update.

3.5.4.5 Automobiles

Automobiles remains as documented in the 2020 TMP Update.

3.6 Network Assessment

Network Assessment remains as documented in the 2020 TMP Update.

3.6.1 Walking

Walking remains as documented in the 2020 TMP Update.

3.6.2 Cycling

Cycling remains as documented in the 2020 TMP Update.

3.6.3 Transit

Transit remains as documented in the 2020 TMP Update.

3.6.4 Goods and Services Movement

Goods and Services remains as documented in the 2020 TMP Update.

3.6.5 Road Network

Road Network remains as documented in the 2020 TMP Update.

4.0 Transportation Assessment

This chapter describes the process of assessing the future 2051 travel conditions, evaluating alternative strategies for addressing identified issue, and selecting a strategic recommended plan for transportation planning in Brantford to 2051. The assessment builds on the data and analysis approach identified in the ***Study Foundation*** (Chapter 1) and ***Complete Streets Framework*** (Chapter 3).

The performance of the transportation system was assessed using the City's strategic travel demand forecasting model. This model accounts for land-use (at a traffic zone level of detail, as provided by the Municipal Comprehensive review process) trip generation, trip distribution, and mode split in assigning travel demands to the transportation network. The assigned vehicle volumes are then compared to the capacity of the infrastructure at a corridor and roadway link level (i.e. volume to capacity assessment). This analysis tool also allows for the detailed evaluation of the origins and destinations for trips using specific infrastructure.

Travel demands were then used to identify the impacts of the alternative strategies on the corridor performance and assist in the identification of the impact of alternatives considered to address the identified roadway constraint.

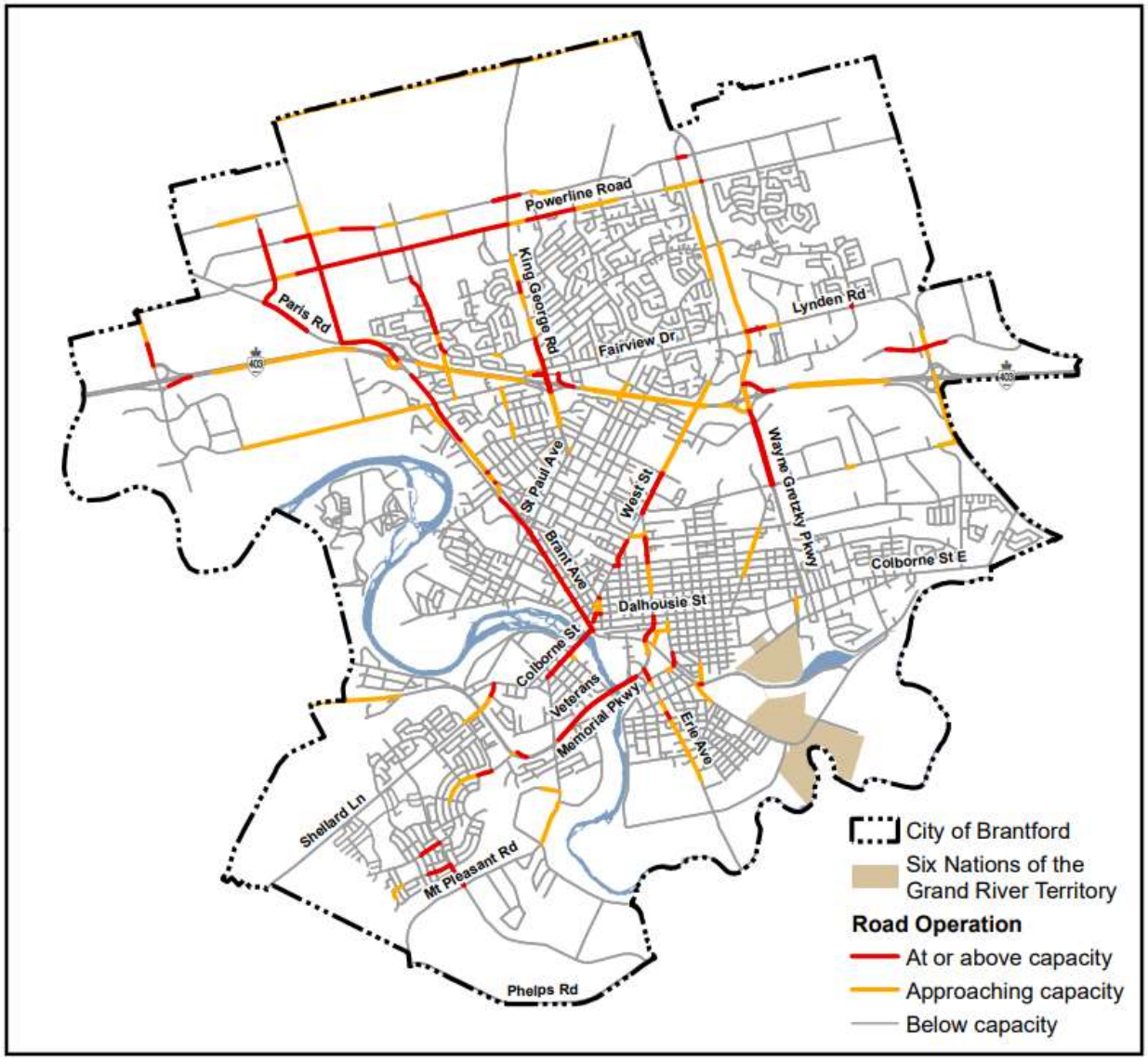
It is important to understand that infrastructure and service provisions in one corridor can have impacts, positive and negative, in other corridors. Problems identified and solutions assessed during the transportation analysis are mindful of this interdependency between corridors.

The resulting recommended plan includes a combination of: optimising existing transportation infrastructure, adding additional transportation infrastructure, and managing travel demand.

4.1 Do Minimal

The capacity constraints by 2051, accounting for proposed growth under a transportation network scenario with minimal improvements over today's condition, were identified. The changes to the road network include only short term committed projects (e.g. The Oak Park Road/Highway 403 interchange upgrade), collector roads required to support the expansion growth areas (required to provide access to future development), and the potential closure of Tutela Heights Road in the vicinity of Davern Road (as a result of the Tutela Heights Slope Stability EA). An overview of the link and screenline capacity and performance in the PM peak hour for the 2051 Do Minimal network are illustrated ***Figure 4-1*** and ***Table 4-1*** respectively.

Figure 4-1: 2051 Do Minimal Network: Capacity Constraints



Overall, the 2051 Do Minimal network assessment shows that many of the arterial roads will be operating at or above capacity in the PM peak hour. Growth in travel has resulted in a significant decrease in network performance. Existing issues crossing Highway 403 and the Grand River are exacerbated by growth, and new issues have emerged (as a result of boundary expansion) along the north-south roadways connecting the downtown and growth areas to Highway 403.

Table 4-1: 2051 Do Minimal: Screenline Assessment

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	7	8,100	6,752	0.83	6,199	0.77
1	Grand River South	WB	7	8,100	4,433	0.55	7,639	0.94
2	Grand River North	EB	4	5,200	3,176	0.61	4,185	0.80
2	Grand River North	WB	5	6,000	2,779	0.46	3,918	0.65
3	Highway 403	NB	13	10,800	7,023	0.65	9,262	0.86
3	Highway 403	SB	13	10,800	7,463	0.69	9,431	0.87
4	King George Road	EB	11	9,600	5,254	0.55	8,699	0.91
4	King George Road	WB	11	9,600	6,998	0.73	7,417	0.77
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,518	0.59	6,592	0.87
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,604	0.74	5,969	0.79
6	Wayne Gretzky Parkway (South)	EB	7	4,900	1,950	0.40	2,336	0.48
6	Wayne Gretzky Parkway (South)	WB	7	4,900	1,621	0.33	2,802	0.57
7	Memorial Drive	EB	9	6,100	1,670	0.27	3,158	0.52
7	Memorial Drive	WB	9	6,100	2,434	0.40	2,690	0.44
8	West Street	EB	6	4,300	2,165	0.50	3,109	0.72
8	West Street	WB	6	4,300	2,661	0.62	3,076	0.72
9	CNR Corridor	NB	11	7,900	4,413	0.56	5,190	0.66
9	CNR Corridor	SB	11	7,900	4,398	0.56	6,196	0.78
10	Garden Avenue	EB	9	8,800	4,717	0.54	6,071	0.69
10	Garden Avenue	WB	9	8,800	4,646	0.53	6,236	0.71
11	Powerline Road	NB	13	9,400	4,243	0.45	6,005	0.64
11	Powerline Road	SB	13	9,400	4,807	0.51	6,360	0.68
12	Murray Street	EB	7	4,400	2,131	0.48	1,965	0.45
12	Murray Street	WB	8	5,200	1,657	0.32	2,623	0.50
13	West External	EB	7	7,300	1,707	0.23	2,286	0.31
13	West External	WB	7	7,300	1,681	0.23	2,249	0.31
14	South-West External	NB	4	4,300	1,560	0.36	1,201	0.28
14	South-West External	SB	4	4,300	960	0.22	1,622	0.38
15	East External	EB	5	6,900	3,152	0.46	3,828	0.55
15	East External	WB	5	6,900	3,298	0.48	3,948	0.57
16	North-East External	NB	3	3,200	1,444	0.45	1,729	0.54
16	North-East External	SB	3	3,200	1,254	0.39	2,347	0.73
17	North-West External	NB	3	3,300	809	0.25	931	0.28
17	North-West External	SB	3	3,300	800	0.24	1,000	0.30

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Notes: i) For more details on sreeenlines in general please see ***Chapter 2.0.Transportation Impacts of Growth*** in the 2020 TMP Update.

ii) Screenlines are illustrated in ***Figure 2-3*** of the 2020 TMP Update.*Error! Reference source not found.*

iii) Total (capacity) = the total roadway vehicle capacity of all lanes that cross a particular screenline in a particular direction.

iv) Volume = the total number of vehicles that cross a particular screenline in a particular direction during a particular peak hour.

The following critical deficiencies were identified in the road network for the PM peak hour:

- Inter-regional (significant number of trips in the corridor are to/from areas outside of Brantford)
  - Brant Avenue - St Paul Avenue to Colborne Street
  - Wayne Gretzky Parkway - Henry Street to Highway 403
  - Wayne Gretzky Parkway - North of Highway 403
  - King George Road - Crossing Highway 403
  - Oak Park Road – Crossing Highway 403
  - Paris Road - Highway 403 to Powerline Road
- Intra-regional (significant number of trips in the corridor are to/from areas within Brantford)
  - Lorne Bridge (Colborne Street) - Grand River Crossing
  - West Street - Charing Cross Street to Henry Street
  - Veterans Memorial Parkway - Mt. Pleasant Street to Market Street
  - Paris Road - South of Highway 403
  - Powerline Road - Paris Road to Wayne Gretzky Parkway
  - Hardy Road - Ferrero Boulevard to Paris Road
  - Erie Avenue - Veterans Memorial Parkway to Birkett Lane
- Local System (trips primarily local in nature)
  - Clarence Street/Clarence Street South – Dalhousie Street to Icomm Drive
  - Colborne Street West – County Road 7 (Pleasant Ridge Road) to D'Aubigny Road
  - Mohawk Street/Greenwich Street/Murray Street

4.2 Alternative Transportation Strategies

Alternative Strategies remains as documented in the 2020 TMP Update.

4.2.1 Travel Demand Management

Travel Demand Management (TDM) is a wide range of policies, programs, services and products that influence how, why, when, and where people travel to create a more sustainable transportation network. The objectives are to encourage individuals to:

- utilize alternate modes of transportation (walk, cycle, take transit or carpool instead of driving alone);
- travel less (telework, link several purposes in one trip); or
- change trip times or routes (choose off-peak hours or less congested roads).

Ultimately, a TDM strategy focuses on the modification of travel behaviour by encouraging people to use sustainable modes of transportation, rather than driving alone, or making fewer trips by car. For example: increased use of transit, increased cycling and walking for shorter distance trips, and taking advantage of ride sharing opportunities would address the growth of traffic in the City by achieving new mode share targets in 2051 (as illustrated in ***Table 4-2***). They include a reduction in the auto driver/passenger mode share from 85% in 2016 to 80% in 2051, a significant increase in the transit

mode share from 2.8% today to 5.8% in 2051 and an increase in the Active Transportation mode share from 7.8% today to 9.9% in 2051.

Table 4-2: Brantford Travel Mode Share Targets: Internal Trips (Brantford to Brantford)

Mode \ Year	2016	2051	Difference
Auto Driver	70.8%	67.5%	- 3.3%
Auto Passenger	14.6%	12.5%	- 2.1%
Transit	2.8%	5.8%	+ 3.0%
Cycle/walk	7.8%	9.9%	+ 2.1%
Other	4.0%	4.3%	+ 0.3%
	100.0%	**100.0%**	**0.0%**

This TDM strategy does not include any increases to the roadway network capacity that would be provided by roadway widening, extensions and/or additions. However, improvements (expansion, higher frequency) to the transit system would be required to facilitate the penetration of new or underserved markets in the City.

Travel Demand Management initiatives do not completely replace the need for road improvements or system expansion. They are, however, effective in deferring costly infrastructure improvements or expansion. In deferring the need for infrastructure improvements and supporting alternative modes of travel, TDM provides for health and environmental benefits, consistent to OP goals.

Active Transportation

Active Transportation remains as documented in the 2020 TMP Update.

Transit

Travel Demand Management relies heavily on the use of transit. While the use of transit is growing, today approximately 3% of weekday peak hour trips are made by transit. The success of transit depends on the availability, convenience and reliability of service, and the proximity of that service to residences, jobs, and schools. The greater the access to transit for people and jobs, the higher the potential for transit ridership.

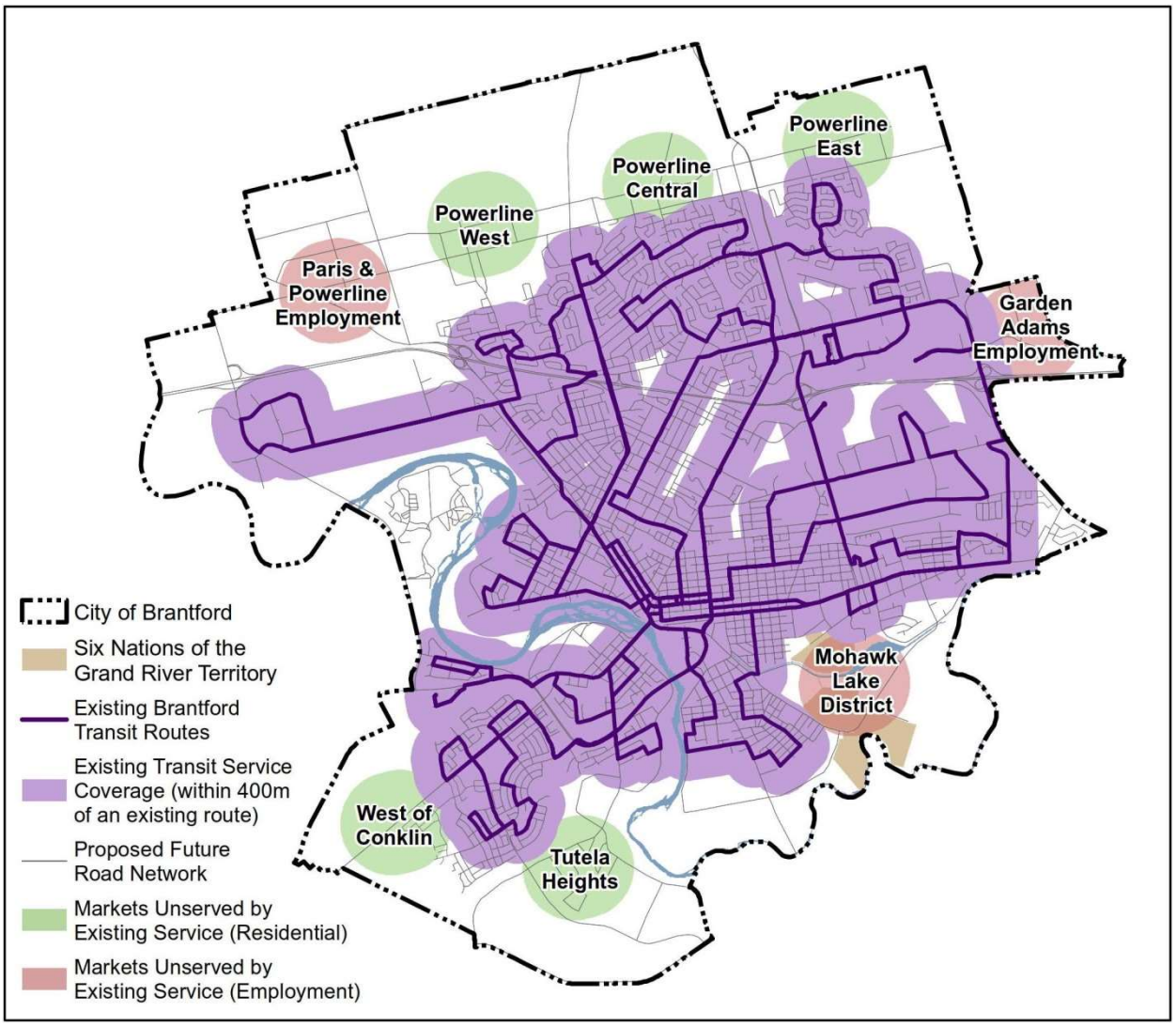
The approach to determining the future potential for transit in Brantford was as follows:

- Assess existing transit system coverage;
- Review existing mode splits to transit for traffic zones;
- Set appropriate targets for land use type and density, and in consideration of available transit;
- Apply targets to 2051 trip ends;
- Adjust total travel demands for vehicles;
- Assign transit trips to enhanced/expanded transit service coverage; and
- Outcome:

- Overall system improvement in transit use results in reduction of vehicle trips;
- Corridor transit use increase;
- Increase in transit use, decreases auto trips; and
- Capacity analysis reassessed using reduced auto demand scenario (TDM).

Achieving these increases requires significant expansion of existing service (new routes) and service frequency (more buses, smaller headways between buses) to serve existing areas more efficiently and to provide service in new areas. ***Figure 4-2*** identifies the existing transit system coverage and future market opportunities.

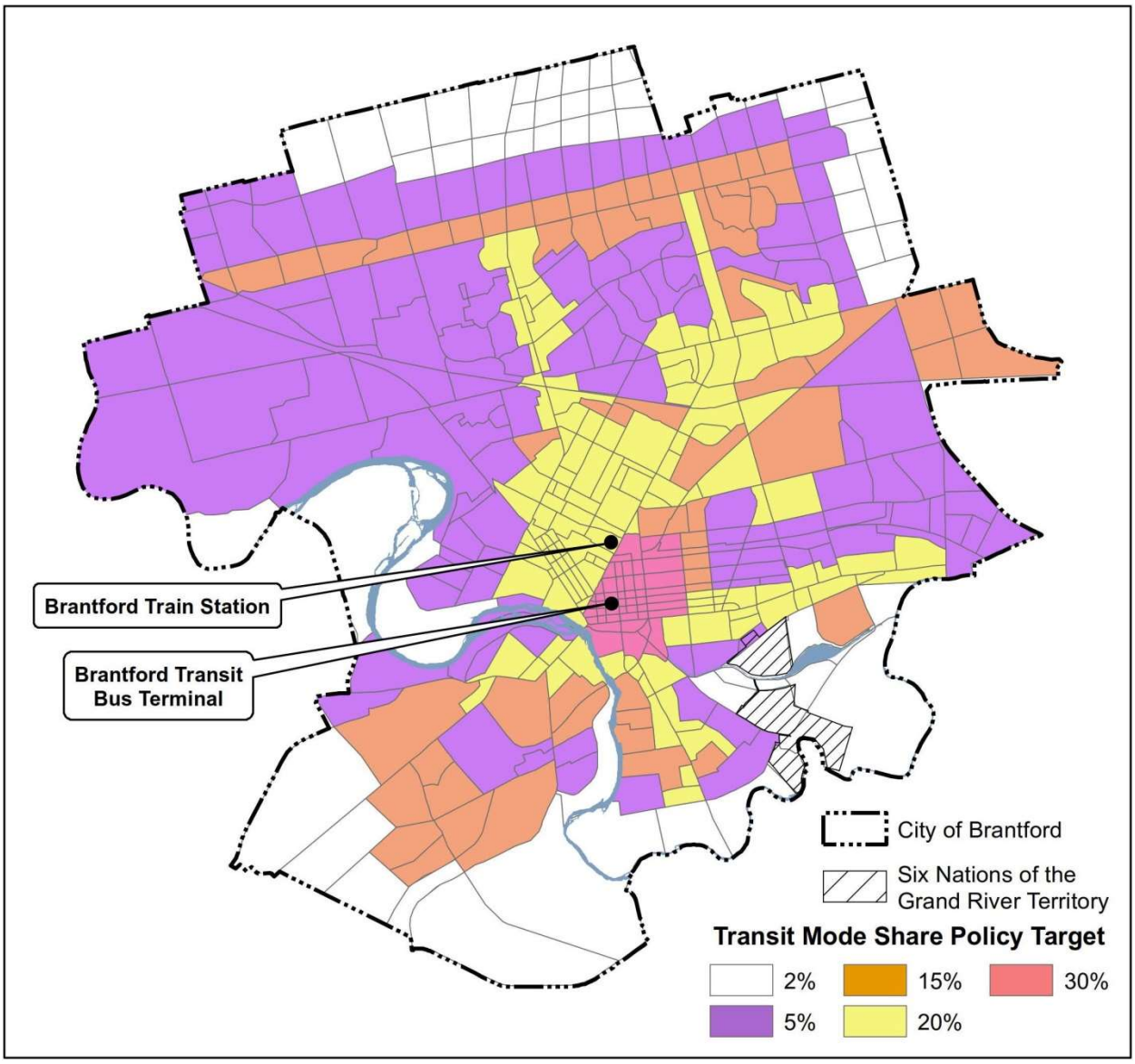
Figure 4-2: Existing Transit System Coverage and Future Market Opportunities



A review of existing mode splits was undertaken to establish the penetration of the transit market. Population and employment densities in the 2051 condition were reviewed to identify areas where

transit service would have the most impact. New mode share targets were identified and applied to future trip generation to establish new transit ridership levels and make corresponding adjustments to the auto trip making. ***Figure 4-3*** identifies the 2051 mode split targets for transit.

Figure 4-3: 2051 Transit Mode Split – Zone Policy Targets

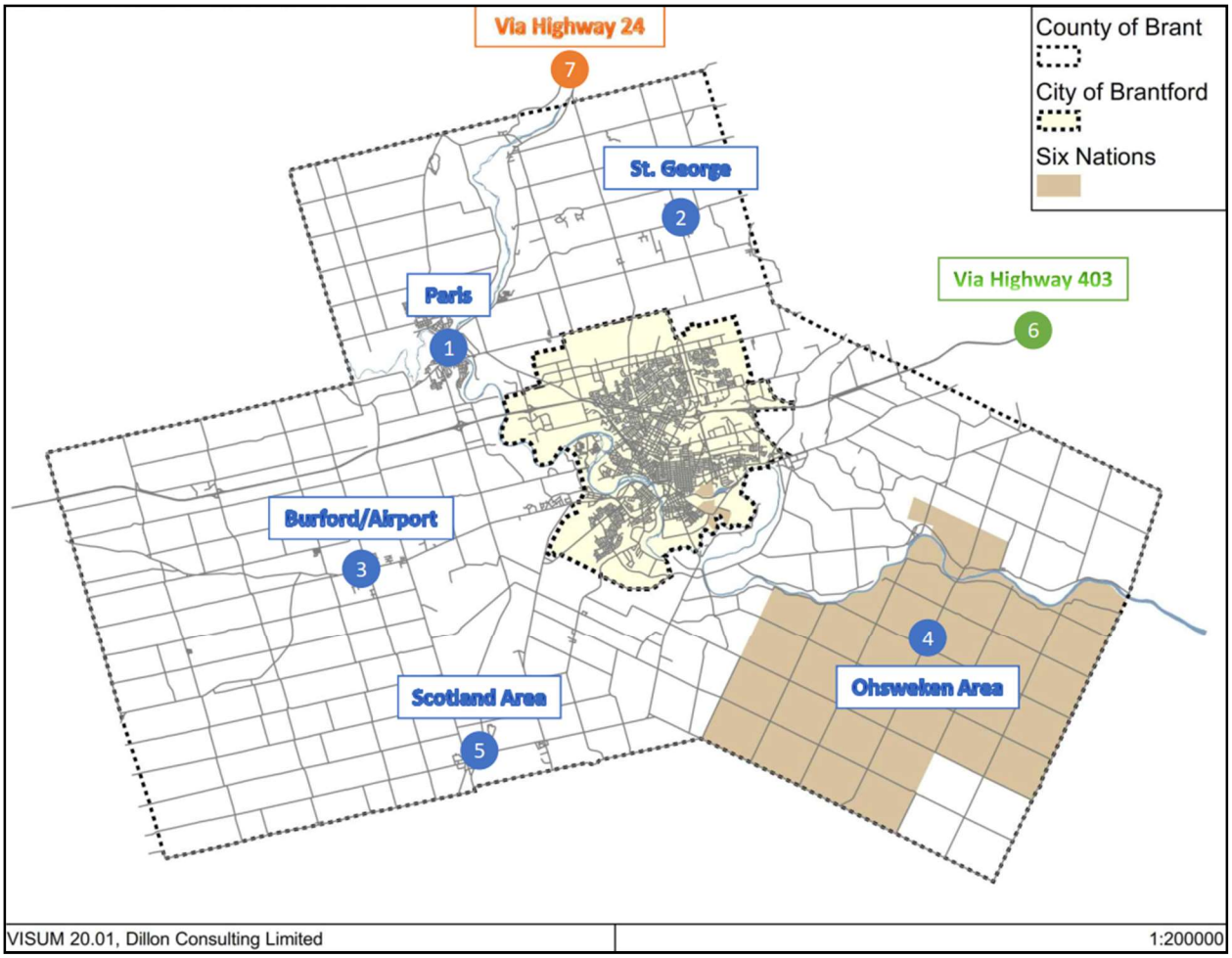


The application of the new transit mode share targets results in a significant increase in transit ridership. Overall, the city-wide transit mode share is forecast to increase from 2.8% in 2016 to 5.8% in 2051. This mode share target is aggressive (more than double the current share) but achievable if married to land use intensification strategies identified in the OP and if a commitment is made to transit service improvements and expansion as identified in the City's 2016 transit service plan.

The impact of this increased focus on transit is a tripling of route ridership (remembering that route ridership includes transfers between multiple routes by a single rider to facilitate their trip). Such a service expansion will require significant investment in capital and operating costs. The current transit system comprises approximately 175 km of linear routes, which would need to expand to over 220 km of linear routes to access the growth areas. This reflects a 25% increase in transit coverage in the City that will also require additional vehicle hours to maintain the required service levels to meet demand.

In addition to the local Brantford to Brantford transit service, there are opportunities to partner with other agencies to connect communities outside the City limits by public transit. While there is some existing regional transit via GO Transit to Hamilton, McMaster University, and Aldershot GO Station (Burlington), these markets are under served, and the County connections are very limited. Providing more consistent transit connectivity will reduce the vehicle travel demands resulting in benefits to the City's road system performance. Travel markets to/from Brant County, the GTA, and the Tri-Cities (Cambridge/Kitchener/Waterloo) are significant. They are displayed in ***Figure 4-4*.**

Figure 4-4: Inter-Regional Transit Opportunities



A review of the forecasted 2051 PM peak period person trips identified the following market potentials:

- From Brantford to Brant:
  - (1) Paris - 6,700 person trips (all modes)
  - (2) St. George - 1,250 person trips (all modes)
  - (3) Burford/Airport - 250 person trips (all modes)
  - (4) Ohsweken area - 250 person trips (all modes)
  - (5) Scotland area - 900 person trips (all modes)
- From Brantford to GTA:
  - (6) Via Hwy 403 - 7,700 person trips (all modes)
- From Brantford to Cambridge/Kitchener/Waterloo
  - (7) Via Hwy 24 - 2,250 person trips (all modes)

Not all of these trips are divertible to transit, but even achieving 2%-5% market penetration could result in significant auto trip reduction on critical roadways. This inter-regional potential would also be beneficial to captive ridership (i.e. seniors, students, and mobility challenged users).

The development of such service has the potential to reduce auto volumes on the critical north-south arterials within the City but will require inter-agency collaboration (at both ends of trip) to implement (e.g. planning and funding).

Manage Travel Demand Assessment

The effect of the 5.8% transit mode share, in combination with a 9.9% mode share to active modes (walking and cycling) significantly reduces the 2051 vehicle demand on the network. This TDM scenario, as assigned to the Do Minimal network, results in a noticeable improvement in network operations across the city compared with the 2051 Do Minimal forecasts. ***Figure 4-5*** illustrates an overview of the link capacity constraints in the 2051 TDM network, while ***Table 4-3*** displays the screenline capacity results in the 2051 TDM network.

The TDM network is forecast to work much more reliably in the downtown area and crossing Highway 403. However, specific problem areas still remain: Paris Road between Highway 403 and Golf Road, King George Road crossing Highway 403, and the Grand River Crossings.

A TDM strategy alone does not address all of the transportation network system constraints. Transportation issues remain in the north along Powerline Road and on the two Grand River vehicle bridge crossings (Lorne Bridge [Colborne Street] and Veterans Memorial Parkway).

Figure 4-5: 2051 Manage Travel Demand Network: Capacity Constraints

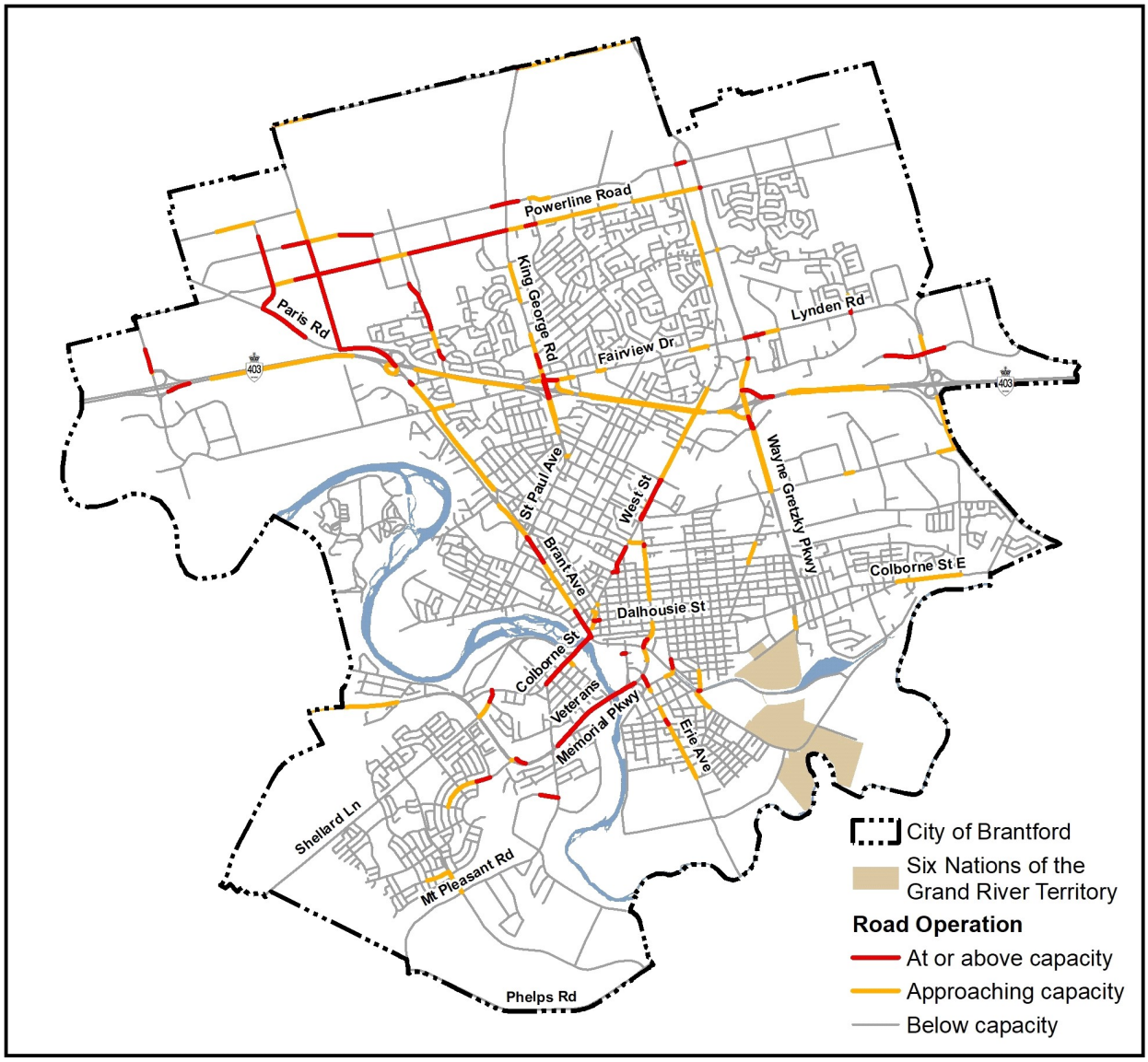


Table 4-3: 2051 Manage Travel Demand: Screenline Assessment

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	7	8,100	6,509	0.80	5,926	0.73
1	Grand River South	WB	7	8,100	4,145	0.51	7,179	0.89
2	Grand River North	EB	4	5,200	3,012	0.58	4,039	0.78
2	Grand River North	WB	5	6,000	2,586	0.43	3,697	0.62
3	Highway 403	NB	13	10,800	6,521	0.60	8,655	0.80
3	Highway 403	SB	13	10,800	7,141	0.66	8,912	0.83
4	King George Road	EB	11	9,600	5,030	0.52	8,319	0.87
4	King George Road	WB	11	9,600	6,599	0.69	6,890	0.72
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,379	0.58	6,331	0.83
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,464	0.72	5,774	0.76
6	Wayne Gretzky Parkway (South)	EB	6	4,100	1,854	0.45	2,154	0.53
6	Wayne Gretzky Parkway (South)	WB	6	4,100	1,468	0.36	2,664	0.65
7	Memorial Drive	EB	7	4,900	1,573	0.32	2,898	0.59
7	Memorial Drive	WB	7	4,900	2,269	0.46	2,398	0.49
8	West Street	EB	6	4,300	2,010	0.47	3,027	0.70
8	West Street	WB	6	4,300	2,581	0.60	3,054	0.71
9	CNR Corridor	NB	11	7,900	4,115	0.52	4,873	0.62
9	CNR Corridor	SB	11	7,900	4,093	0.52	5,895	0.75
10	Garden Avenue	EB	8	8,000	4,593	0.57	5,781	0.72
10	Garden Avenue	WB	8	8,000	4,574	0.57	6,013	0.75
11	Powerline Road	NB	12	9,000	4,008	0.45	5,741	0.64
11	Powerline Road	SB	12	9,000	4,617	0.51	5,978	0.66
12	Murray Street	EB	7	4,400	2,095	0.48	1,846	0.42
12	Murray Street	WB	8	5,200	1,570	0.30	2,497	0.48
13	West External	EB	7	7,300	1,667	0.23	2,259	0.31
13	West External	WB	7	7,300	1,615	0.22	2,179	0.30
14	South-West External	NB	4	4,300	1,546	0.36	1,186	0.28
14	South-West External	SB	4	4,300	942	0.22	1,644	0.38
15	East External	EB	5	6,900	3,162	0.46	3,825	0.55
15	East External	WB	5	6,900	3,304	0.48	3,960	0.57
16	North-East External	NB	3	3,200	1,430	0.45	1,712	0.54
16	North-East External	SB	3	3,200	1,245	0.39	2,325	0.73
17	North-West External	NB	3	3,300	774	0.23	920	0.28
17	North-West External	SB	3	3,300	796	0.24	955	0.29

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Notes: i) For more details on sreeenlines in general please see ***Chapter 2.0.Transportation Impacts of Growth*** in the 2020 TMP Update.

ii) Screenlines are illustrated in ***Figure 2-3*** of the 2020 TMP Update.

iii) Total (capacity) = the total roadway vehicle capacity of all lanes that cross a particular screenline in a particular direction.

iv) Volume = the total number of vehicles that cross a particular screenline in a particular direction during a particular peak hour.

4.2.2 Transportation System Management

A Transportation Systems Management (TSM) remains as documented in the 2020 TMP Update.

4.2.3 Increase Infrastructure

The Increase Infrastructure strategy addresses travel demands on the City's road network by enhancing the carrying capacity of the network through strategic road widenings and extensions. The main impact of this strategy is the ability to maintain an acceptable and efficient Level-of-Service on Brantford roads over the next 20 years. ***Figure 4-6*** illustrates an overview of the link performance with respect to capacity in the 2051 Increased Infrastructure network, while ***Table 4-4*** displays the screenline demand to capacity results in the 2051 Increased Infrastructure network. The Increase Infrastructure strategy includes short-term committed improvements, as well as a full program of infrastructure projects as was identified in the 2014 Transportation Master Plan (excluding a Veteran's Memorial Parkway extension, due to recent Council Resolution regarding use of lands under the jurisdiction of Six Nations of the Grand River (i.e. Glebe Farm Lands) for a transportation corridor).

The increased infrastructure network will operate significantly better than the 2051 Do Minimal network in the following ways:

- Reducing congestion along Hardy Road and Brant Avenue as a result of the Oak Park Road extension; and
- Eliminating congestion on Wayne Gretzky Parkway as a result of a widening to six lanes.

However, the two main crossings of the Grand River are still anticipated to be significantly over capacity even with the addition of the Oak Park Road Grand River crossing (4 lanes) and a widening of the Veteran's Memorial Parkway Grand River crossing (2 to 4 lanes).

It is noted that improvements to the network required to support development in the expansion areas have not been specifically identified as strategic network needs, as they are driven by local development needs.

In short, the network will still experience some residual capacity issues under the 2051 growth scenario even with significant investment in infrastructure improvements (as recommended in the 2014 TMP).

Figure 4-6: 2051 Increased Infrastructure Network: Capacity Constraints

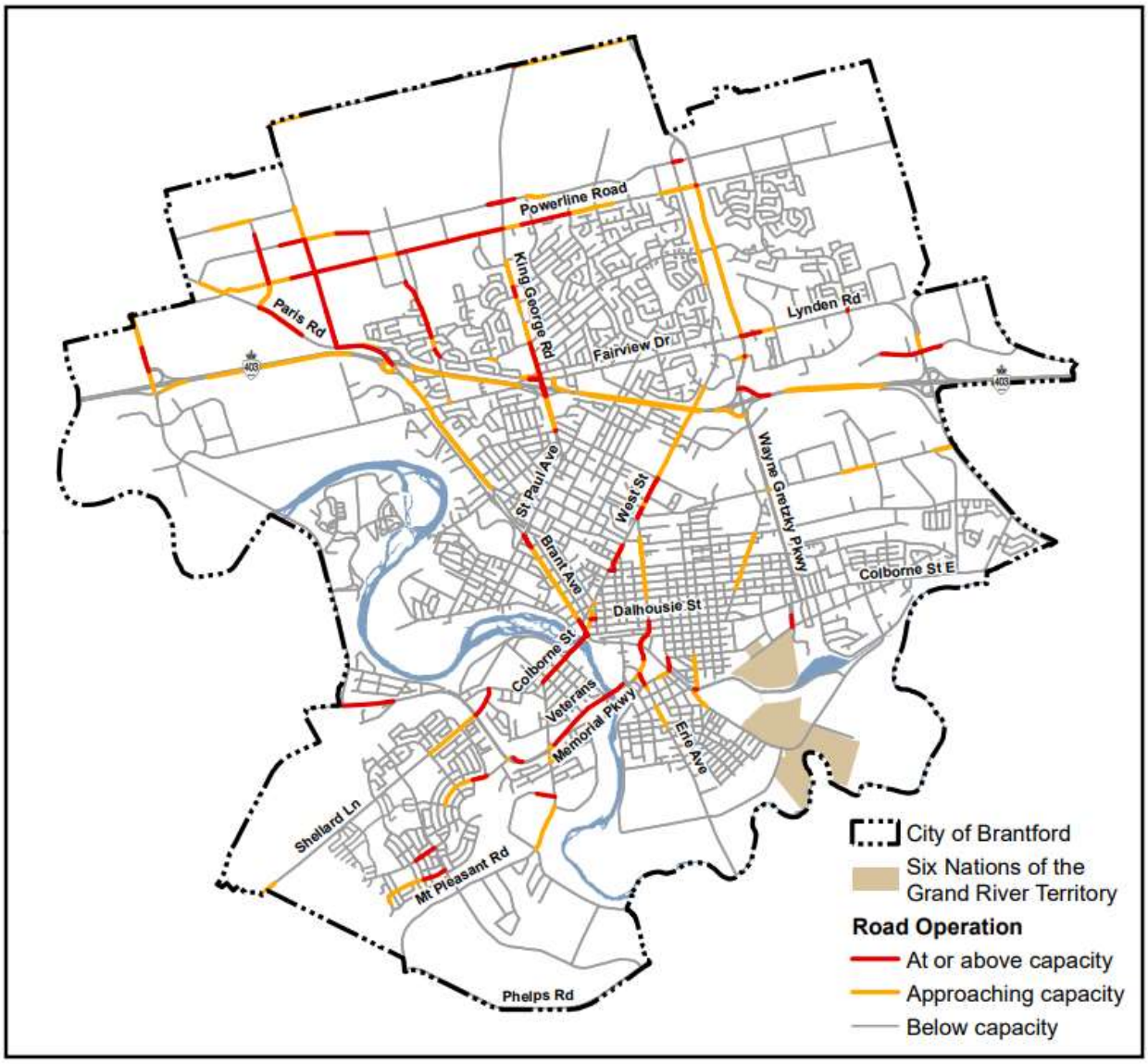


Table 4-4: 2051 Increase Infrastructure: Screenline Assessment

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	10	11,100	6,423	0.58	7,305	0.66
1	Grand River South	WB	10	11,100	5,552	0.50	7,559	0.68
2	Grand River North	EB	4	5,200	2,933	0.56	4,290	0.83
2	Grand River North	WB	5	6,000	2,845	0.47	3,729	0.62
3	Highway 403	NB	14	11,800	7,351	0.62	9,334	0.79
3	Highway 403	SB	14	11,800	7,447	0.63	9,902	0.84
4	King George Road	EB	11	9,600	5,225	0.54	8,328	0.87
4	King George Road	WB	11	9,600	6,619	0.69	7,307	0.76
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,621	0.61	6,653	0.88
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,619	0.74	6,079	0.80
6	Wayne Gretzky Parkway (South)	EB	7	4,900	1,975	0.40	2,370	0.48
6	Wayne Gretzky Parkway (South)	WB	7	4,900	1,635	0.33	2,947	0.60
7	Memorial Drive	EB	9	6,100	1,684	0.28	3,110	0.51
7	Memorial Drive	WB	9	6,100	2,375	0.39	2,614	0.43
8	West Street	EB	6	4,300	2,130	0.50	3,111	0.72
8	West Street	WB	6	4,300	2,524	0.59	3,195	0.74
9	CNR Corridor	NB	12	8,800	4,419	0.50	5,393	0.61
9	CNR Corridor	SB	12	8,800	4,379	0.50	6,277	0.71
10	Garden Avenue	EB	9	8,800	4,858	0.55	5,982	0.68
10	Garden Avenue	WB	9	8,800	4,649	0.53	6,336	0.72
11	Powerline Road	NB	13	9,400	4,307	0.46	6,015	0.64
11	Powerline Road	SB	13	9,400	4,825	0.51	6,434	0.68
12	Murray Street	EB	7	4,400	2,168	0.49	1,921	0.44
12	Murray Street	WB	8	5,200	1,681	0.32	2,874	0.55
13	West External	EB	7	7,300	1,711	0.23	2,285	0.31
13	West External	WB	7	7,300	1,684	0.23	2,184	0.30
14	South-West External	NB	4	4,300	1,598	0.37	1,251	0.29
14	South-West External	SB	4	4,300	973	0.23	1,749	0.41
15	East External	EB	5	6,900	3,149	0.46	3,827	0.55
15	East External	WB	5	6,900	3,289	0.48	3,951	0.57
16	North-East External	NB	3	3,200	1,444	0.45	1,729	0.54
16	North-East External	SB	3	3,200	1,254	0.39	2,347	0.73
17	North-West External	NB	3	3,300	789	0.24	932	0.28
17	North-West External	SB	3	3,300	800	0.24	998	0.30

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Notes: i) For more details on sreeenlines in general please see ***Chapter 2.0.Transportation Impacts of Growth*** in the 2020 TMP Update.

ii) Screenlines are illustrated in ***Figure 2-3*** of the 2020 TMP Update.

iii) Total (capacity) = the total roadway vehicle capacity of all lanes that cross a particular screenline in a particular direction.

iv) Volume = the total number of vehicles that cross a particular screenline in a particular direction during a particular peak hour.

4.3 Network Constraints and Solutions

While the TDM and Increased Network Infrastructure scenarios show significant potential to reduce congestion and delay in the network, neither strategy completely addresses the needs of the 2051 condition in isolation.

The next step in the transportation analysis was to assess the need for improvements in each of the constrained corridors, and consider the impact of each strategy (TDM, TSM, Increased Supply) on the constraint. This was done by assessing the 2051 Do Minimal scenario network performance to determine the magnitude performance issue (volume to capacity) and the travel characteristics of the demand in the corridor (select link analysis: origin and destination markets for future users).

Based on the critical deficiencies in the 2051 Do Minimal network alternative, an assessment of the impact of each strategy on each deficiency was undertaken, as well as an assessment of the alternatives for remediation. This analysis was primarily conducted for the PM peak hour which is considered the critical time period as it has the highest travel demands, unless otherwise noted.

4.3.1 Brant Avenue - St Paul Avenue to Colborne Street

Brant Avenue remains as documented in the 2020 TMP Update.

4.3.2 Wayne Gretzky Parkway - Henry Street to Highway 403

Wayne Gretzky Parkway remains as documented in the 2020 TMP Update.

4.3.3 Wayne Gretzky Parkway - North of Highway 403

Wayne Gretzky Parkway remains as documented in the 2020 TMP Update.

4.3.4 King George Road - Crossing Highway 403 to Dunsdon Street

King George Road remains as documented in the 2020 TMP Update.

4.3.5 Paris Road - Highway 403 to Powerline Road

Paris Road remains as documented in the 2020 TMP Update.

4.3.6 Colborne Street (Lorne Bridge) - Crossing the Grand River

Colborne Street (Lorne Bridge) remains as documented in the 2020 TMP Update.

4.3.7 West Street - Charing Cross Street to Henry Street

West Street remains as documented in the 2020 TMP Update.

4.3.8 Veterans Memorial Parkway - Mt. Pleasant Street to Market Street

Veterans Memorial Parkway remains as documented in the 2020 TMP Update.

4.3.9 Paris Road - South of Highway 403 to Hardy Road

Paris Road remains as documented in the 2020 TMP Update.

4.3.10 Powerline Road - Paris Road to Wayne Gretzky Parkway

Powerline Road remains as documented in the 2020 TMP Update.

4.3.11 Hardy Road - Ferrero Boulevard to Paris Road

Hardy Road remains as documented in the 2020 TMP Update.

4.3.12 Erie Avenue - Veterans Memorial Parkway/Clarence Street South to Birkett Lane

Erie Avenue remains as documented in the 2020 TMP Update.

4.3.13 Clarence Street/Clarence Street South – Dalhousie Street to Icomm Drive

Clarence Street remains as documented in the 2020 TMP Update.

4.3.14 Colborne Street West – County Road 7 to D'Aubigny Road

Colbourn Street West remains as documented in the 2020 TMP Update.

4.3.15 Overall Combined Improvement Scenario Assessment

The preferred solution network to address the forecast growth of the City to 2051 is a combined scenario that includes the following elements: transit service improvement/enhancements to promote increased transit use; the provision of active mode infrastructure to promote increased cycling and walking; and network infrastructure improvements to address the capacity constraints in the network. This solution results in a network and demand solution that addresses the identified long-term network deficiencies.

The performance of this combined scenario 2051 Recommended Plan shows that almost all of the anticipated roadway capacity issues identified for 2051 Do-Minimal condition (where no long-term investment was made in transit service, active transportation, or infrastructure) are resolved.

Figure 4-7 identifies the few remaining capacity/operational issues in the 2051 Recommended Network while ***Table 4-5*** displays the screenline capacity results in the 2051 Recommended Network. The remaining capacity/operational issues include the Lorne Bridge, Clarence Street South between Icomm Drive and Colborne Street East, and Paris Road. The transportation assessment suggests that while these are identified as capacity constraints in the long term, the magnitude of the issue has been significantly reduced. These issues are now forecast to be marginal and can be successfully managed in the near- and mid-term. These locations should continue to be monitored to identify the significance of any emerging issue.

It is also recommended that lands be protected in the Veterans Memorial Parkway partial extension (to Murray Street) corridor such that the opportunity to implement this improvement is not lost in the very long term.

Figure 4-7: 2051 Recommended Network: Capacity Constraints

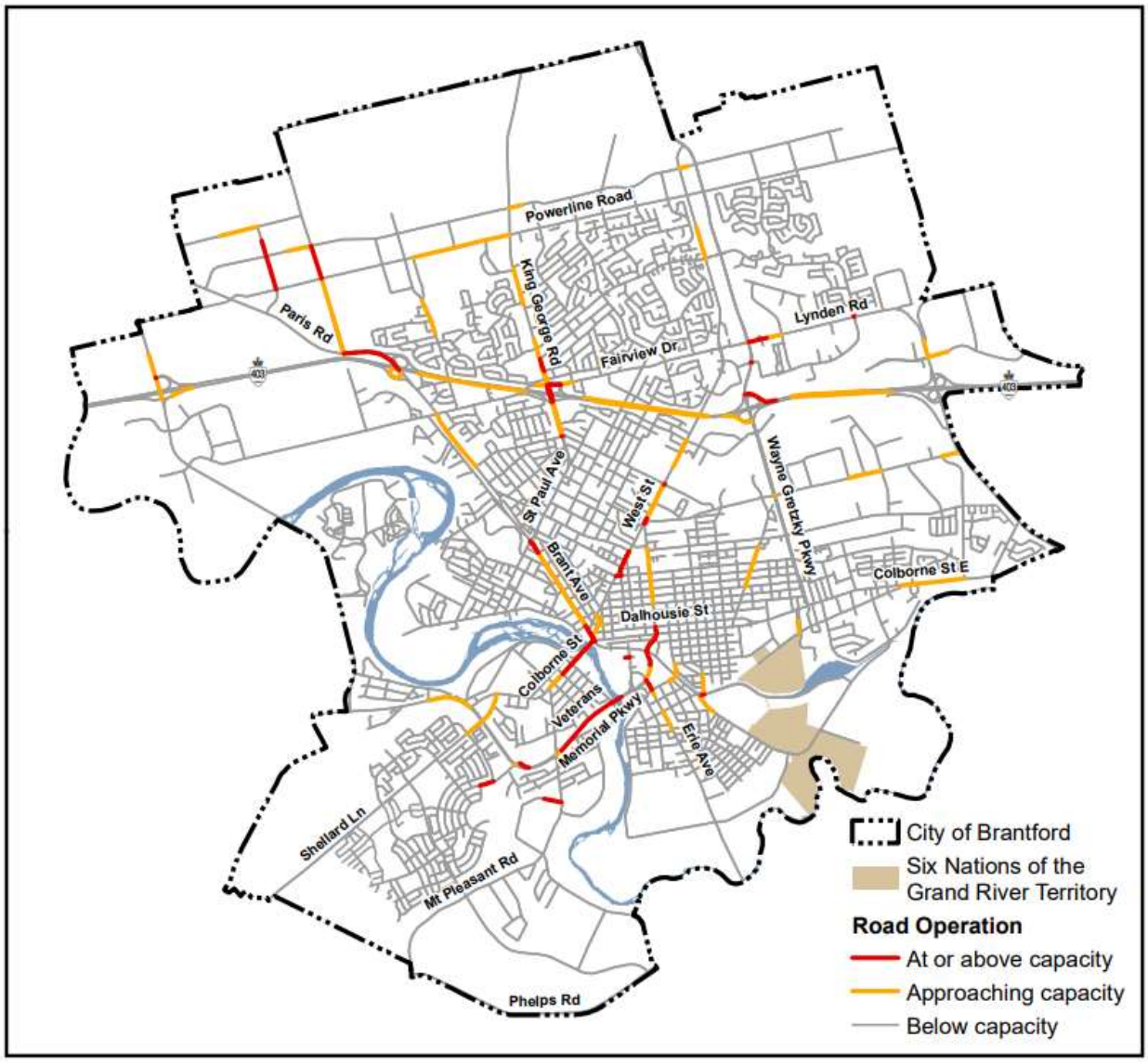


Table 4-5: 2051 Recommended: Screenline Assessment

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	10	11,100	6,813	0.61	6,393	0.58
1	Grand River South	WB	10	11,100	4,376	0.39	7,693	0.69
2	Grand River North	EB	4	5,200	2,825	0.54	4,183	0.80
2	Grand River North	WB	5	6,000	2,738	0.46	3,611	0.60
3	Highway 403	NB	14	12,200	6,912	0.57	8,805	0.72
3	Highway 403	SB	14	12,200	7,177	0.59	9,378	0.77
4	King George Road	EB	12	10,600	5,028	0.47	8,235	0.78
4	King George Road	WB	12	10,600	6,421	0.61	7,052	0.67
5	Wayne Gretzky Parkway (North)	EB	8	8,600	4,444	0.52	6,408	0.75
5	Wayne Gretzky Parkway (North)	WB	8	8,600	5,472	0.64	5,921	0.69
6	Wayne Gretzky Parkway (South)	EB	6	4,100	1,887	0.46	2,186	0.53
6	Wayne Gretzky Parkway (South)	WB	6	4,100	1,496	0.36	2,774	0.68
7	Memorial Drive	EB	8	5,900	1,618	0.27	3,133	0.53
7	Memorial Drive	WB	8	5,900	2,396	0.41	2,491	0.42
8	West Street	EB	6	4,300	1,967	0.46	2,838	0.66
8	West Street	WB	6	4,300	2,359	0.55	3,024	0.70
9	CNR Corridor	NB	11	7,900	4,122	0.52	5,038	0.64
9	CNR Corridor	SB	11	7,900	4,062	0.51	5,843	0.74
10	Garden Avenue	EB	8	8,000	4,705	0.59	5,716	0.71
10	Garden Avenue	WB	8	8,000	4,568	0.57	6,082	0.76
11	Powerline Road	NB	14	11,500	4,634	0.40	6,317	0.55
11	Powerline Road	SB	14	11,500	4,831	0.42	6,609	0.57
12	Murray Street	EB	7	4,400	2,148	0.49	1,750	0.40
12	Murray Street	WB	8	5,200	1,633	0.31	2,707	0.52
13	West External	EB	7	7,300	1,672	0.23	2,301	0.32
13	West External	WB	7	7,300	1,660	0.23	2,153	0.29
14	South-West External	NB	4	4,300	1,581	0.37	1,178	0.27
14	South-West External	SB	4	4,300	942	0.22	1,732	0.40
15	East External	EB	5	6,900	3,160	0.46	3,825	0.55
15	East External	WB	5	6,900	3,302	0.48	3,962	0.57
16	North-East External	NB	3	3,200	1,430	0.45	1,713	0.54
16	North-East External	SB	3	3,200	1,243	0.39	2,329	0.73
17	North-West External	NB	3	3,300	755	0.23	919	0.28
17	North-West External	SB	3	3,300	794	0.24	953	0.29

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Notes: i) For more details on sreeenlines in general please see ***Chapter 2.0.Transportation Impacts of Growth*** in the 2020 TMP Update.

ii) Screenlines are illustrated in ***Figure 2-3*** of the 2020 TMP Update.

iii) Total (capacity) = the total roadway vehicle capacity of all lanes that cross a particular screenline in a particular direction.

iv) Volume = the total number of vehicles that cross a particular screenline in a particular direction during a particular peak hour.

4.3.16 Goods Movement

Goods Movement remains as documented in the 2020 TMP Update.

4.4 Recommended Plan

4.4.1 Active Transportation

A key objective of the TMP is to work towards becoming a Bicycle Friendly Community by providing a clear, concise roadmap towards a more bicycle friendly future. Achieving this goal is dependent on providing full connectivity and the right environment to promote use and foster confidence in the system. This means addressing the needs of both recreational and utilitarian users. Full connectivity makes active transportation a feasible choice for any trip in the City. Providing the right space allows users of all skill to feel comfortable and choose routes that satisfy their safety and efficiency concerns by removing barriers to use.

Programs are also encouraged that support and encourage the use of active modes. Examples include bike-share/scooter share programs and employer/commercial incentives. While these are not within the scope of the TMP to define and implement, it is recognized that such programs can maximize the participation inactive modes of transportation. These programs would be the subject of more focussed or detailed work (i.e. Active Transportation Plan or TDM tasks as part of development Traffic Impact Studies).

Barriers to active transportation modes include highway crossings, traversing large urban intersections, travelling in close proximity to high volumes of fast-moving vehicles, and the lack of user amenities (bike racks, lockers, shower facilities, rest areas).

The existing and proposed cycling and trails network is shown in ***Figure 4-8***. The implementation of this network will add 145 km of additional cycling and trails facilities on to the existing 51 km of on road facilities and 96 km of off-road facilities. This network will provide a mix of on-road facilities (bike lanes and shared facilities) and off- road facilities (multi-use path and trails) that provide full connectivity for a full range of origins and destinations, and full range of user types/skills. ***Table 4-6*** summarizes the existing and proposed cycling and trails network by facility type.

As ***Table 4-6*** indicates, the majority of proposed Active Transportation Network changes are focused on on-road facilities. There are a few new multi-use paths / trails as a number of key roads are widened or extended. Overall, this strategy is taken because there is already a strong presence of multi-use paths / trails on non-roadway corridors and few additional corridors are available for exclusive use by Active Transportation use. A decided expansion of the Cycling and Trails Network along the road network is necessary to connect each community.

Sidewalks are incorporated into specific road design, where the cross- section elements have been defined for each roadway functional class to address the needs of all users. These design elements are part of the City's Linear Infrastructure Design Guidelines and have been updated to reflect the enhanced focus on active transportation and allow connection to the City Transit network.

Figure 4-8: Proposed 2051 Cycling and Trails Network

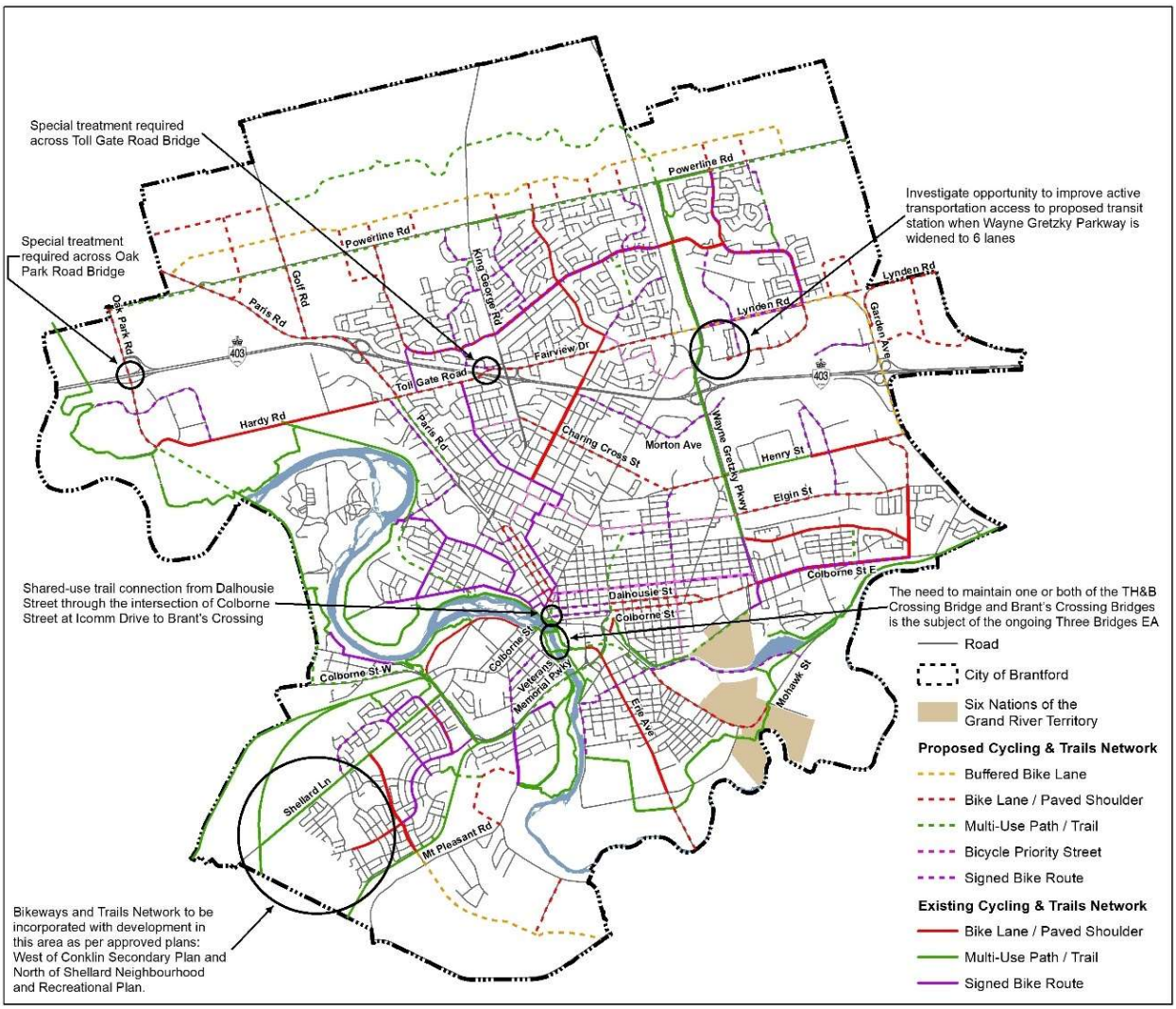


Table 4-6: Proposed 2051 Cycling and Trails Network Summary

Facility Type	Existing Length (centre line km)*	Proposed Length (centre line km)	Future Length (centre line km)
	On-Road		
Buffered Bike Lane	0.0	13.2	13.2
Bike Lane / Paved Shoulder	20.2	61.2	81.4
Bike Priority Street	0.0	10.0	10.0
Signed Bike Route	30.7	30.4	61.1
Sub Total	**50.9**	**114.8**	**165.7**
	Off-Road		
Multi-Use Path / Trail	95.5	30.2	125.7
Sub Total	**95.5**	**30.2**	**125.7**
TOTAL	**146.4**	**145.0**	**291.4**

* Existing lengths were calculated based on available information.

4.4.2 Transit

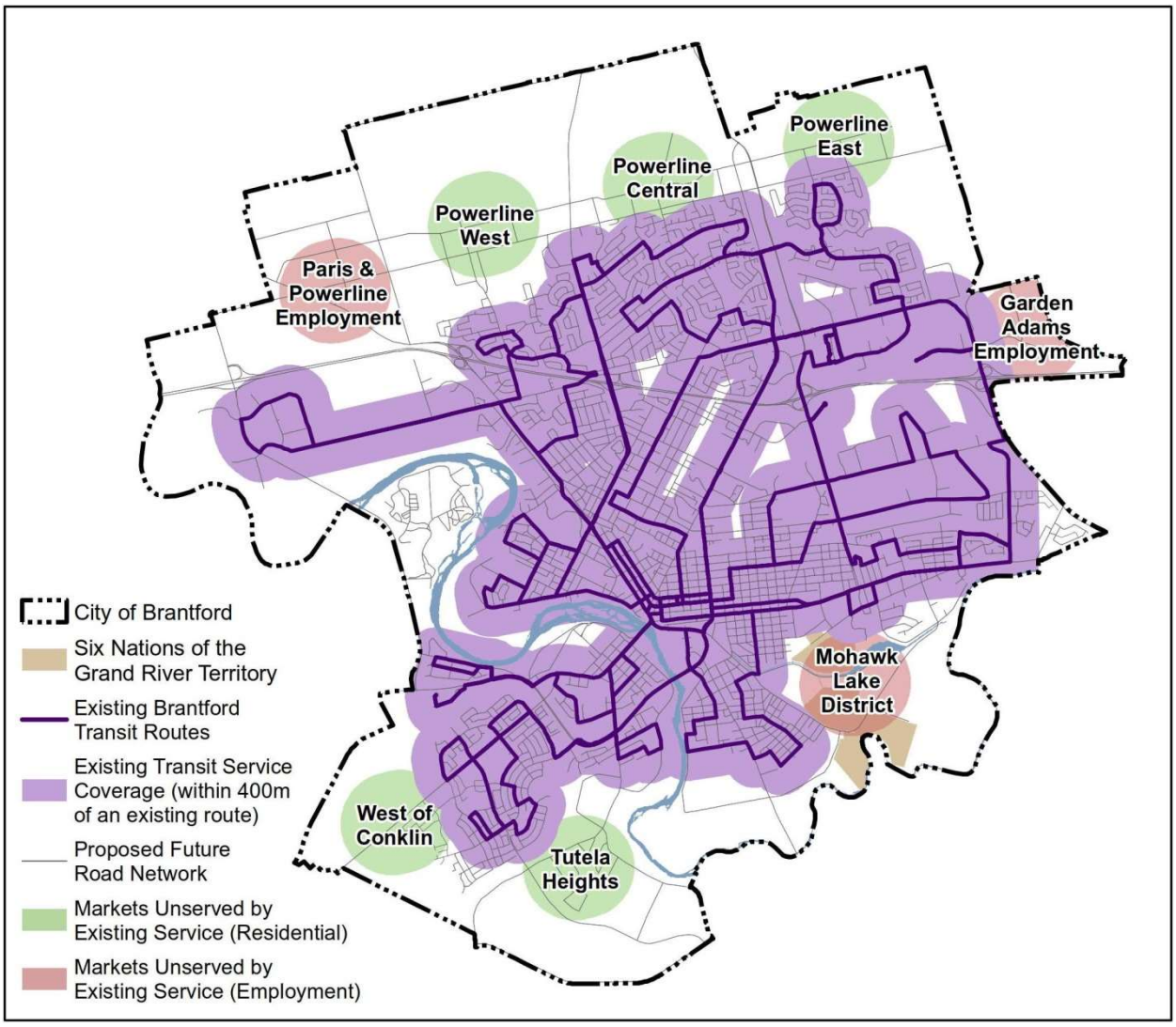
The scope of the Transportation Master Plan is to identify the role, need, and potential impact of the transit system in accommodating growth and moving people. The assessment has quantified the potential for ridership at the City wide and corridor levels.

The objectives with respect to the system coverage and expansion requirements for transit system are identified in ***Figure 4-9***.

The specific implementation plan for transit is provided in the next phase of the TMP (Implementation Plan). The implementation plan will identify the high-level service expansion and strategic service needs. However, with the expansion of transit service it is anticipated that the city fleet will be expanded to approximately 57 vehicles (40 conventional and 17 specialized), representing an increase of 25% in equipment.

The future transit service, routes and operational characteristics will be identified by future studies, i.e. a Transit Master Plan or Transit Operational Study that will provide estimates of the operational hours of services required to maintain the desired level of services throughout the network.

Figure 4-9: Proposed 2051 Transit Service Expansion and Enhancement



4.4.3 Road Network

From the transportation assessment, the roadway classifications and the infrastructure improvements for the 2051 horizon year have been identified as shown on ***Figure 4-10*** and ***Figure 4-11*** respectively.

The enhancements include infrastructure widening on:

- Wayne Gretzky Parkway between Henry Street and Lynden Road;
- Veterans Memorial Parkway between Mount Pleasant and Market Street South;
- Colborne Street West from County Road 7 to the existing 4-lane section;
- Paris Road from Golf Road to City Limits;
- Oak Park Road from Hardy Road to Powerline Road (including the Highway 403 interchange upgrade to ultimate design); and
- Powerline Road from Oak Park Road to the City east limits.

New road additions include:

- Oak Park Road extension to Colborne Road West;
- Wayne Gretzky Parkway extension to connect with Park Road;
- East-West Collector Road north of Powerline Road from Oak Park Road to East City Limits;
- Conklin Road Extension from Mt. Pleasant Road to Phelps Road; and
- Charing Cross Street extension to Henry Street.

All of the projects identified will require a Schedule B or C MCEA to be completed, which would include significant public/stakeholder consultation, before they can be implemented.

TSM improvements to enhance the existing capacity (through urbanization, parking restrictions, and operational improvements, including roundabout implementation) are proposed for several corridors including:

- Golf Road;
- Paris Road;
- Brant Ave;
- Hardy Road;
- West Street;
- King George Road;
- Erie Avenue;
- Clarence Street/Clarence Street South; and
- County Road 18 (note that this is a County Road. The City will be required to work with the County in determining potential for improvements to the corridor, impacts, and costs).

TSM projects do not require Schedule B/C EA, but this TMP forms the basis for phase 1 and 2 of an EA for individual projects.

It is also recommended that lands be protected in the Veterans Memorial Parkway partial extension (to Murray Street) corridor such that the opportunity to implement this improvement is not lost in the very long term.

Figure 4-10: Roadway Classification

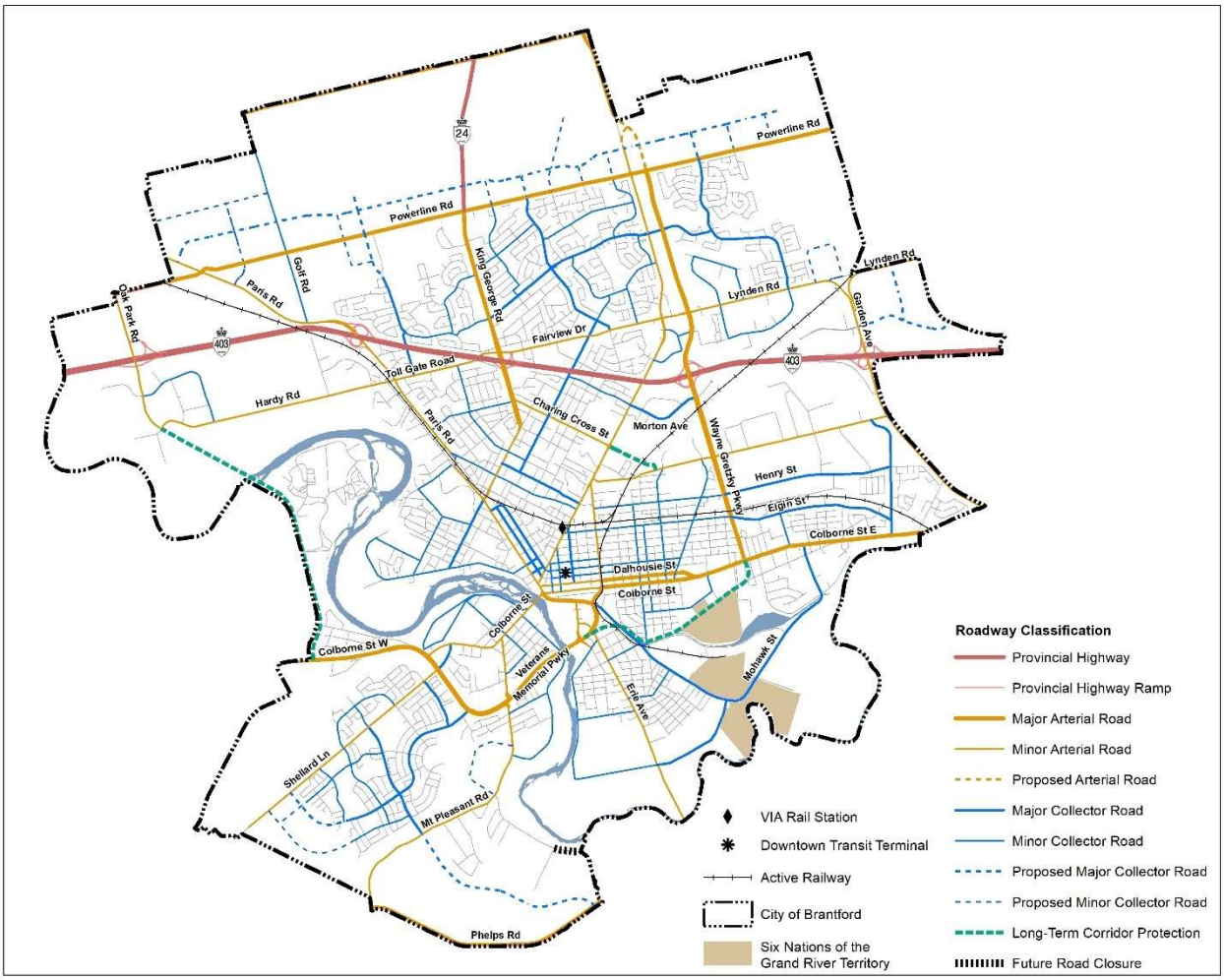
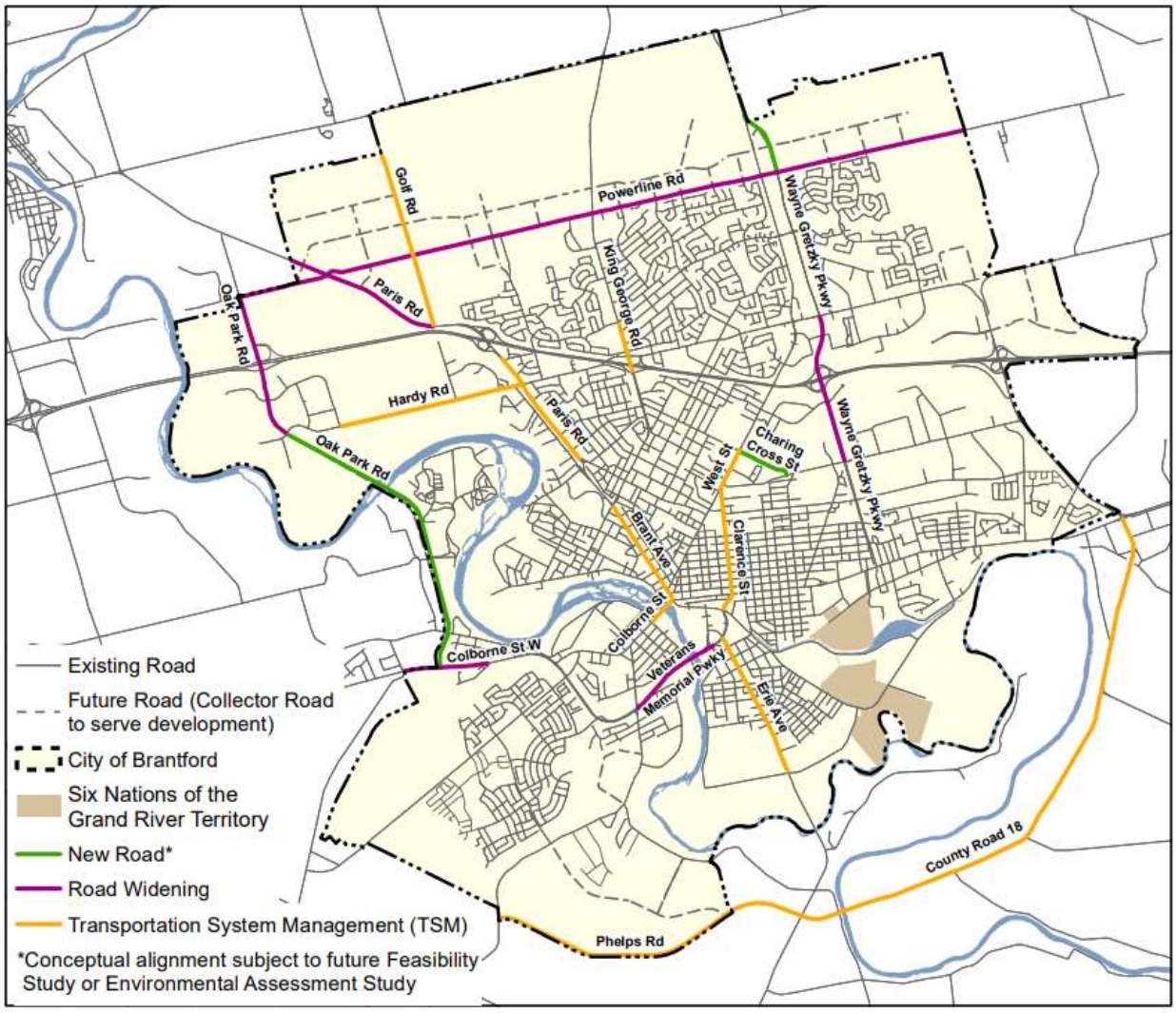


Figure 4-11: Proposed 2051 Road Network

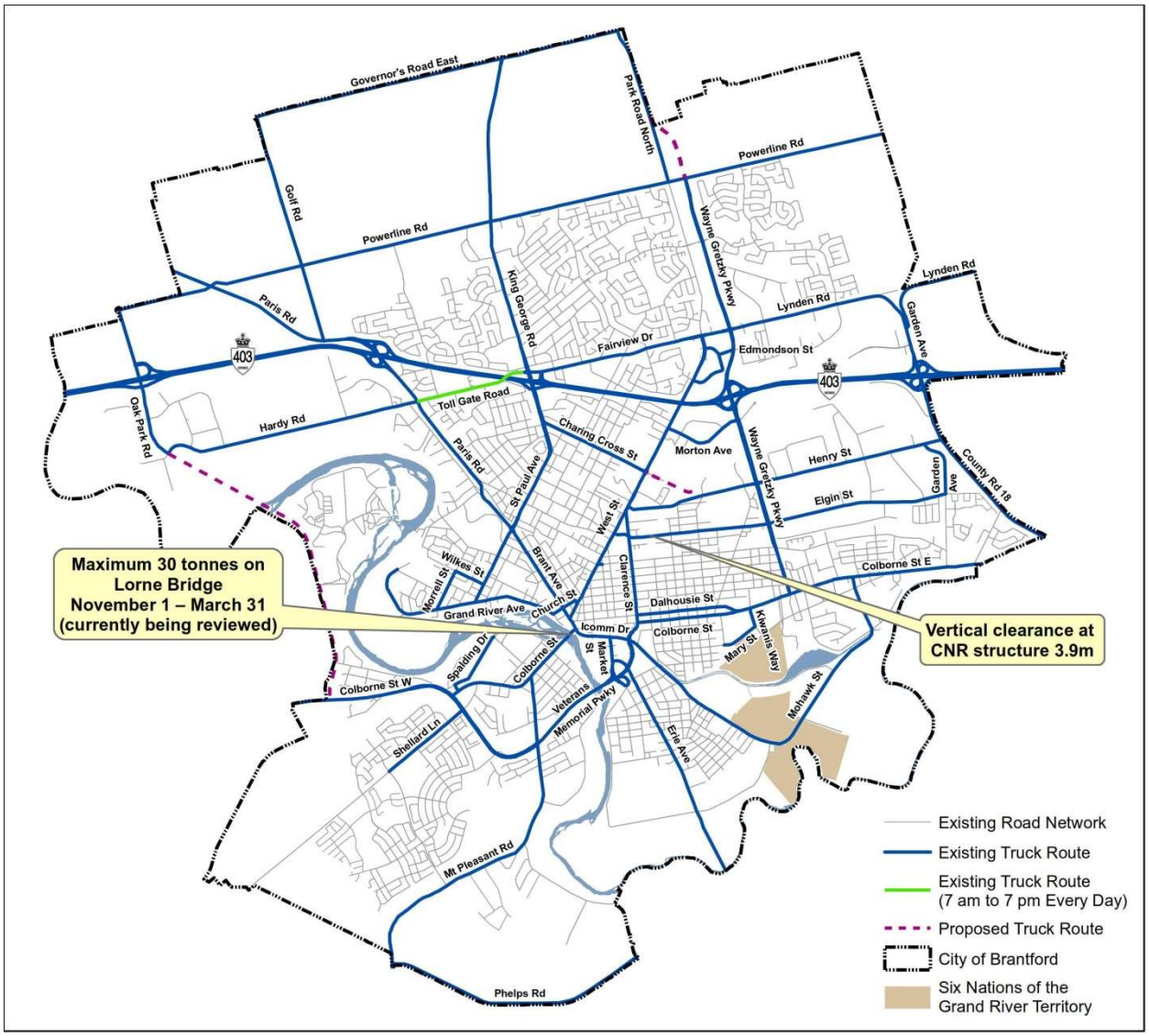


4.4.4 Goods Movement

Figure 4-12 highlights the existing truck route designations with modifications to reflect future potential changes. Specific changes include:

- Addition of the future Charing Cross Street Extension; and
- Additions of the future Oak Park Road Extension.

Figure 4-12: Proposed 2051 Truck Routes



5.0 Implementation Plan

5.1 Active Transportation

5.1.1 Strategy

The 2020 TMP Update includes an expansion of the City Cycling and Trails Network, building on the 2014 TMP plan, to include the extension of multi-use paths and trails into the Tutela Heights and North Expansion lands. In addition, enhancements have been made to conform to new initiatives and policies now in place (OTM Book 18 revisions since 2014).

The capital cost to provide these facilities is estimated at $31.7 Million to the year 2051. This includes ***Table 5-1*** summarizes the total length and estimated costs of the proposed facilities in the Cycling and Trails Network.

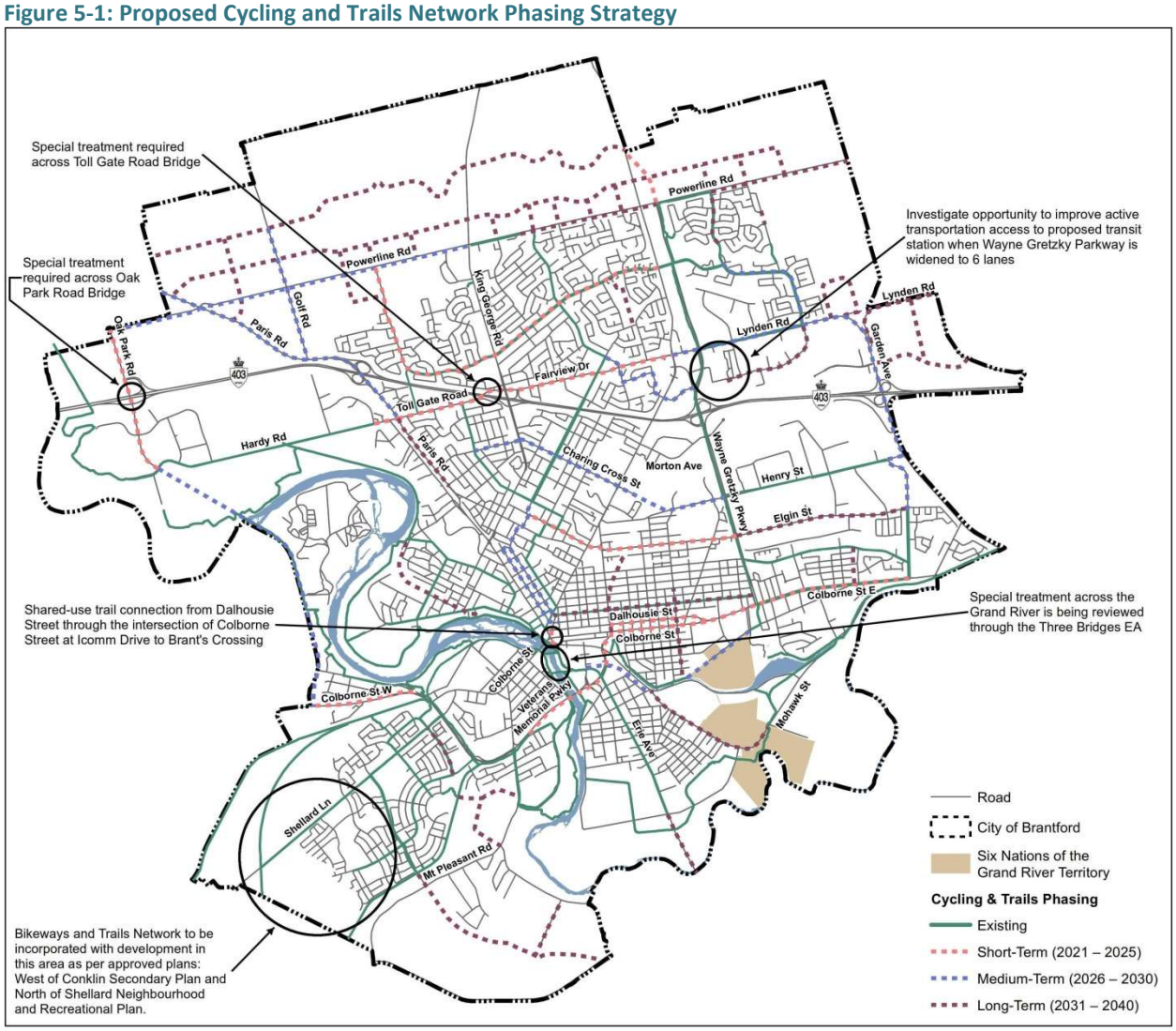
Table 5-1: Proposed 2051 Cycling and Trails Network Summary

Facility Type	Length (centre line km)	Cost ($000)*
On-Road		
Buffered Bike Lane	13.2	$4,244
Bike Lane / Paved Shoulder	61.2	$17,434
Bike Priority Street	10.0	$1,265
Signed Bike Route	30.4	$42
Sub Total	**114.8**	**$22,984**
Off-Road		
Multi-Use Path / Trail	30.2	$5,851
Sub Total	**30.2**	**$5,851**
Other		
Programs (Studies, Initiatives, Events)	-	$2,885
Sub Total	-	**$2,885**
TOTAL	**145.0**	**$31,720**

* All costs stated in 2020 dollars.

Figure 5-1 illustrates the recommended phasing and implementation plan for the Cycling and Trails Network. Several factors were critical in developing the phasing and implementation. Priority of the proposed routes were assessed based on: the timing of new roadways / roadway upgrades, the lack of safe and comfortable routes for cycling in surrounding area, its ability to connect isolated communities, its ability to attract a wider range of the potential cyclists, project complexity, estimated costs and timing of related road improvement projects.

Figure 5-1: Proposed Cycling and Trails Network Phasing Strategy



5.1.2 Implementation

5.1.2.1 Short Term (2021-202)

Routes in this phase represent those that complement the core network of existing / short-term routes. It may also include other critical links that are higher costs or require a more detailed analysis to implement. Examples are routes that require widening or road reconfiguration on arterial roads to accommodate on-street facilities. Projects related to a road improvement were phased according to the proposed road improvement project.

5.1.2.2 Medium Term (2026-2031)

Routes in this phase represent those that complement the core network of existing / short-term routes. It may also include other critical links that are higher costs or require a more detailed analysis to implement. Examples are routes that require widening or road reconfiguration on arterial roads to

accommodate on-street facilities. Projects related to a road improvement were phased according to the proposed road improvement project.

5.1.2.3 Long Term (2032-2051)

Routes in this phase represent remaining links that will enhance the Cycling and Trails Network. Some routes may represent a lower priority; however, some routes are anticipated over the long-term due to other restrictions such as necessary coordination with other municipalities, project complexity, and estimated costs. Projects related to a road improvement were phased according to the proposed road improvement project.

5.1.2.4 Cost

The capital cost to provide the proposed Cycling and Trails Network is estimated at $31.7 Million to year 2051. ***Table 5-2*** summarizes the recommendations for the short, medium and long term to 2051.

Table 5-2: Cycling and Trails Recommendations by Time Frame

Facility Type	Length (centre line km)	Cost ($000)*
Short Term [2021 – 2025]		
Signed Bike Route	7.6	$10
Bike Priority Street	3.0	$380
Bike Lanes / Paved Shoulders	16.6	$1,640
Multi-Use Paths	4.7	$529
Programs (Studies, Initiatives, Events)	-	$820
Sub Total	**31.9**	**$3,379**
Mid Term [2026 – 2031]		
Signed Bike Route	7.6	$10
Bike Priority Street	3.1	$392
Bike Lanes / Paved Shoulders	22.4	$7,146
Multi-Use Paths	10.1	$845
Programs (Studies, Initiatives, Events)	-	$690
Sub Total	**43.2**	**$9,084**
Long Term [2032 – 2051]		
Signed Bike Route	15.2	$21
Bike Priority Street	3.9	$493
Bike Lanes / Paved Shoulders	35.4	$12,891
Multi-Use Paths	15.4	$4,476
Programs (Studies, Initiatives, Events)	-	$1,375
Sub Total	**69.9**	**$19,257**
TOTAL	**145.0**	**$31,720**

* All costs stated in 2020 dollars & Contingency of 30% for Engineering assumed (excludes Programs).

The proposed projects by time frame and estimated cost can be found in ***Appendix D.***

5.1.1 Monitoring

Monitoring remains as documented in the 2020 TMP Update.

5.2 Transit

5.2.1 Strategy

The preferred strategic direction for the 2020 TMP Update is to provide enhanced focus on transit by 2051. The TMP transit policies have been structured to provide an incremental approach to achieving these levels.

In the short to medium term, improvements to key performing transit routes will be provided through marketing, route changes and the addition of new routes as recommended in the 2016 Transit Service Plan *TRANSFormation 2021* study. The objective of these changes is to increase transit ridership through the improvement of service efficiency and comfort.

Between 2031 and 2051, the City will pursue the more aggressive "Transit Focus" approach in conjunction with continued population growth and growth in new areas of the city. The 'Transit Focus' will target improvements to key routes, increased service levels and frequencies and introduction of express routes between key residential and employment areas. It is envisioned that by 2051, this strategy will improve the transit mode share to 5.8% as a result of growth and increased use of transit.

Achieving an increase in ridership of this magnitude will require increased financial investment by the City, supported by strong transit-supportive policies related to the supply and cost of parking, Transportation Demand Management, land use planning and development, and transit priority measures on Brantford streets so that the conventional transit service is convenient, attractive to potential users, and competitive with the private automobile.

The following recommended policies to encourage increased transit use include a number of polices related to Transportation Demand Management, Parking, and Active Transportation. These transit-specific policies outline specific transit service improvements to achieve the ridership increases outlined in the preferred strategy.

5.2.2 Implementation

5.2.2.1 Short Term (2021-2025)

In the short term, the transit service improvement strategy should focus on the following recommended actions:

- Implement the recommendations of the 2016 Transit Service Plan, including adjustments to existing routes and schedules to improve schedule adherence and travel times;

- Increase the number of shelters at stops towards a coverage rate of 25% to increase the attractiveness and convenience of using transit;
- Make monthly passes more convenient to purchase and re-charge including on-line options;
- Prepare a marketing and communications plan and promotional materials to encourage and maintain transit ridership including a new transit route, schedule/information brochure;
- Investigate opportunities to implement transit priority on key corridors;
- Apply transit-supportive urban design guidelines to assist in making new developments easier to serve with transit;
- Work with County to extend and improve GO Transit service to key destinations (GTA, Cambridge/Kitchener/Waterloo);
- In conjunction with the County of Brant, explore the re-introduction of transit service to Paris;
- Enhance suburban transfer facilities. The facilities (i.e. bus circulation and shelters) at the major malls in the east and north ends of the City (Lynden Park Mall and Brantford Commons respectively) need to be improved to provide passenger amenities for transit users destined to these malls, as well as for transit users transferring between routes. Transit routes would link to these facilities with the objective of reducing travel times and to improve service coverage in future growth areas; and
- Initiate Transit Master Plan Study to assess next level strategies and implementation, and identify performance metrics and operational details if the transit system. The transit master plan would identify the key policies required to achieve an improved transit focus for travel in the City.

5.2.2.2 Medium Term (2026-2031)

In the medium term, the transit service improvement strategy should focus on the following recommended actions:

- Implement transit service in new development areas to build ridership early;
- Continued investment in conventional and specialized buses;
- Continued investment in additional transit shelters;
- Continue restructuring routes to shorten travel times; and
- Increase core and peak hour service frequencies on key routes.

5.2.2.3 Long Term (2032-2051)

In the long term, the transit service improvement strategy should focus on the following recommended actions:

- Implement and expand transit service in new development areas;
- Continued investment in conventional and specialized buses;
- Continued investment in additional transit shelters;
- Continue restructuring routes to shorten travel times;
- Introduce transit priority measure;
- Introduce express routes linking key residential and employment areas; and

- Build new / upgrade existing downtown transit terminal.

5.2.2.4 Cost

The capital cost to provide this system is estimated at $97 Million to year 2051. ***Table 5-3*** summarizes the recommendations for the short, medium and long term to 2051.

Table 5-3: Transit Service Recommendations by Time Frame

Capital Item	Description	Cost ($000)*
Short Term [2021 – 2025]		
Fleet	1 new vehicle, 13 replacement vehicles	$15,400
Building	-	$ -
Transfer Points	Lynden Mall, Brantford Commons - Upgrades	$500
Route Infrastructure	Signage and Shelters Upgrade, ITS	$561
Studies	Transit TMP, Fleet Electrification Feasibility	$375
Specialized	Vehicle Replacement, Telecom Software	$1,570
	Sub Total	**$18,406**
Mid Term [2026 – 2031]		
Fleet	2 new vehicles, 10 replacement vehicles	$13,200
Building	Transit Center	$1,100
Transfer Points	-	$ -
Route Infrastructure	New Stops/ Shelters Expansion Routes/ITS	$651
Studies	Transit Master Plan Update	$100
Specialized	Vehicle Replacement	$3,750
	Sub Total	**$18,801**
Long Term [2032 – 2051]		
Fleet	5 new vehicles, 12 replacement vehicles	$37,400
Building	New/Upgrade Transit Terminal	$7,500
Transfer Points	-	$ -
Route Infrastructure	New Stops/ Shelters Expansion Routes/ITS	$3,240
Studies	-	$ 100
Specialized	Vehicle Replacement, Software Upgrade	$11,600
	Sub Total	**$59, 840**
	TOTAL	**$97,047**

* All costs stated in 2020 dollars.

The proposed projects by time frame and estimated cost can be found in ***Appendix D.***

5.2.3 Monitoring

Monitoring remains as documented in the 2020 TMP Update.

5.3 Road Network

5.3.1 Strategy

For Road Infrastructure, estimates of interim year population and employment, 2026 and 2031, and the 2051 network performance assessment were used to generate a timeline for emerging constraints. The performance constraints were compared with the 2051 network recommendations to determine the likely need for infrastructure improvement for the interim years.

These network improvements have been combined with the TDM and TSM strategies to provide solutions that leverage the benefits of non-structural improvement to defer, as much as possible, the costs of required infrastructure.

5.3.2 Implementation

5.3.2.1 Travel Demand Management (TDM) Strategy

A TDM strategy is required for the City of Brantford with the objective of reducing single occupant vehicle travel and achieving the vehicle reduction targets identified in the transportation assessment. While based on the principles of this plan, the TDM strategy would be a separate exercise that could be done internally (i.e. with a TDM Coordinator) or by contracting it out to an external TDM expert if internal resources are not in place.

With the recent update to the City's Official Plan, the first priority for the overall TDM strategy would be to incorporate the TDM policies the City's planning documents. This stresses the importance of land use in helping manage transportation demand and meet single occupant vehicle reduction targets. A key component of the Official Plan is to identify policies that promote intensification, mixed use development, and pedestrian friendly design, which are supportive of the TDM strategy. The recommended TDM implementation Plan is provided in ***Table 5-4*****.**

For all of the elements identified, the City must consult and engage: special interest groups, stakeholders, business community, accessibility agencies, community / senior centres, MTO, GO Transit, in the development of the program and plans. This includes projects initiated by others.

Table 5-4: TDM Recommended Implementation Plan

Proposed Action	1-5 years	6-10 years	11-30 years	Next Steps
Adopt a TDM Policy	x			Based on the Guiding Principles of this plan. Included in the Official Plan update.
Develop Trip Reduction Program for the Town Municipal Offices/Facilities	x	x	x	Internal Strategy developed by TDM Coordinator
Engage major employers and institutions to participate in trip reduction initiatives		x	x	Internal Strategy developed by TDM Coordinator
Encourage development of Activity Hubs	x	x	x	Include policies in Official Plan and Secondary Plans as appropriate
Include TDM in the development process	x	x	x	Include in Secondary Plans as well as approval of large development applications as appropriate

5.3.2.2 Transportation System Management (TSM) Strategy

A TSM Strategy should be developed for the City of Brantford. The objective of TSM is to maximize the use of the existing roadway infrastructure before expanding existing or constructing new facilities. Particular areas of concern in the longer term have been identified in the transportation assessment as: the existing bridge crossings of the Grand River; the Paris Road/ Brant Avenue corridor, and the King George Road Corridor. The recommended TSM implementation Plan is provided in ***Table 5-5*.**

Table 5-5: TSM Recommended Implementation Plan

Proposed Action	1-5 years	6-10 years	11-30 years	Next Steps
Prepare Access Management Guidelines	x			Initiate Separate Study. Include policies in Official Plan and Secondary Plans as appropriate.
Refine Right-of-Way Requirements to include Multi-Modal consideration for all roadway classifications	x			Per Complete Streets section of this TMP and ensure that objective are incorporated into City Design Guidelines Manual
Adopt Roundabout Implementation Strategy	x			Per Complete Streets section of this TMP, and City's Roundabout Installation Policy and Guideline toolbox.

With regard to the adoption of a roundabout strategy, the City has recently approved an installation Policy and developed guidelines for roundabout use and an analysis toolkit for their implementation. These elements include:

- Policy Direction (PW-022 Roundabout Installation Policy)
- Technical process checklist

The decision making process relies primarily on the technical elements: Initial screening criteria identified (which only confirms feasibility, not rationale for implementation); and Evaluation which identifies the criteria, weighting process, and scoring process for where a roundabout is preferred over traditional intersection control. The analysis toolkit still does not address the "role, desire, and overall rationale" for an implementation strategy.

The City's policy recognizes that not all intersections are going to suit roundabout implementation. There are typically four reasons for implementing roundabouts, which answer the question "What are we trying to achieve with roundabout implementation?":

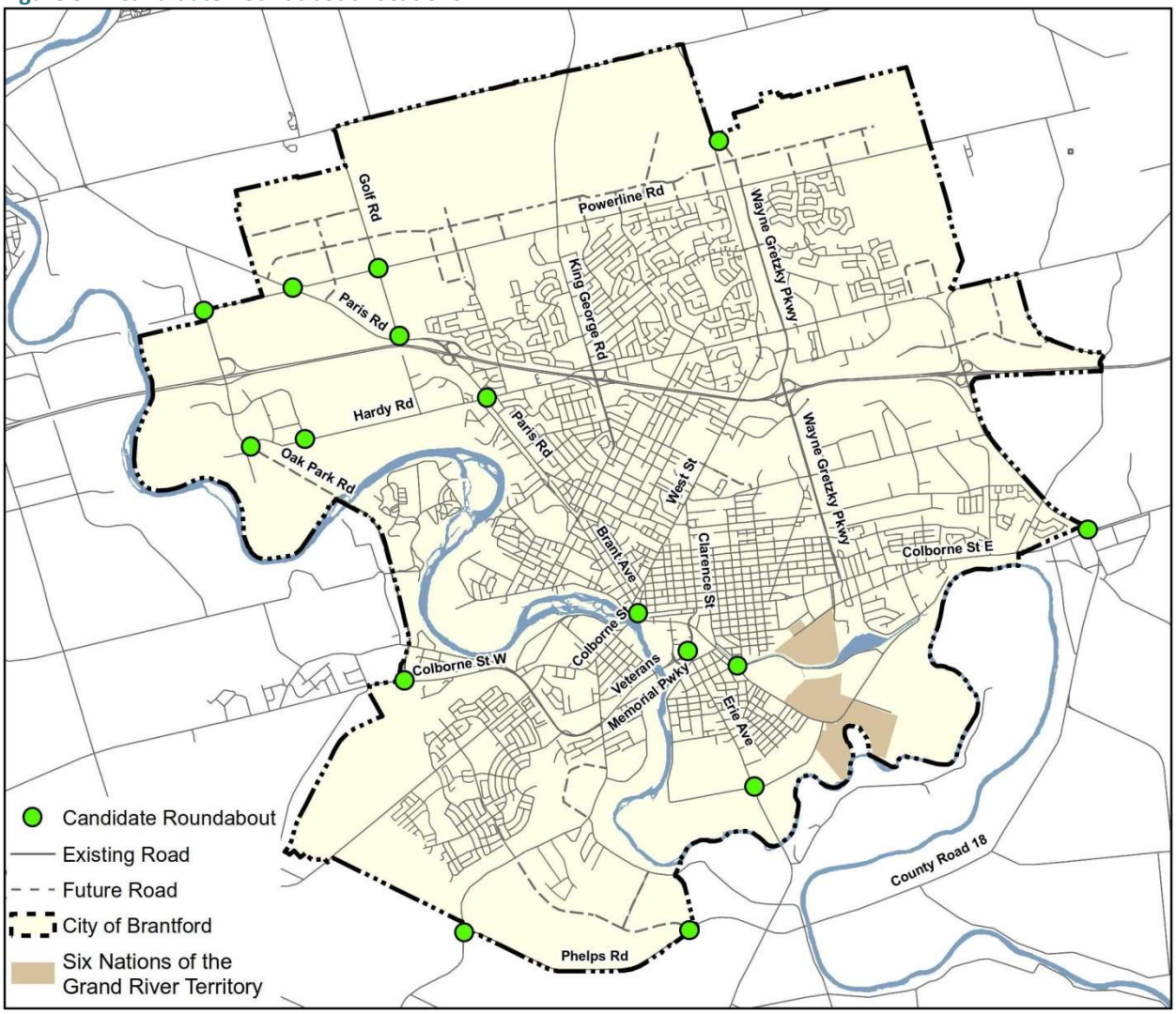
- Improve Operations – reduce delay for high volume turning movements
- Traffic Calming – reduce speed
- Improve Safety – reduce conflicts
- Gateway – visual cue re: changing environment

It is necessary to set goals, objectives, and direction for specific locations prior to undertaking technical analysis to justify / trade off against signalization.

With several corridors identified for consideration of TSM applications, it seems appropriate to target these corridors for potential roundabout implementation. In addition to having specific operational issues, several corridors transition from rural to suburban or suburban to urban environments making the good candidates for gateway treatments. Using the TSM findings as a guide, a list of candidate roundabout locations has been identified for this TMP, as shown in ***Figure 5-2***.

These are only meant to be candidate locations to be subject of future analysis using the City's roundabout guidelines. Through the development of a roundabout strategy, the City can expand the scope of this work to address local operational and safety issues. As well, any future Environmental Assessment or Traffic Impact Study will assess the need and feasibility of traffic control (including signalization versus roundabout implementation)

Figure 5-2: Candidate Roundabout Locations



5.3.2.3 Short Term (2021-2025)

In the short-term, the road infrastructure improvement strategy should focus on the following recommended projects:

- Veterans Memorial Parkway (MCEA Schedule C): Widening to 4 lanes from Mount Pleasant Street to Erie Avenue. To increase Grand River crossing capacity to serve ongoing planned growth in Southwest Brantford;
- Oak Park Road (MCEA Schedule C): Widening to 4 lanes from Powerline Road to Hwy 403 and Fen Ridge Court/Savannah Oaks Drive to Hardy Road. To serve growing business access needs in the northwest Brantford industrial area to/from Highway 403;
- Colborne Street West (MCEA Schedule C): Widening to 4 lanes from County Road 7 (Pleasant Ridge) to D'Aubigny Road. To serve trips travelling from the north and west into Downtown

Brantford and for trips travelling between southwest Brantford and northwest Brantford / Brant County; and

- Wayne Gretzky Parkway (MCEA Schedule C): 4-lane extension from Powerline Road to Park Road North. To provide continuous and consistent arterial capacity between Highway 403 and Governors Road, serving both new development trips and longer distance trips from the congested King George corridor.

5.3.2.4 Medium Term (2026-2031)

In the medium-term, the road infrastructure improvement strategy should focus on the following recommended projects:

- Oak Park Road (MCEA Schedule C): 4-lane extension from Hardy Road to Colborne Street West. To address projected road network capacity deficiencies across the Grand River, and significantly relieve the Paris Road/Brant Avenue corridors to and from the central part of the city and the downtown. It will also connect the southwest development area with the northwest industrial area and Highway 403;
- Paris Road (MCEA Schedule C): Widening to 4 lanes from City Limits to Golf Road. To address capacity needs for the northwest industrial are access to Highway 401 and for longer distance trips into Downtown Brantford;
- Powerline Road (MCEA Schedule C): Widening to 4 lanes (including urbanization) from Oak Park Road to King George Road. To address projected east-west road network capacity deficiencies along the south edge of the future north expansion area. It will connect the northwest industrial area to the north Brantford residential base;
- Charing Cross Street (MCEA Schedule C): 4-lane extension from West Street to Henry Street, with grade separation at CN Rail crossing. To address projected capacity deficiencies on West St. due to the jog between Charing Cross Street and Henry Street, and to provide a new continuous east-west arterial road in central Brantford between King George Rd. and Garden Avenue;
- Golf Road TSM (MCEA Schedule B): Paris Road to Proposed Development Limit north of Powerline Road. Widen roadway bed and urbanize road to provide multi-modal environment consistent with urban arterial (including appropriate traffic control and auxiliary turn lanes and/or roundabouts). Addresses traffic destined to / generated by build out of the northwest industrial area; and
- Mohawk Street / Greenwich Street / Murray Street intersection improvements (MCEA Schedule B or C to be confirmed through more detailed traffic study): Mohawk Street and intersection realignment and possible upgrade to a roundabout. Addresses traffic destined to / generated by build out of the Mohawk Lake development area.

5.3.2.5 Long Term (2032-2051)

In the long-term, the road infrastructure improvement strategy should focus on the following recommended projects:

- Wayne Gretzky Parkway (MCEA Schedule C): Widening to 6 lanes from Lynden Road to Henry Street. To address long term city growth and associated capacity deficiencies on Wayne Gretzky Parkway, especially across the Highway 403 and CN Rail screenlines.;
- Powerline Road (MCEA Schedule C): Widening to 4 lanes from King George Road to East City Boundary. To address projected east-west road network capacity deficiencies along the south edge of the future north expansion area. It will connect the northwest industrial area to the north Brantford residential base;
- Conklin Road (MCEA Schedule C): 2-lane extension from Mt. Pleasant Road to Phelps Road. Addresses traffic generated by build out of the Shellard Lane and Tutela Heights development areas. Provides alternate access to the east and north via Phelps Road/County Road 18;
- New East/West Collector Road (north extension area) (MCEA Schedule B): New 2 lane collector road from Oak Park Road to King George Road. Addresses traffic generated by build out of the north expansion development area. Relieves traffic volumes on Powerline Road and provide collector function for all travel modes;
- New East/West Collector Road (MCEA Schedule B): New 2 lane collector road from King George Road to East City Boundary. Addresses traffic generated by build out of the north expansion development area. Relieves traffic volumes on Powerline Road and provide collector function for all travel modes;
- Clarence Street TSM (MCEA Schedule B): Provide Intersection improvements at Colborne Street, Dalhousie Street, Darling Street and West Street and implement peak hour turning restrictions north of Darling Street to West Street;
- Highway 403 / Oak Park Road Interchange (Ontario Environmental Assessment Act (OEAA) Schedule A - complete): Upgrade interchange to the ultimate configuration (Parclo Interchange Design) and widen Oak Park Road to 4 lanes. Addresses traffic destined to / generated by build out of the northwest industrial area; and
- Protected lands in the Veterans Memorial Parkway partial extension (to Murray Street) corridor such that the opportunity to implement this improvement is not lost in the very long term.

The result is that fourteen (15) main roadway network improvement projects are recommended for Brantford by 2051, as previously identified in ***Figure 4-11***. Most projects will require further public consultation, Environmental Assessment and Council approval prior to implementation.

5.3.2.6 Cost

The capital cost to provide this infrastructure (some 80 lane kilometres of network) is estimated at $328 Million to year 2051. ***Table 5-6*** summarizes the recommendations for the short, medium and long term to 2051.

Table 5-6: Road Infrastructure Recommendations by Time Frame

Project	Description	Cost ($000)***
Short Term [2021 – 2025]		
Veterans Memorial Parkway Widening	4 lanes – Mount Pleasant Street to Erie Avenue*	$40,500
Oak Park Road Widening	4 lanes – Powerline Road to Hwy 403 & Fen Ridge Court/Savannah Oaks Drive to Hardy Road	$6,400
Colborne Street West Widening	4 lanes – CR7 to D'Aubigny Road	$3,500
Wayne Gretzky Parkway Extension	4 lanes - Powerline Road to Park Road North	$4,100
	Sub-Total	**$54,500**
Mid Term [2026 – 2031]		
Oak Park Road Extension	4 Lanes – Hardy Road to Colborne Street **	$98,900
Paris Road Widening	4 lanes – City Limits to Golf Road	$10,800
Powerline Road Widening	4 lanes – Oak Park Road to King George Road	$19,900
Charing Cross Extension	4 Lanes – West Street to Henry Street	$19,000
Golf Road TSM	Paris Road to Proposed Development Limit	$5,300
Mohawk Street / Greenwich Street / Murray Street Intersection	Intersection realignment and improvements	$3,600
	Sub-Total	**$157,500**
Long Term [2032 – 2051]		
Wayne Gretzky Parkway Widening	6 Lane – Lynden Road to Henry Street	$29,100
Powerline Road Widening	4 lanes – King George Road to East City Boundary	$21,000
Conklin Road Extension	2 lanes - Mt. Pleasant Road to Phelps Road	$10,200
New East/West Road	2 lanes – Powerline Road east of Oak Park Road to King George Road	$15,300
New East/West Road	2 lanes – King George Road to East City Boundary	$16,400
Clarence Street TSM	Icomm Drive to West Street	$6,300
Highway 403 / Oak Park Road Interchange	Upgrade to ultimate configuration	$18,000
	Sub-Total	**$116,300**
	TOTAL	**$328,300**

* Reference Costs Source: Veterans Memorial Parkway Widening and Extension, CIMA+, October 2018 - [Assume: Mt Pleasant to Bridge = 950 m (from feasibility study) and Bridge to existing 4-lane cross section west of Erie = 240 m]

** Reference Costs Source: Oak Park Road Extension Feasibility Study, Parsons, July 2019

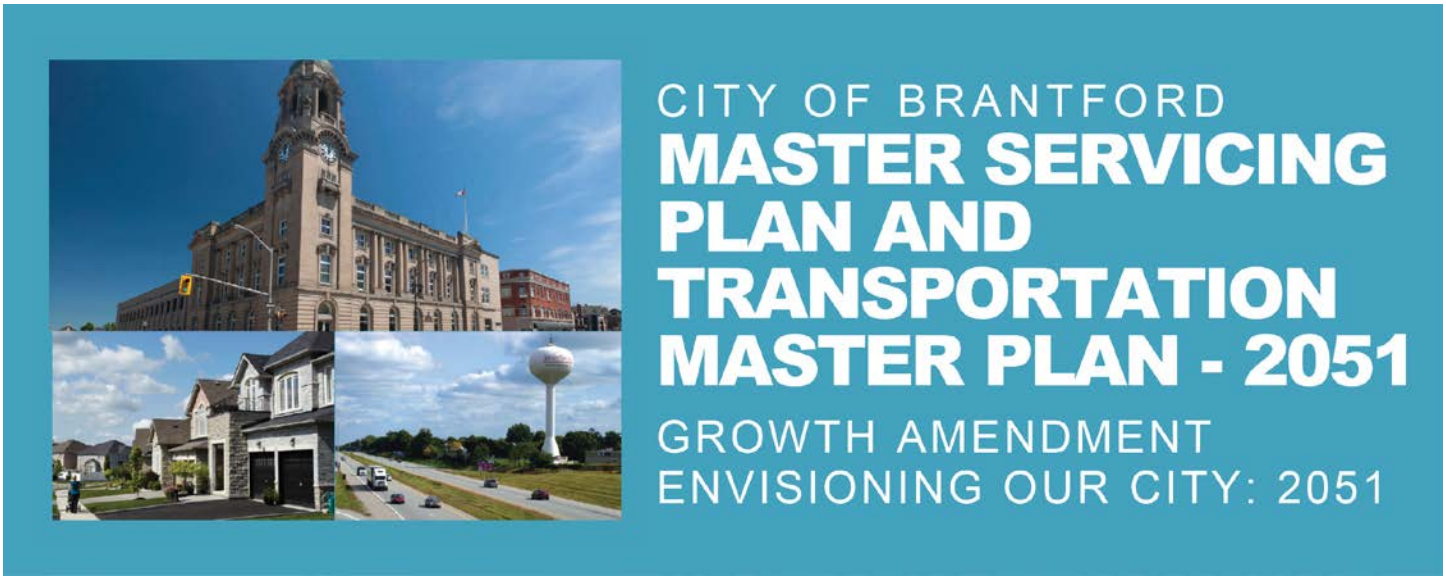
*** All costs stated in 2020 dollars & Contingency of 20% for Construction and 30% for Engineering assumed unless stated specifically in reference reports (i.e. feasibility reports).

The proposed projects by time frame and estimated cost can be found in ***Appendix D.***

5.3.3 Monitoring

Monitoring remains as documented in the 2020 TMP Update.

APPENDIX A
Public Consultation - Updated



Notice of Addendum
Water, Wastewater, and Stormwater Master Servicing Plan Update 2051 Amendment and Transportation Master Plan Update 2051 Addendum

The City's 2020 Master Servicing Plan Update and 2020 Transportation Master Plan Update were completed to accommodate the 2041 growth scenario in line with Amendment 2 of the Province's A Place to Grow: Growth Plan for the Greater Golden Horseshoe. However, in the summer of 2020 the Province provided revised growth projections including a forecast growth horizon to 2051.

The 2020 Master Servicing Plan Update and Transportation Master Plan Update were finalized in January 2021 and addressed growth needs to the 2041 growth horizon. To accommodate the new 2051 growth horizon provided by the Province, the Master Servicing Plan Update – 2051 Amendment (MSP) and Transportation Master Plan Update – 2051 Addendum (TMP) are being completed.

Master Servicing Plan Update – 2051 Amendment

The objective of the City's 2020 Master Servicing Plan Update was to develop a comprehensive plan that incorporated all facets of the management, expansion, and funding of the water, wastewater, and stormwater systems for the entire city, including servicing of the Boundary Expansion Lands, to the year 2041. The objective of the Master Servicing Plan Update – 2051 Amendment study is to review and update the 2020 Master Servicing Plan Update to ensure that the recommendations meet the needs to the revised 2051 growth horizon.

Transportation Master Plan Update – 2051 Addendum

The objective of the City's 2020 Transportation Master Plan Update was to develop a balanced strategy for the servicing and operation of important transportation infrastructure within the entire City, including the Boundary Expansion Lands, to the year 2041. The objective of the Transportation Master Plan Update – 2051 Addendum study is to review and update the 2020 Transportation Master Plan Update to ensure that the recommendations meet the needs to the revised 2051 growth horizon.

The MSP Amendment and TMP Addendum are being completed as separate Environmental Assessment (EA) studies in accordance with the requirements of the Municipal Engineers Association (MEA) Class Environmental Assessment process for master planning (MEA, June 2000, as amended in 2007, 2011, 2015 and 2020). The studies are being undertaken based on Phases 1 and 2 of the Class EA processes for Master Plans.

We Want to Hear from You!
These studies are now initiating the 45-day public review period. Copies of the MSP and TMP Study Reports will be available for public review at the City's website (link below). The Study Reports will be available for review and comments for a 45-day period, beginning on **June 17, 2021** and ending **August 3, 2021**.

www.brantford.ca/MasterServicingPlan
www.brantford.ca/TransportationMasterPlan

During this period, the public is encouraged to review the final reports and provide comments to the study's Project Managers listed below. If you have any questions or comments, or wish to obtain more information, please contact:

Master Servicing Plan
Julien Bell, P.Eng.
Consultant Project Manager
GM BluePlan
330 Trillium Drive, Unit D
Kitchener, ON N2E 3J2
Phone: 519-748-1440 ext. 4264
Email:julien.bell@gmblueplan.ca

Sharon Anderson, P.Eng.
MSP Project Manager
100 Wellington Square
Brantford, ON N3T 2M2
Phone: 519-759-4150 ext. 5412
Email: andersonsh@brantford.ca

Transportation Master Plan
Paul Bumstead, B.E.S.
Consultant Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard Suite 800
Toronto ON M2J 4Y8
Phone: 905-260-4887
Email: pbumstead@dillon.ca

Sharon Anderson, P.Eng.
TMP Project Manager
100 Wellington Square
Brantford, ON N3T 2M2
Phone: 519-759-4150 ext. 5412
Email: andersonsh@brantford.ca

If these comments or concerns cannot be resolved through discussions with the City, a person or party may submit an order request to the Ministry of the Environment, Conservation and Parks, requesting a higher level of study or conditions be imposed.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statement in the request. This will ensure that the ministry is able to efficiently begin reviewing the request. The request should be submitted on provincial form *012-2206E Part II Order* sent in writing, or by email, to both:

Minister
Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th floor
Toronto, ON M7A 2T5
Minister.mecp@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. West, 1st Floor
Toronto, ON M4V 1P5
EABDirector@ontario.ca

Requests should also be sent to the City representatives by mail or by e-mail.

Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

JOIN THE CONVERSATION

facebook.com/CityofBrantford
@CityofBrantford

From: [redacted]
Sent: Thursday, July 15, 2021 9:15 AM
To: Sharon E. Anderson
Cc: [redacted]
Subject: RE: Brantford - Notice of Addendum and 45 day review period - Transportation Master Plan Update: 2051 Addendum

Sharon;

Further to our telephone conversation, there still seem to be some reluctance to totally embrace the new roundabout policy.

As mentioned, I reviewed the 2020 BRANTFORD TRANSPORTATION MASTER PLAN UPDATE March 2021 and the draft 2051 Addendum.

2020 BRANTFORD TRANSPORTATION MASTER PLAN UPDATE March 2021

a. **Section 3.4.5.2 – p.62**. I was pleased that the document recognized the importance of roundabouts

Comment - However I was quite surprised that on p.63 regarding the Objective of Roundabouts. "Roundabouts should be considered the default intersection control for new developments unless all way stop or signal control is proven to be a superior choice, particularly at two-lane road intersections."

Why would these two restrictive comments be made. They could have the effect of limiting (biasing) the use of roundabouts to new and two lane intersections?
Roundabouts should be considered for both redevelopment for existing intersections and multiple lane road intersections. In my opinion, a perfect example of an intersection that should have been a roundabout, was the recently redeveloped Terrace Hill / Paris Road intersection. A roundabout at this location would have been much safer and moved traffic more efficiently.

b. **Section 5.3.2.2 on p. 58 reads**:

There are typically four reasons for implementing roundabouts, which answer the question "What are we trying to achieve with roundabout implementation?":

- Improve Operations – reduce delay for high volume turning movements
- Traffic Calming – reduce speed
- Improve Safety – reduce conflicts
- Gateway – visual cue re: changing environment

Comment: surely this section needs to include "Lifetime Cost" of a roundabout vs. a signalized intersection. According to an example provided by the Transportation Association of Canada, a reconfigured signalized intersection costs $1.2 million to construct, with a 20 year lifecycle cost of $9.3 million which includes costs for maintenance, collisions and congestion.
That costs compares to the capital cost of a roundabout at $1.6 million with a 20 year life cycle cost of $5.3 million.
So a 20 year signalized intersections 20 year lifetime total is $10.5 million and a roundabouts is $6.9 million.
That is a saving of $3.6 million tax dollars.

Addendum 2051

a. I believe that sections 3.4.1.4 Crossings, 3.4.2 Cycling, 3.4.2.7 Crossroads and 3.4.3.3 Stops indicate that these sections "remain as documented in the 2020 TMP Update".

Comment: All of these sections either need to be updated to include roundabout examples or the 2041 March update needs to be modified. Perhaps there are also other sections that need updating to be more inclusive of roundabouts.

b. Table 5.6 : Road Infrastructure Recommendations by Time Frame
This table indicates the cost for the improvements for various road work. I speculate that when many of these roads are modified from their current configurations, intersections would need to be modified.

Comment: To provide future direction, where roundabouts are a possibility, should the chart not compare the lifetime cost of a signalized intersection with a roundabout.

Finally, recently the Mayor stated we should be developing our future transportation needs jointly with the County. Has County staff been specifically asked to comment on these documents?

Regards
[redacted]

From: Sharon E. Anderson
Sent: Thursday, July 29, 2021 5:10 PM
To: [redacted]
Cc: [redacted]
Subject: RE: Brantford - Notice of Addendum and 45 day review period - Transportation Master Plan Update: 2051 Addendum

Mr. [redacted],

Thank you for submitting your comments to the City's Transportation Master Plan (TMP) – 2051 Amendment, they will be included in the project record.

I have discussed your comments with the TMP project team and the group response is as follows. The text in bold is a summary of your question followed by the response in un-bolded text.

1. **Section 3.4.5.2 wording concerns and reference to Terrace Hill/Paris Road Intersection**
   a. The wording identified in quotes has been taken directly from the objectives section of the Public Works 022 – Roundabout Installation Policy approved by City Council on September 22, 2020. Which reads:
      i. Roundabouts should be considered the default intersection control for new developments unless all way stop or signal control is proven to be a superior choice, particularly at 2 lane road intersections. As such, the goal of this policy is to develop a set of procedures to screen and assess whether subject intersections should be roundabout controlled:
         1. define a roundabout and its core elements, in comparison to other types of circular intersections;
         2. discuss principles of considerations (advantages vs disadvantages);
         3. lay out the initiation, planning (screening and assessment phases), review and approval process.

   b. The wording in the policy is meant to express the City's expectation that moving forward for new intersections roundabouts will be the first choice for intersection control. An intersection control study would need to be undertaken on a case by case basis to determine if the roundabout is viable from a design perspective and preferred from an operational perspective. This does not mean that roundabouts will not be considered at existing intersections. Not all intersections will be converted to roundabout control but at such time as an intersection's operation is impacted by development or growth results in diminished operation and safety, then the same intersection control study would be undertaken to confirm the appropriateness of implementing roundabout control.

   c. The Transportation Master Plan is a strategic document addressing the long term system wide needs. It is appropriate to acknowledge that there are policies that govern this future potential, but it is not expected that the TMP make recommendations on operational issues and existing locations. Such scope would be addressed by City staff on a case by case basis.

   d. In regards to the provided example of Terrace Hill/Paris Road Intersection, the work on this intersection was completed prior to the approval of the Roundabout Policy. The modifications to this intersection were approved through an Environmental Assessment which was completed in November 2009. The first stage of this project, completed in 2019, included re-configuration of the intersection at Terrace Hill to be compatible with the proposed installation of a signal controlled pedestrian crossing that was the preferred plan from the Environmental Assessment. The pedestrian crossing will be installed with the completion of the bridge modifications and changes to the sidewalk.

2. **Section 5.3.2.2 Lifetime Cost calculation**
   a. The commentary provided in Section 5.3.2.2 related to roundabouts is meant to align potential roundabout implementation locations with the recommended Transportation System Management. It is not an assessment or evaluation that confirms that a roundabout is the preferred or recommended solution over traditional intersection control. As stated above, a more

detailed assessment (Intersection Control Study) is required. That study would include a range of evaluation criteria, including the capital and lifecycle costs assessment.

b. With regard to lifecycle cost considerations, local conditions can have a significant effect on the capital cost in the example identified. Local conditions with feasibility and/or cost impacts can include: property impacts, mitigation of impacts to environmental constraints, constructability of roundabout implementation regardless of potential cost and safety conditions (e.g. proximity to rail and other infrastructure may be improved or worsened by a roundabout). These would be addressed as part of more detailed future studies and are not within the scope of the TMP.

3. Sections 3.4.1.4, 3.4.2, 3.4.2.7 and 3.4.3.3 Roundabout Examples in the 2051 or 2041 document.

a. The 2041 document is complete, no revisions can be made to that document. For the 2051 Addendum document, as previously discussed, Section 3.4.5.2 Intersections will be updated to include graphics related to roundabout design and operation, including cycling and pedestrian treatment. The other sections listed will not be updated as they provide a description of the design element with generic examples along a corridor or at an intersection.

4. Table 5.6 Road Infrastructure Recommendations should this not include lifetime cost comparisons for intersections.

a. It is confirmed that intersection design elements along an improved corridor will need to be modified. The costs identified in the TMP are strategic costs based on benchmark unit costs for infrastructure. Intersection control costs are included. Traditional intersection control costs were applied as roundabout capital costs can vary significantly depending on the location (greenfield to retrofit) and property requirements (size and location of roundabout). As stated above, a more detailed assessment (Intersection Control Study) is required to confirm roundabout implementation and that study would include a range of evaluation criteria, including the capital and lifecycle costs assessment.

5. Have County staff been specifically asked to comment on these documents?

a. The County was invited to participate in the consultation events and review project material. Meetings were held in August and October 2020 with the County to discuss the outcomes of the TMP and issues that would need to be addressed in a Joint Study. At that time City and County staff created a plan to complete the Joint Study by Q3 2021. Unfortunately resources were not available to continue the work starting from November 2020 and the County began work on their Transportation Master Plan. Work on the Joint Study is expected to begin again once resources are available, this is currently estimated to be Q4 2021.

The new roundabout examples will be included with the final TMP – 2051 Amendment document which will be issued after the 45 day Public Review Period has closed and all comments received have been reviewed and accommodated where possible.

Should you have any further questions please let me know.

Regards
Sharon

Sharon Anderson, P.Eng.
Supervisor of Asset Management

City of Brantford – Public Works Commission
Engineering Services
58 Dalhousie St, Brantford, Ontario N3T 2J2
p: 519.759.4150 x5412 | f: 519.754.0724 | w: www.brantford.ca

Leo F. Longo
Direct: 416.865.7778
E-mail: mhelfand@airdberlis.com

July 28, 2021

VIA EMAIL: andersonsh@brantford.ca

Sharon Anderson, P.Eng.
MSP Project Manager / TMP Project Manager
City of Brantford,
100 Wellington Square,
Brantford, Ontario
N3T 2M2

Dear Ms. Anderson:

Re: Transportation Master Plan – 2051 Addendum

Aird & Berlis LLP are lawyers for the owners of lands municipally known as 218 Powerline Road, Brantford.

Further to our previous comment letter, dated January 2, 2021, we appreciate the opportunity to provide further commentary in respect of the Transportation Master Plan 2051 Addendum ("**TMP Addendum**").

218 Powerline Road has a frontage of 311 metres along Powerline Road. Powerline Road is described as a Major Arterial which, under the TMP Addendum, is proposed to be widened to 4 lanes throughout most of the City by 2030. The TMP Addendum identifies Powerline Road with good capacity conditions to 2051 under the future "Do Minimal" screenline summary. The TMP Addendum provides no indication that the residential development of 218 Powerline Road would introduce any undue capacity constraints on Powerline Road, or the broader road network.

Moreover, the TMP continues to recognize the importance of connected and continuous communities in order to support active transportation. The Active Transportation Plan elements included in the 2020 Transportation Master Plan Update are unchanged in the TMP Addendum. Given that 218 Powerline Road is surrounded by existing and future Community Area lands, 218 Powerline Road could easily be integrated into the City's proposed Active Transportation Network.

Accordingly, it continues to be our position that the 218 Powerline Road lands could be developed with its subdivision local roads connecting to Powerline Road, and/or, where appropriate, to the existing Brantwood Park residential subdivision to the west. The TMP Addendum reinforces that the development of 218 Powerline Road could occur with minimal to no disruption to the City's planned transportation framework.

If you have any questions please do not hesitate to contact the undersigned.

Yours truly,

AIRD & BERLIS LLP

Leo F. Longo
Partner
LFL/MH

Cc. Peter Van Loan (Aird & Berlis LLP)
Jay Hitchon (Waterous Holden Amey Hitchon LLP)
Client

THE CORPORATION OF THE CITY OF BRANTFORD
PUBLIC WORKS

Leo Longo
Aird Berlis LLP
181 Bay Street, Suite 1800
Toronto, Canada
M5J 2T9

September 10, 2021

Dear Mr. Longo,

Subject Line: Transportation Master Plan 2051 Addendum

Thank you for your interest in the City's Transportation Master Plan – 2051 Addendum and your comments as they relate to 218 Powerline Road.

Further to your letter dated July 28, 2021, we would like to state that it is not within the scope or the authority of the Transportation Master Plan (TMP) to make changes to the City's Official Plan or to make recommendations on the City's land use designations and/or the re-designation of lands. Please note that the Ministry of Municipal Affairs and Housing approved the new City of Brantford Official Plan, Envisioning Our City: 2051, with modifications, effective August 5, 2021.

Notwithstanding the above we would like to provide the following comments related to your comment that the 218 Powerline Road lands could be developed with its subdivision local roads connecting to Powerline Road, and/or, where appropriate to the existing Brantwood Park residential subdivision to the west:

- 218 Powerline Road is not within the Settlement Area Boundary delineated in the new, approved Official Plan. It is not within a block of the City identified as part of the preferred land use scenario in the Official Plan Municipal Comprehensive Review and therefore the transportation requirements for this block have not been included in the future 2051 condition. The TMP is a strategic assessment of the arterial and major collector road needs. Local roads, related to the development of land use blocks, are not within the scope of the TMP.
- However, it is noted that to preserve the function of a major arterial, direct subdivision local road connections to Powerline Road, as described in your comment, would not be desirable. At this time it is unclear where connections to the existing Brantwood Park residential subdivision could be made without significant impacts to the existing neighbourhood. The assessment of such local road needs and connections would need to be the subject of a more detailed

traffic study as part of a future Block Plan process for the block containing 218 Powerline Road. A future Block Plan process would occur only after the lands are added to the Settlement Area and re-designated for urban uses through an Official Plan amendment.

If you have any other questions or require additional information please feel free to contact the undersigned.

Mike Abraham
Manager of Infrastructure Planning

Gary Peever
Manager of Development Engineering

CC:
Matthew Helfand, Aird Berlis
Terry Patterson, Aird Berlis
Peter Van Loan, Aird Berlis
Jay Hitchon, Waterous Holden Amey Hitchon
Paul Bumstead, Dillon Consulting
Alan Waterfield, City of Brantford
Steve Dyjach, City of Brantford
Sharon Anderson, City of Brantford
Russ Loukes, City of Brantford
Nicole Wilmot, City of Brantford

From: Del Villar Cuicas, Joan (MECP) [mailto:Joan.DelVillarCuicas@ontario.ca]
Sent: Tuesday, August 3, 2021 9:10 PM
To: Sharon E. Anderson
Cc: Potter, Katy (MECP)
Subject: RE: Brantford - Notice of Addendum and 45 day review period - Master Servicing Plan Update: 2051 Amendment and Transportation Master Plan Update: 2051 Addendum

Hello Sharon,
Thank you for circulating the City of Brantford Master Servicing Plan Update: 2051 Amendment and Transportation Master Plan Update" 2051 Addendum for review and the opportunity to comment.

We would like to offer the following comments for your consideration:

1. There is a discrepancy in the Transportation Master Plan. Section 1.3 (Study Approach) indicates that this EA follows Master Planning Approach #1, however, Section 1.2 (Study Objectives), Item 3, indicates that this Master Plan will satisfy EA requirements for Schedule B undertakings.

2. The Notice of Addendum should reflect the changes made to the Environmental Assessment Act in July 2020, which resulted in a scoping of what grounds a s.16 order/Part II order request can be made on. Section 16(6) of the *Environmental Assessment Act* provides that a request for an order can be made only on the grounds that the order may prevent, mitigate, or remedy adverse impacts on existing Aboriginal and treaty rights of the Aboriginal peoples of Canada as recognized and affirmed in section 35 of the Constitution Act, 1982.

3. The appropriated Indigenous communities have been notified, however there was not indication that these communities were provided sufficient opportunity to be made aware of the amendment and addendum. Any efforts of follow- up (emails/phone calls) by the proponent should be documented in the record of consultation that accompanies the Class EA documentation.

Should you or any members of your project team have any questions regarding the material above, please contact me.

Regards,

Joan Del Villar Cuicas
Regional Environmental Planner
Project Review Unit | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
Joan.delvillarcuicas@ontario.ca | Phone: 365-889-1180

From: **Sharon E. Anderson** <andersonsh@brantford.ca>
Date: Wed, 8 Sept 2021 at 14:13
Subject: RE: Brantford - Notice of Addendum and 45 day review period - Master Servicing Plan Update: 2051 Amendment and Transportation Master Plan Update: 2051 Addendum
To: Del Villar Cuicas, Joan (MECP) <Joan.DelVillarCuicas@ontario.ca>
Cc: Potter, Katy (MECP) <Katy.Potter@ontario.ca>, Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>, Alyssa Kochanski - GM BluePlan <Alyssa.Kochanski@gmblueplan.ca>, Bumstead, Paul <pbumstead@dillon.ca>

Hello Joan,

Thank you for the Ministry of Environment, Conservation and Parks' comments as they relate to the City's Master Servicing Plan Update: 2051 Amendment and Transportation Master Plan: 2051 Addendum.

Further to your email dated August 3rd, 2021 I would like to provide the following responses:

1. Your first comment is related to the Transportation Master Plan and is not applicable to the Master Servicing Plan. That said, it is acknowledge that the text identified in Section 1.2 Item 3 is somewhat misleading as it relates to Schedule B projects. The Project Summary, Section 1.2 and Section 1.3 text in the TMP Executive Summary and main text will be updated to provide specific detail contained within the MCEA as it relates to the Master Plan Process and what it specifically means for Schedule B and C projects. Text will also be added to identify whose responsibility it will be for completing the technical analysis required for the Project File for the Schedule B projects.

2. The City will coordinate internally to ensure that future notice language appropriately reflects the highlighted changes to the EAA.

3. Minutes of meetings held with the Six Nations of the Grand River have been included in Volume 6 of the Master Servicing Plan Update: 2051 Amendment. Additional logs of phone conversations with various community representatives will be added to Volume 6 prior to finalization.

Regards
Sharon

Sharon Anderson, P.Eng.
Supervisor of Asset Management

City of Brantford – Public Works Commission
Engineering Services
58 Dalhousie St, Brantford, Ontario N3T 2J2
p: 519.759.4150 x5412 | f: 519.754.0724 | w: www.brantford.ca

Ministry of Heritage, Sport, Tourism and Cultural Industries

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 613.242.3743

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 613.242.3743

Ontario

August 3, 2021 EMAIL ONLY

Paul Bumstead, B.E.S.
Consultant Project Manager
Dillon Consulting Ltd.
235 Yorkland Boulavard, Suite 800
Toronto, ON M2J 4Y8
pbumstead@dillon.ca

MHSTCI File : 0012024
Proponent : The City of Brantford
Subject : Notice of Addendum – Municipal Class EA
Project : Transportation Master Plan Update - 2051
Location : Brantford

Dear Paul Bumstead:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the above referenced notice and the Transportation Master Plan Update – 2051 completed by Dillon Consulting (dated, June 2021). MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage.

Project Summary
The objective of the Transportation Master Plan Update – 2051 Addendum study is to review and update the 2020 Transportation Master Plan Update to ensure that the recommendations meet the needs to the revised 2051 growth horizon. The TMP Addendum is being completed as an Environmental Assessment (EA) study in accordance with the requirements of the Municipal Engineers Association (MEA) Class Environmental Assessment process for master planning (MEA, June 2000, as amended in 2007, 2011, 2015 and 2020). The studies are being undertaken based on Phases 1 and 2 of the Class EA processes for Master Plans.

Project Comments
Section 1.3 (Study Approach) indicates that this EA follows Master Planning Approach #1, however, Section 1.2 (Study Objectives), Item 3, indicates that this Master Plan will satisfy EA requirements for Schedule B undertakings. Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Archaeological Resources
This EA project may impact archaeological resources, any individual Schedule B MCEA undertakings proceeding as part of the master plan should be screened using the MHSTCI *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at *archaeology@ontario.ca*. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MHSTCI for review.

Built Heritage Resources and Cultural Heritage Landscapes
Any individual Schedule B MCEA undertakings proceeding as part of this master plan should be screened for impacts to cultural heritage resources using the MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*. Where potential or known heritage resources exist, MHSTCI recommends a Heritage Impact Assessment (HIA), prepared by a qualified consultant, be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send HIAs to MHSTCI for review, and making them available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
Technical cultural heritage studies are to be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed. Technical cultural heritage studies should be completed prior to the completion of the Master plan to inform the selections and design of preferred alternatives Please provide MHSTCI with any technical cultural heritage studies completed for this master plan prior to detailed design.

Thank you for consulting MHSTCI on this project. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Joseph Harvey
Heritage Planner
Heritage Planning Unit
joseph.harvey@Ontario.ca

Copied to: Sharon Anderson, TMP Project Manager, City of Brantford
Joan Del Villar Cuicas, Environmental Resource Planner & EA Coordinator, MECP

September 24, 2021

Sent via Electronic Mail

Ministry of Heritage, Sport, Tourism and Cultural Industries
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON
M7A 0A7

Attention: Joseph Harvey, Heritage Planner
Heritage Planning Unit
joseph.harvey@Ontario.ca

Re: City of Brantford - Transportation Master Plan Update - 2051– Notice of Addendum – Municipal Class EA - Response

Dear Joseph:

Thank you for your interest in the City's Transportation Master Plan – 2051 Addendum and your comments of August 3, 2021 as they relate to the MHSTCI's mandate to conserve Ontario's cultural heritage.

The Project Team confirms that the EA follows Master Planning Approach #1. As stated in Appendix 4 of the Municipal Class EA (MCEA) manual:

> *"This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process. The Master Plan document would be made available for public comment prior to being approved by the municipality. Typically, the Master Plan would be done at a broad level of assessment thereby requiring more detailed investigations at the project-specific level in order to fulfil the Municipal Class EA documentation requirements for the specific Schedule B and C projects identified within the Master Plan*
>
> *The Master Plan would therefore become the basis for, and be used in support of, future investigations for the specific Schedule B and C projects identified within it. Schedule B projects would require the filing of the Project file for public review while Schedule C projects would have to fulfil Phases 3 and 4 prior to filing an Environmental Study Report (ESR) for public review."*

…cont'd

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Dillon Consulting Limited

With this in mind, we note that the text identified in Section 1.2, Item 3 is incomplete and somewhat misleading as it relates to Schedule B projects. Additional text is required that outlines that while the planning phase of the Schedule B project is complete at the end of Phase 2 (completion of the Master Plan), a Project File is required to be opened that not only documents the problems and alternatives to but also includes commitments to undertake other detailed technical analysis and studies as required, including a project's potential impact on cultural heritage resources. Beyond the Master Plan task completed the Project File is to include:

- a description / inventory of the environment;
- the alternative solutions considered and the evaluation;
- process followed to select the preferred solution; and
- follow-up commitments, including any monitoring necessary. The technical analysis and studies would be undertaken as part of the design process for the development area by the developer.

Section 1.2 and Section 1.3 text in the TMP 2050 Addendum be updated to provide specific detail contained within the MCEA as it relates to Master Plan Process and what it specifically means for Schedule B and C projects. Text will also be added to identify whose responsibility it will be for completing the technical analysis required for the Project File for the Schedule B projects.

…cont'd

If you have any other questions or require additional information at pbumstead@dillon.ca or 1-905-260-4887.

Yours sincerely,

DILLON CONSULTING LIMITED

Paul Bumstead, B.E.S.
Senior Consultant

PB:pb

From: **Harvey, Joseph (MHSTCI)** <Joseph.Harvey@ontario.ca>
Date: Mon, 18 Oct 2021 at 16:28
Subject: RE: Files 0012024: Brantford - Notice of Addendum and 45 day review period - Transportation Master Plan Update: 2051 Addendum
To: Bumstead, Paul <pbumstead@dillon.ca>
Cc: andersonsh@brantford.ca <andersonsh@brantford.ca>, Barboza, Karla (MHSTCI) <Karla.Barboza@ontario.ca>, Del Villar Cuicas, Joan (MECP) <Joan.DelVillarCuicas@ontario.ca>

Hi Paul,

Thank you for your response and please accept my apologies for the late response. Thanks for confirming this EA follows Master Planning Approach 1. As indicated in your letter, Appendix 4 of the Municipal Class EA (MCEA) manual notes that, for Master Plans proceeding according to Master Planning Approach 1, all identified Schedule B and C MCEA projects require the filing of a EA project file report for public review.

The letter also states that “Section 1.2 and Section 1.3 text in the TMP 2050 Addendum be updated to provide specific detail contained within the MCEA as it relates to Master Plan Process and what it specifically means for Schedule B and C projects. Text will also be added to identify whose responsibility it will be for completing the technical analysis required for the Project File for the Schedule B projects.” We would appreciate if you could send the updated Addendum document for our records.

Thank you for consulting with MSHTCI. Please do not hesitate to contact me if you have any further questions or concerns

Joseph Harvey | Heritage Planner
Heritage, Tourism and Culture Division | Programs and Services Branch | Heritage Planning Unit
Ministry of Heritage, Sport, Tourism and Culture Industries
613.242.3743
Joseph.Harvey@ontario.ca

Staff: Mike Abraham
Position: Manager of Infrastructure Planning
Project: Master Servicing Plan & Transportation Master Plan
Organization/Stakeholder: Six Nations of the Grand River (CAP Team), Mississaugas of the Credit First Nation

To:	Robin Linn (Vanstone)
Organization:	Six Nations of the Grand River
Date/Time:	August 18th, 2020 (3:00pm)
Discussion Topic:	Introduction as City Representative for Infrastructure Planning EAs
Summary of Discussion:	Introduced as project lead and contract for City EA projects related to Infrastructure Planning. Projects to include Master Servicing Plans, Transportation Master Plans, new road construction EAs, road widening EAs etc. Robin and I discussed and shared our backgrounds and experiences with EAs. Robin discussed Six Nations expectations with communication on City EAs and development projects. Robin discussed pasted agreements including the Haldimand Tract and the goal of her the Six Nations CAP team and as a Consultation Supervisor.
Action Items:	N/A
Notes:	1. Most of the discussion was around development projects. Robin expressed concern about not being consulted on development projects and not receiving appropriated documents from developers.

To:	Robin Linn (Vanstone)
Organization:	Six Nations of the Grand River
Date/Time:	January 29th, 2021 (9:30am)
Discussion Topic:	Updates on Master Servicing Plan
Summary of Discussion:	Discussed the purpose of the 2051 MSP amendment and asked if there were any additional questions regarding the 2041 MSP report that was sent to Robin and her team December 3rd, 2020 and/or previous MSP meeting on December 11th. Robin mentioned the poor circulation of development reports related to archaeological phases. Discussion around Oak Park Road and upcoming PIC meetings and concern about archaeological work, Tufa Mounds and any work around the river front of the Grand River. Discussed the possibility to site visit to view the Tufa Mounds.
Action Items:	N/A
Notes:	

To:	Robin Linn (Vanstone)
Organization:	Six Nations of the Grand River
Date/Time:	April 22nd, 2021
Discussion Topic:	Coordination of Master Servicing Plan Presentation & Next Steps
Summary of Discussion:	Discussed the upcoming meeting for the 2051 MSP amendment that city staff and the city's consultant will be present to answer any questions. Robin spoke to re-issuing the meeting invite due to staff changes within the Six Nations CAP Team.
Action Items:	1. Meeting invite via virtual re-issued
Notes:	N/A

To:	Robin Linn (Vanstone)
Organization:	Six Nations of the Grand River
Date/Time:	June 3th, 2021
Discussion Topic:	Environmental Assessment Updates
Summary of Discussion:	Primary discussion around City Council direction to pause OPRE EA. Discussed May's MSP/TMP presentations and if the SN CAP team had any additional questions. Next steps discussed ie. Public review period to start end of June with an anticipated final MSP/TMP for mid-Fall 2021.
Action Items:	
Notes:	N/A

To:	Fawn Sault
Organization:	Mississaugas of the Credit First Nation
Date/Time:	June 8th, 2021
Discussion Topic:	Environmental Assessment Updates
Summary of Discussion:	Primary discussion around City Council direction to pause OPRE EA. Minor discussion on 2051 MSP/TMP amendment (final completion date, public review period).
Action Items:	
Notes:	N/A

APPENDIX B

Bicycle Friendly Communities Workshop – Summary Report and Recommendations - No Change

APPENDIX C

Transportation Demand Forecasting Model - Updated

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Appendices

1.0 Introduction

In 2016, in preparation for the Transportation Master Plan Update, Dillon Consulting migrated the City's 4-step travel demand model from TransCAD to VISUM[1]. The purpose of this migration was to prepare the strategic model for potential next phase microsimulation[2] activities for Secondary Plan and Environmental Assessment study analysis. The migration included the update of population and employment data (existing and future) and the recalibration of the model using update count data. At the conclusion of the TMP activities, the strategic model will be migrated back to TransCAD as required.

This transportation planning model is a representation of the County of Brant and the City of Brantford transportation facilities and the travel patterns using these facilities with a focus on the City of Brantford. The model contains inventories of the existing roadway facilities and of land use and demographic data in the area. These inventories are used to calculate 'modeled traffic counts', which are compared with current 'existing traffic counts'. When the model matches the modeled and existing traffic counts within acceptable ranges of error, the model can then be used to test future year scenarios. These scenarios may be changes in population, employment, travel behavior patterns, or roadway improvements. The transportation engineer or planner, using the transportation planning model, can project future traffic volumes without the cost of building inappropriate roadways or waiting for traffic congestion to severely impact travelers.

This document details the methodology that was used to migrate the model. Because modeling is a complex process, much of the theory, terminology, and concepts are also discussed.

1.1 Scope of Work

The scope of the project included the following primary tasks:

- A complete migration of the existing TransCAD model to the VISUM platform;
- An update of the existing and future population and employment; and
- A recalibration of strategic screenlines for auto vehicles using updated traffic count data.

[1] VISUM is a Windows based multimodal transportation modeling software made by PTV Group.

[2] Microsimulation models simulate the behaviour of individual vehicles within a predefined road network and are used to predict the likely impact of changes in traffic patterns resulting from changes to traffic flow or from changes to the physical environment. Unlike conventional intersection capacity analysis tools (such as Synchro), microsimulation models consider vehicle and driver behavior theories, and vehicles can be influenced by other vehicles, pedestrians and bicycles, roadway grades, curves, and many other factors.

1.2 Model Foundations

While enhancements to the model content have been made, the foundational elements of model have not been changed as part of this migration process. Specifically the following has not been revisited:

- Trip Generation;
- Trip Distribution;
- Mode Share; and
- Assignment Processes.

The original TransCAD model utilised the 2006 Transportation Tomorrow Survey (TTS) to capture trip making patterns of City residents throughout a typical weekday. Since that model was developed, the results of both the 2011 and 2016 TTS surveys were released. To ensure the models foundational elements were still valid, the 2016 TTS data was comparted against the 2006 TTS data. This comparison confirmed that the models foundations were still relevant and as such the model should be considered reflective of the 2016 TTS.

The TTS survey remains as the cornerstone of the model. Its findings were primarily used in the development of the transportation model and include the identification of peak travel periods, the development of trip generation rates, the identification of travel mode share, the estimation of automobile occupancy, etc.

2.0 Model Refinement & Development

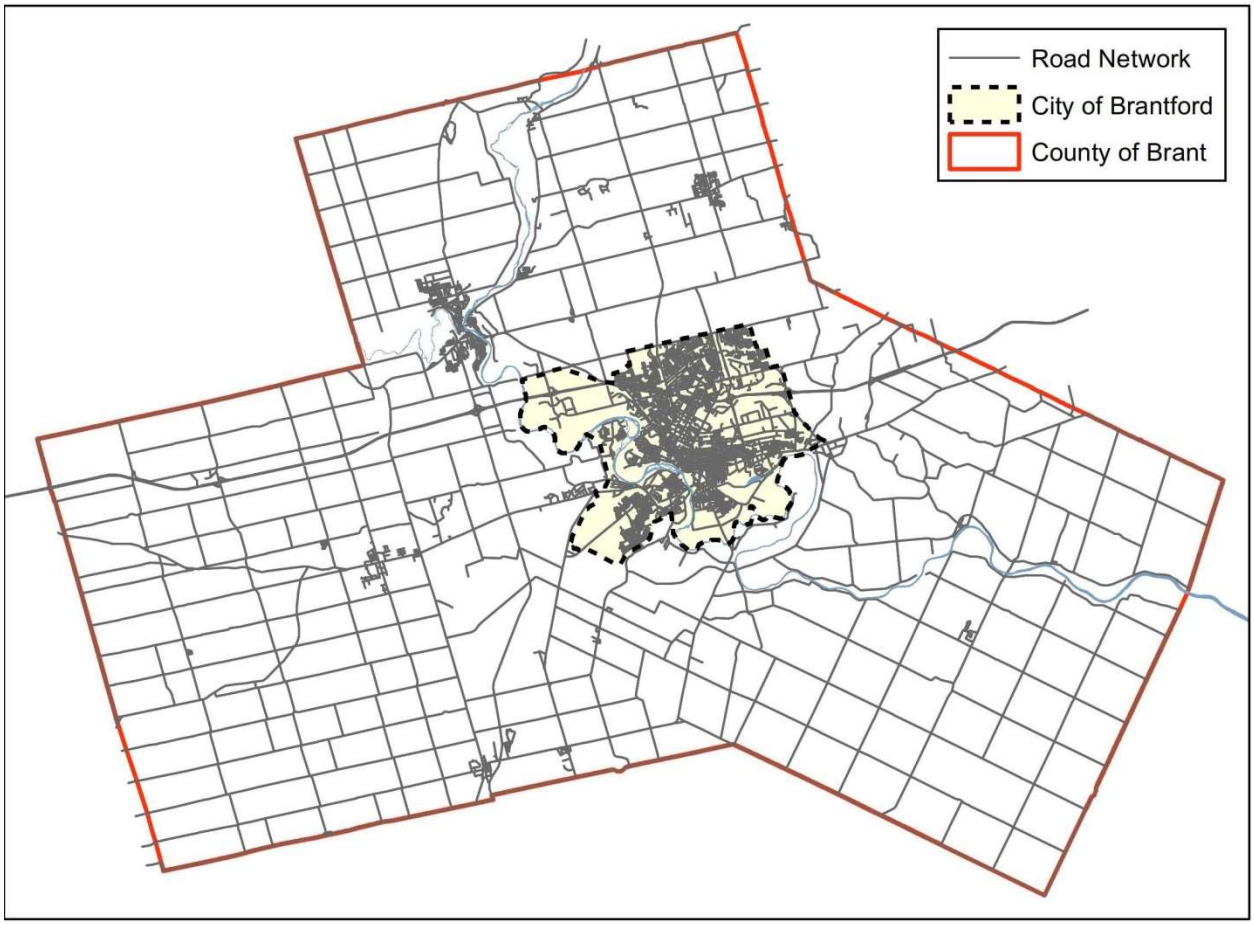
The Brantford model refinement and development involved the following items:

- Model Area;
- Transportation Network Enhancement; and
- Transportation Analysis Zones (TAZ).

2.1 Model Area

The modeling process begins with the identification of model area. In case of the Brantford model, the model contains the entire County of Brant and the City of Brantford. However, the main focus area of the model is the City of Brantford. ***Figure 1*** illustrates the model area, highlighting both the County of Brant and the City of Brantford.

Figure 1: Brantford Model Area



2.2 Transportation Network Enhancement

The road network in the transportation model is represented by a series of links and nodes, which reflect lines of travel and points where roadways intersect. Typically, links represent roadway segments and nodes represent intersections.

2.2.1 Road Links

The functional road classifications in the model are used to characterize each roadway based on how it operates and the role it serves in the transportation network. Functional road classifications were adapted from the previous TransCAD transportation model and disaggregated to allow different capacities for single road classification types with different speed limits. This method provides additional flexibility during calibration, as capacities can be modified to mimic actual operating conditions.

Each roadway link in the model was assigned a functional classification / speed (i.e., Link Type attribute in VISUM) and its directional number of lanes. Using VISUM's model run procedures (see ***Section 3.4***) the planning capacity in vehicles per hour (vph) was automatically calculated.

The planning capacities used in the model reflect free flow conditions at on a link for a given operating condition and influence the movement of traffic through the network. As an example, a typical arterial roadway has a saturation flow rate of 2200 vehicles per hour per lane (vphpl) of green time at a traffic signal. For a typical intersection of two major arterial roads, the strategic assumption is that the available green time is roughly split 50/50. After reducing the time required for the amber and all-red signal phases, approximately 41% of the available time within an hour is used for the green phase on each road. This translates to a planning capacity of 900 vphpl.

Roadways with a lower functional classification are assigned lower planning capacities to reflect the reduced flow rate due to lower priority at intersections with major roads.

The link types, functional road classifications, planning capacity, and speeds as coded in the model are defined in in ***Table 1***. The functional classifications for the roads within the County of Brant and the City of Brantford as coded in the VISUM model are shown and ***Figure 2*** and ***Figure 3***.

Table 1: Functional Road Classification, Speed Limit & Planning Capacity

Link Type Number	Functional Road Classification Name	Speed (km/h)	Planning Capacity Per Lane / Direction (vehicles / lane / hour)
11	Freeway	90 km/h	1500
12	Freeway	100 km/h	1800
15	Rural Highway	60 km/h	1000
16	Rural Highway	70 km/h	1100
17	Rural Highway	80 km/h	1200
18	Rural Highway	90 km/h	1300
21	Freeway Ramp	60 km/h	1000
22	Freeway Ramp	70 km/h	1100
23	Freeway Ramp	80 km/h	1200
31	Major Arterial	50 km/h	800
32	Major Arterial	60 km/h	900
33	Major Arterial	70 km/h	1000
34	Major Arterial	80 km/h	1100
41	Minor Arterial	50 km/h	700
42	Minor Arterial	60 km/h	800
43	Minor Arterial	70 km/h	900
44	Minor Arterial	80 km/h	1000
51	Major Collector	50 km/h	600
52	Major Collector	60 km/h	750
53	Major Collector	70 km/h	800
54	Major Collector	80 km/h	900
61	Minor Collector	50 km/h	500
62	Minor Collector	60 km/h	600
63	Minor Collector	70 km/h	700
64	Minor Collector	80 km/h	800
71	Local Road	30 km/h	350
72	Local Road	40 km/h	400
73	Local Road	50 km/h	500

Figure 2: Road Network / Classification – County of Brant

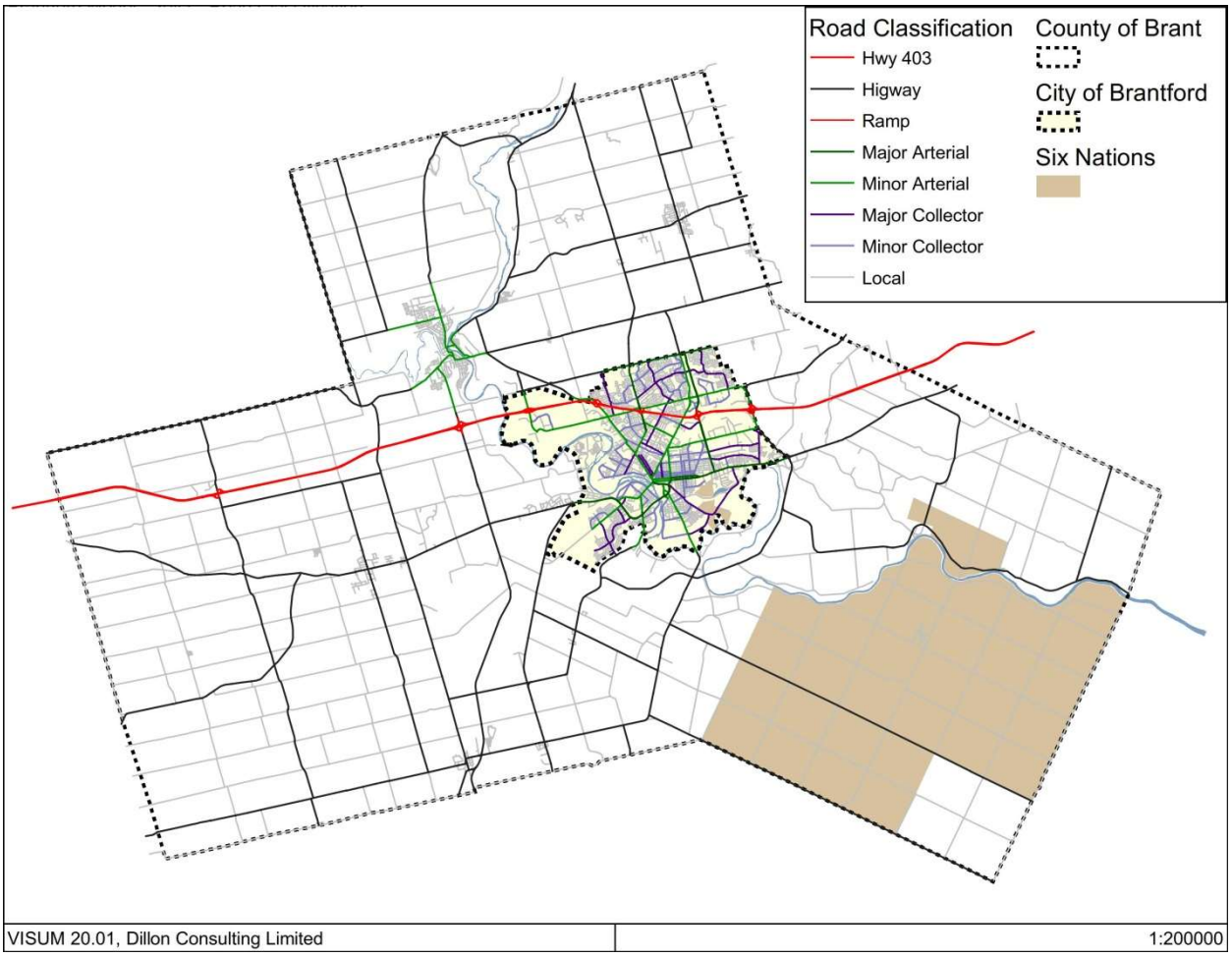
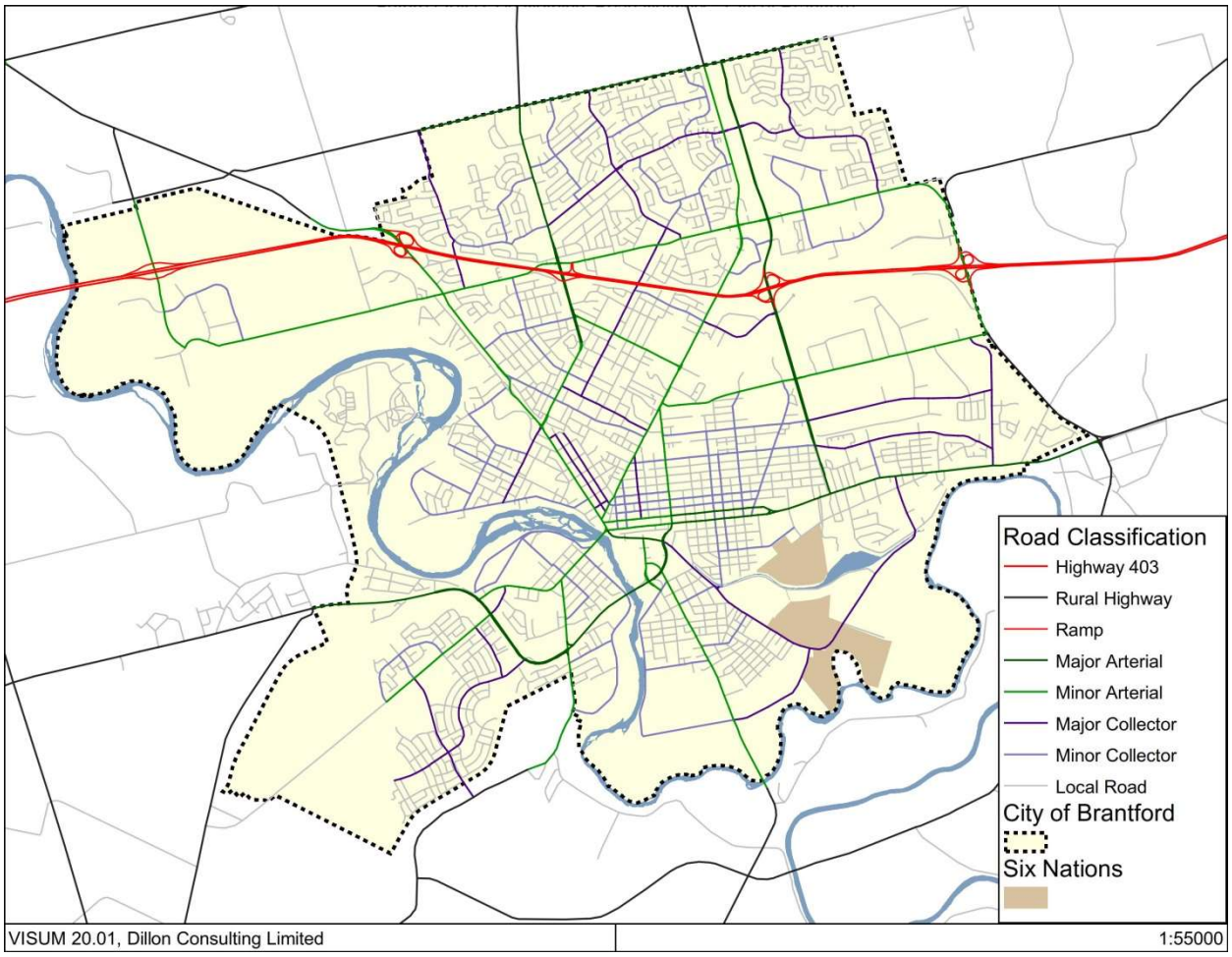


Figure 3: Road Network / Classification – City of Brantford



2.2.2 Volume Delay Function

Based on the road type, capacity, and posted speed, a volume-delay function (VDF) is used to describe how each road segment in the model behaves as traffic volumes increase. These functions are required by the Equilibrium Lohse assignment algorithm used by VISUM, for updating travel times in response to traffic volumes. As the volume using a road begins to approach the capacity of that road, the vehicle speeds will tend to drop and delays will increase the travel time on that route.

The Equilibrium Lohse assignment uses an iterative process where trips are assigned and re-assigned to the road network until the paths between specific TAZ pairs converge to a similar travel time (i.e., no traveler can improve their travel times by shifting routes) within a given threshold. The "loaded" travel times are determined by the VDF assigned to each link.

The link performance functions used are taken from the previous TransCAD model and are based on the Bureau of Public Roads (BPR) formulation, which is as follows:

$tc = tff\ (1+\alpha\ (v/c)^{ß})$

where: tc = travel time based on volume
tff= free flow travel time on the link
v = link volume
c = link capacity
α,β= calibrated link performance parameters

The α and β values are applied based on the functional classification for each of the different roadway types in the model, and are shown in ***Table 2*** below:

Table 2: Link Performance Functions Parameters by Roadway Type

Roadway Type	Parameters α	Parameters β
Freeway	0.72	6.14
Rural Highway	0.72	6.14
Freeway Ramp	0.72	6.14
Major Arterial	0.60	5.87
Minor Arterial	0.51	4.96
Major Collector	0.51	4.96
Minor Collector	0.51	4.96
Local Road	0.51	4.96

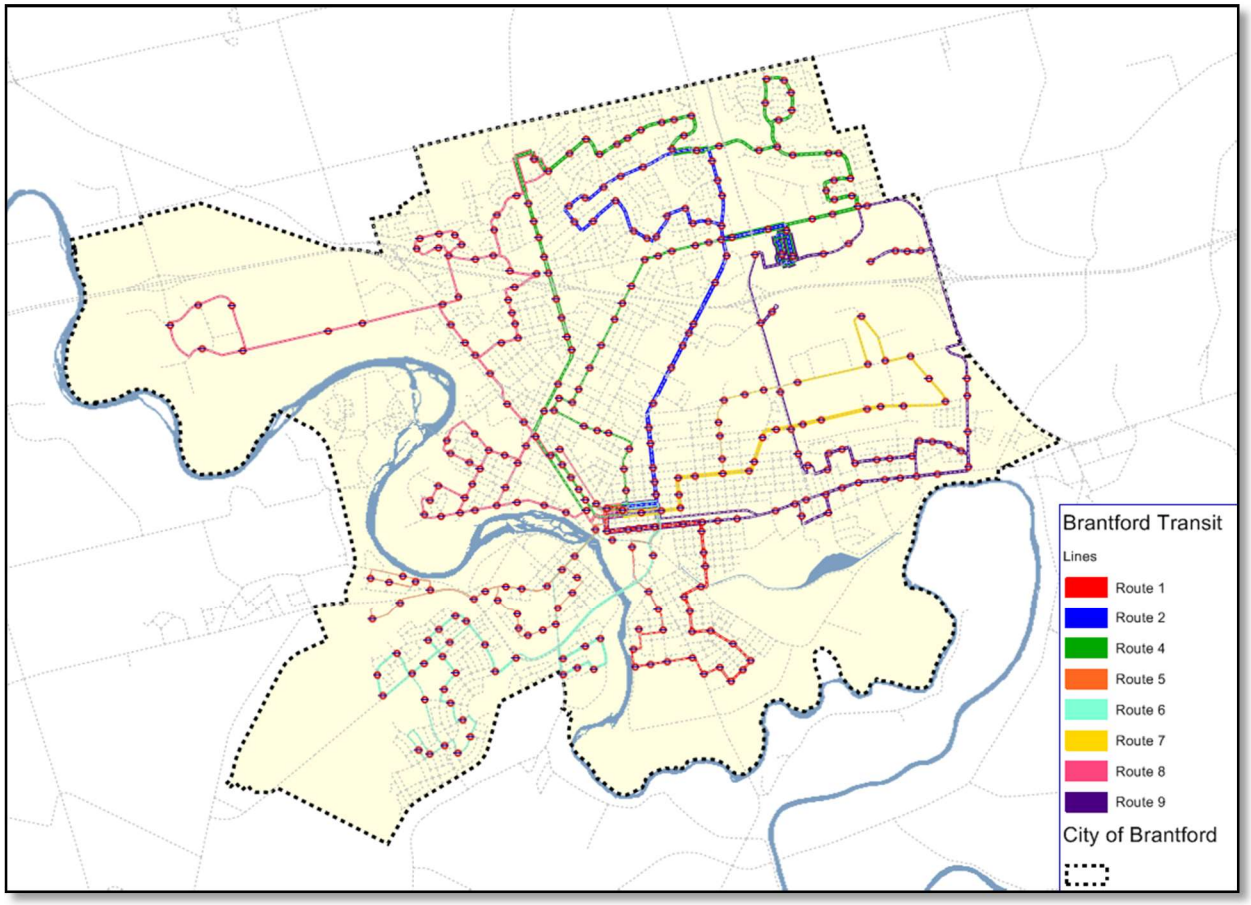
2.2.3 Transit Network

In addition to the model migration from TransCAD to VISUM, a basic transit enhancement was undertaken to allow transit person trips to be assigned along the road network, in addition to the basic automobile trip assignment. Using VISUM's native import function, the General Transit Feed Specification (GTFS) data for Brantford Transit was imported to the VISUM data format and merged with the transportation model. This included the following network objects:

- **Transit Stop Locations** – Point objects in the road network to allow for the boarding/alighting of person trips as the beginning, transfer, or end points of journeys.
- **Transit Route Paths** – Lines and line route objects along the road network where transit vehicles follow, servicing stop locations.

After the transit network was imported, detailed checks were made to ensure accuracy of the network. The resulting transit network is shown in ***Figure 4***.

Figure 4: Transit Network: Routes & Stop Locations



2.3 Transportation Analysis Zones (TAZ)

A transportation analysis zone (TAZ) is an area of geography used in conventional transportation planning models and is used to break down the city and region into a series of areas with similar land uses and travel patterns. The size and structure of the TAZ system has a definite impact on the degree of accuracy of the travel demand forecasting model.

The TAZ system for the Brantford TransCAD model contained 398 zones. This included 337 zones within the City of Brantford, 46 zones within Brant County and 15 external zones. The TAZ system from the previous model was maintained as there was no technical justification for alteration.

Figure 5 and ***Figure 6*** illustrate the traffic zone boundaries and the external traffic zones used in the model.

Figure 5: Transportation Analysis Zones – County of Brant

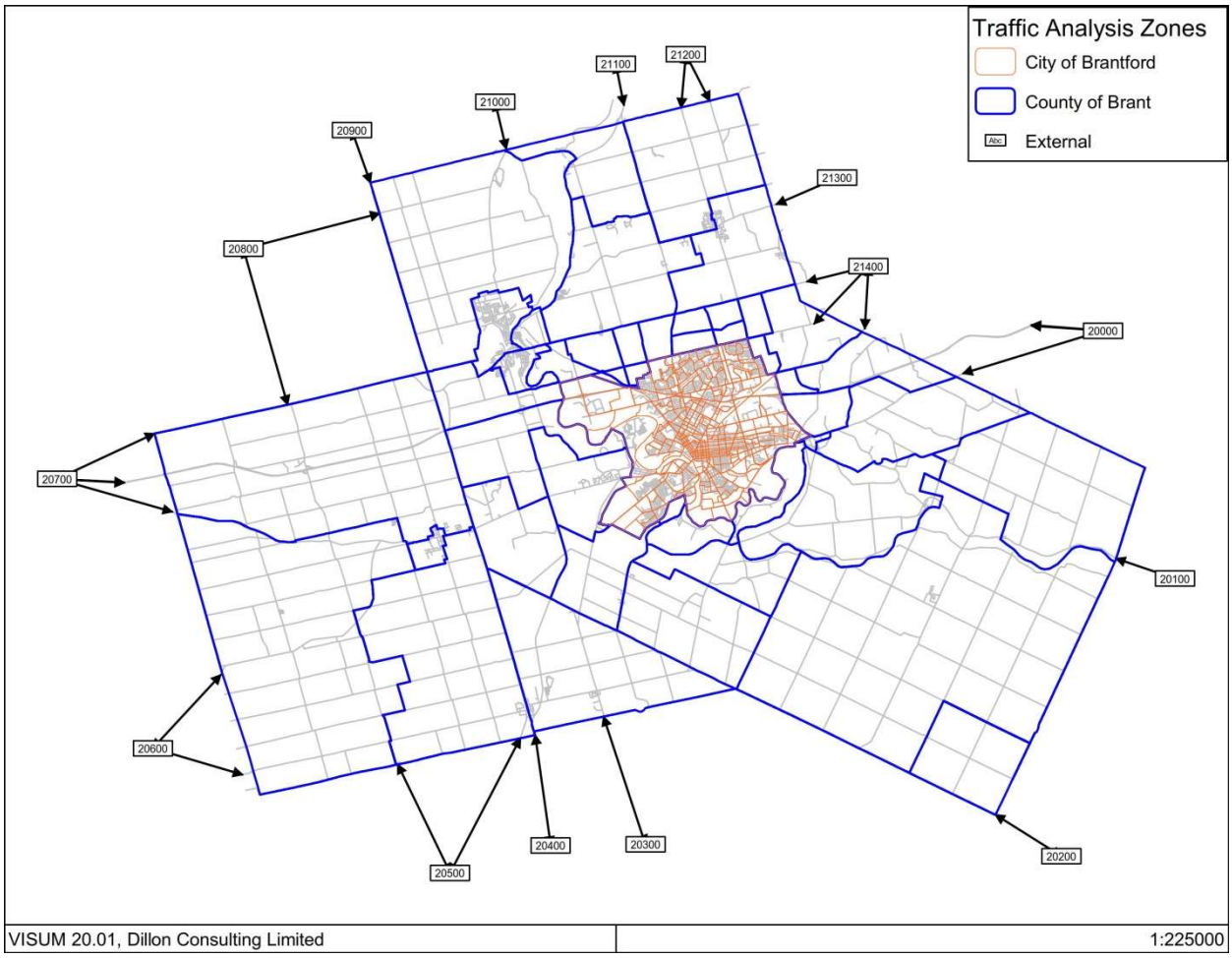
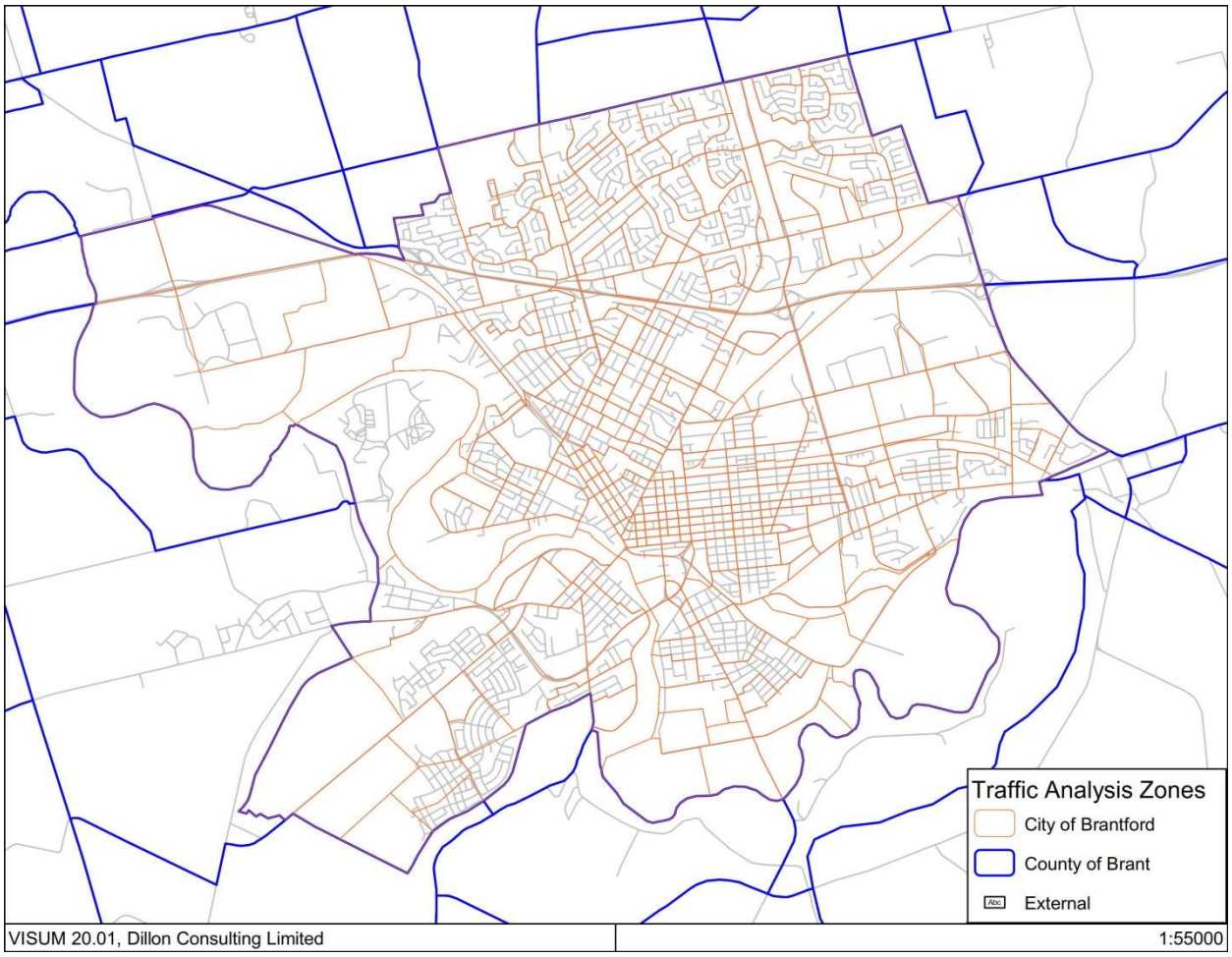


Figure 6: Transportation Analysis Zones – City of Brantford



2.3.1 TAZ Centroids and Connectors

The centroid for a TAZ is the location within a zone where all trips to/from that zone either starts or ends. Centroids are connected to the transportation network by a series of special links called connectors, which are representative links of potentially multiple streets or accesses that vehicles use to enter or exit the road network.

Connectors are usually laid out to try and emulate the loading pattern provided by the local street network, and often connect to minor intersections or local streets just upstream or downstream of a more major collector or arterial road. Trips are prohibited from using a centroid connector unless they originate or are destined to the zone.

The TAZ connectors were taken from the previous TransCAD model.

3.0 Model Approach

The 4-step travel demand model structure adopted in Visum is based on an aggregate modeling methodology which explicitly models homogeneously divided behavioral and socio-economic data aggregated at a zonal level. It involves the sequential execution of the 4 steps:

- Trip Generation;
- Trip Distribution;
- Mode Choice; and
- Trip Assignment

This procedure is consequently iterative and converges towards a solution, measured as the minimal transportation cost considering a given travel demand and characteristics of the transportation network.

3.1 Trip Generation

In a travel demand model, land use input is the key determinant in the generation of trips. The land use pattern of a particular area will have an influence on trips to/from TAZs within the area. Population and employment are used as the inputs to a TAZ area. Trip generation rates for specific land use types are applied to the TAZ level land use forecasts to estimate the trips generate by the TAZ (zonal productions and attractions). The land use data (population and employment) in the model was updated to a 2016 base year. It was provided by statistics Canada on a census tract level, this data was disaggregated by SGL Planning & Design Inc. to match the more refined TAZ level. The trip generation rates were carried forward from TransCAD to VISUM during the model migration process, as described below in this section. The model process for developing trip generation, and carried forward to the VISUM model, is described below.

Peak Period trip generation rates were developed from the 2006 Transpiration Tomorrow Survey (TTS) (and where confirmed by the 2016 TTS) for both the AM and PM peak periods. The AM peak period is defined as between 6:00 am to 9:00 am and the PM peak period is defined as between 3:00 pm to 6:00 pm, representing total person trips (independent of the mode of travel). Trip generation equations for both productions and attractions were formulated for four different trip purposes, including:

- Home-based work (HBW) trips, which include any trip with an origin or destination to or from home and work;
- Home Based Other (HBO) trips which include any non-work trips having an origin or destination to or from home;
- Non-home based (NHB) trips which have neither an origin nor destination to or from home; and

- Home-based school (HBS) trips which include any trips with an origin or destination to or from home and school.

Regression analysis was used to estimate the relevant variables used for each trip purpose as summarized in ***Table 3*** and ***Table 4***.

Table 3: Trip Generation Variables (AM Peak Period)

TRIP PURPOSE	AM								
	VARIABLES								
	TOTAL POP.	TOTAL EMP.	POP. SALES/ SERV	POP. PROF.	LABOR FORCE	EMP. OFFICE	EMP. PROF.	EMP. SALES/ SERV	EMP. MANUF.
HBW_P (Int –Int)					0.4870				
HBW_A (Int - Int)		0.5150							
HBW_P (Ext –Int)		Employment Growth Rate							
HBW_A (Ext - Int)	External Zone Population Growth Rate								
HBW_P (Int - Ext)	External Zone Population Growth Rate								
HBW_A (Int - Ext)		Employment Growth Rate							
HBO_P	0.1140								
HBO_A	0.0510						0.1170	0.3520	
NHB_P	0.0250						0.0600	0.1250	0.0900
NHB_A				0.0291			0.2910	0.0950	0.0212
HBS_P	Population Growth Rate								
HBS_A	N/A								

Table 4: Trip Generation Variables (PM Peak Period)

TRIP PURPOSE	PM								
	VARIABLES								
	TOTAL POP.	TOTAL EMP.	POP. SALES/ SERV	POP. PROF.	LABOR FORCE	EMP. OFFICE	EMP. PROF.	EMP. SALES/ SERV	EMP. MANUF.
HBW_P (Int –Int)						0.9450	0.5700	0.2000	0.4700
HBW_A (Int - Int)					0.4500				
HBW_P (Ext –Int)	External Zone Population Growth Rate								
HBW_A (Ext - Int)		Employment Growth Rate							
HBW_P (Int - Ext)		Employment Growth Rate							
HBW_A (Int - Ext)	External Zone Population Growth Rate								
HBO_P	0.1758							1.0148	
HB0_A		0.2065	1.0030	0.5074					
NHB_P	0.0064						0.3048	0.8128	
NHB_A			0.1715					0.9855	
HBS_P	N/A								
HBS_A	Population Growth Rate								

3.1.1 Trip Generation for Home Based Work Trips

The internal HBW trip production and attraction rates within the City of Brantford are:

HBW Trip Productions (AM) = 0.4807 * Labour Force
HBW Trip Attractions (AM) = 0.5150 * Total Employment

HBW Trip Productions (PM) = 0.9450 * Employment Office + 0.5700 * Employment Professional + 0.2000 * Employment Sales/Service + 0.4700 * Employment Manufacturing
HBW Trip Attractions (PM) = 0.4500 * Labour Force

External – Internal work trips produced from external zones and Internal – External work trips attracted to the external zones were assumed to grow at the same growth rates as the external traffic traveling to/ from those external zones. Historical and future population and employment data was used to develop the growth factor for each external zone. ***Table 5*** summarizes the respective external traffic growth rates used.

Table 5: External TAZ Growth Rates

TAZ	Road Link	External Area	Growth per Year: Pop	Growth per Year: Emp	Growth per Year: Pop+Emp
20000	Hwy 403 E	GTA	1.1612	1.1559	1.1594
20100	CR 54 S	Haldimand County	1.0725	1.0588	1.0688
20200	CR 20 S	Haldimand County	1.0725	1.0588	1.0688
20300	CR 7 S	Haldimand County	1.0725	1.0588	1.0688
20400	CR 16 S	Haldimand County	1.0725	1.0588	1.0688
20500	Hwy 24 S	Haldimand County	1.0725	1.0588	1.0688
20600	CR 3 W	Norwich - Oxford County	1.1487	1.1594	1.1522
20700	Hwy 2, CR 53, Hwy 403 W	Norwich - Oxford County	1.1487	1.1594	1.1522
20800	CR 25 N	Kitchener - Region of Waterloo	1.1996	1.1836	1.1941
20900	CR 16 N	Kitchener - Region of Waterloo	1.1996	1.1836	1.1941
21000	CR 24A N	Kitchener - Region of Waterloo	1.1996	1.1836	1.1941
21100	Hwy 24 N	Kitchener - Region of Waterloo	1.1996	1.1836	1.1941
21200	CR 13 N	Kitchener - Region of Waterloo	1.1996	1.1836	1.1941
21300	Hwy 5 E	Hamilton	1.0980	1.1429	1.1111
21400	CR 99 E	Hamilton	1.0980	1.1429	1.1111

3.1.2 Trip Generation for Home Based Other and Non-Home Based Trips

The HBO trip production and attraction rates within the City of Brantford are:

HBO Trip Productions (AM) = 0.1140 * Total Population
HBO Trip Attractions (AM) = 0.0510 * Total Population + 0.1170 * Employment Professional + 0.3520 Employment Sales/Service

HBO Trip Productions (PM) = 0.1758 * Total Population + 1.0148 Employment Sales/Service
HBO Trip Attractions (PM) = 0.2065 * Total Employment + 1.0030 Population Sales/Service + 0.5074 Population Professional

The NHB trip production and attraction rates within the City of Brantford are:

NHB Trip Productions (AM) = 0.0250 * Total Population + 0.0600 * Employment Professional + 0.1250 Employment Sales/Service + 0.0900 Employment Manufacturing
NHB Trip Attractions (AM) = 0.0291 * Population Professional + 0.2910 * Employment Professional + 0.0950 Employment Sales/Service + 0.0212 Employment Manufacturing

NHB Trip Productions (PM) = 0.0064 * Total Population + 0.3048 * Employment Professional + 0.8128 Employment Sales/Service
NHB Trip Attractions (PM) = 0.1715 * Population Sales/Service + 0.9855 Employment Sales/Service

3.1.3 Trip Generation for Home Based School Trips

The HBS trips are assumed to be primarily dependent on population growth for respective TAZs. School trips that are attracted to a particular TAZ are assumed to be directly correlated to the population growth in that TAZ. Therefore, trip generation rates were not estimated for school trips, and future HBS attractions were based on existing HBS trips factored by the population growth rates of the traffic zones.

3.2 Trip Distribution

Using the productions and attractions by TAZ calculated in trip generation, trip distribution is the process by which the origin-to-destination choices are derived for trip makers. The result of this process is a series of trip matrices that are used in the travel demand model for additional matrix calculations and ultimately the assignment of trips to the transportation network.

The TransCAD model utilized the Fratar Method as the trip distribution method. This process was maintained in the migration to the VISUM platform. The Fratar Method utilizes a doubly constrained "Growth Factor" method (except for HBS trips which are singly constrained) to predict future trip patterns between zones. The Fratar Method uses the existing trip matrix as a basis for forecasting the future patterns, and develops growth factors for total trip productions and attractions by traffic zone to scale the values in the matrix. The equation for the growth factor method is shown by:

$$T_{ij} = t_{ij} * a_i * b_j$$

Where T_{ij} = forecast flow between zone i and zone j
t_{ij} = the base year flow between zone i and zone j
a_i = balancing factor for row i
b_j = balancing factor for row j

The methodology uses an iterative process that alternates between factoring the productions and then factoring the attractions to match the total forecast productions and attractions for each zone, with a pre-set convergence factor.

3.3 Mode Choice

The total person trip matrices derived in trip distribution (See ***Section 3.2***) are divided into person trips by specific travel modes. Mode share matrices were retained from the TransCAD model. Mode share was derived from TTS data and produced mode share percentage relationships for specific OD pairs in the model.

The City of Brantford currently takes a "policy approach" to mode share in their travel demand model. This means that the existing base year (i.e. 2016) mode share is derived from available data and future horizon year mode shares conform to policy mode share targets. A summary of the existing mode shares implemented in the model are presented in ***Table 6*** and ***Table 7.***

Table 6: 2016 Mode Share Percentages (Full Model)

Travel Mode	Mode Share (%)
Auto Driver	77.3%
Auto Passenger	10.2%
Transit	1.7%
School Bus	4.6%
Cycle/walk	6.0%
Other	0.2%
TOTAL	**100%**

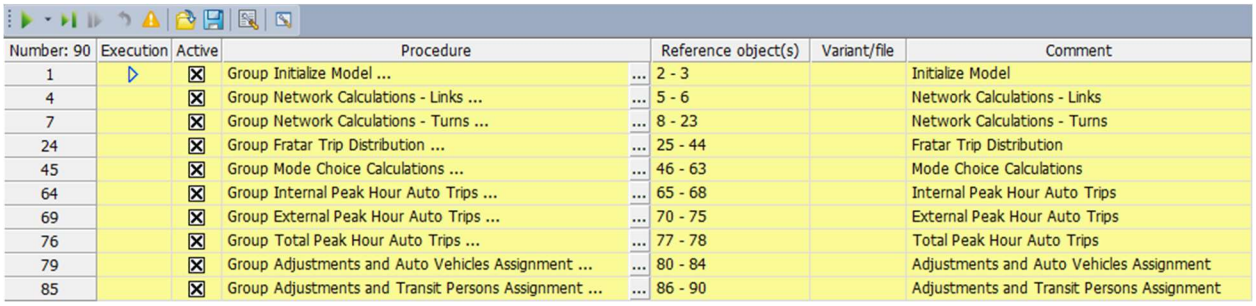
Table 7: 2016 Mode Share Percentages (Brantford Households only)

Travel Mode	Mode Share (%)
Auto Driver	73.9%
Auto Passenger	12.1%
Transit	2.4%
School Bus	4.8%
Cycle/walk	6.6%
Other	0.2%
TOTAL	**100%**

3.4 Model Run Procedures

The model run procedures implemented in VISUM were based on the previous procedures outlined in the TransCAD version of the model. The purpose of these procedures was to tie various objects, attributes, and matrices from within the travel demand model into a single one-click process that provides a reproducible, consistent approach to calculations within the VISUM model. ***Figure 7*** provides an overview screenshot of the Procedure Sequence window in VISUM.

Figure 7: VISUM Procedure Sequence Window



Number: 90	Execution	Active	Procedure	Reference object(s)	Variant/file	Comment
1		☒	Group Initialize Model ...	2 - 3		Initialize Model
4		☒	Group Network Calculations - Links ...	5 - 6		Network Calculations - Links
7		☒	Group Network Calculations - Turns ...	8 - 23		Network Calculations - Turns
24		☒	Group Fratar Trip Distribution ...	25 - 44		Fratar Trip Distribution
45		☒	Group Mode Choice Calculations ...	46 - 63		Mode Choice Calculations
64		☒	Group Internal Peak Hour Auto Trips ...	65 - 68		Internal Peak Hour Auto Trips
69		☒	Group External Peak Hour Auto Trips ...	70 - 75		External Peak Hour Auto Trips
76		☒	Group Total Peak Hour Auto Trips ...	77 - 78		Total Peak Hour Auto Trips
79		☒	Group Adjustments and Auto Vehicles Assignment ...	80 - 84		Adjustments and Auto Vehicles Assignment
85		☒	Group Adjustments and Transit Persons Assignment ...	86 - 90		Adjustments and Transit Persons Assignment

Once the procedure sequence has been initiated, model run processes execute in numerical order. The Procedure Sequence functionality in VISUM is model-specific and can be tailored to the unique requirements of each model. Over time, these procedures can be modified and expanded as the travel demand model methodology continues to evolve. ***Table 8*** further details the purpose of each model procedure group.

Table 8: Brantford Travel Demand Model Methodology

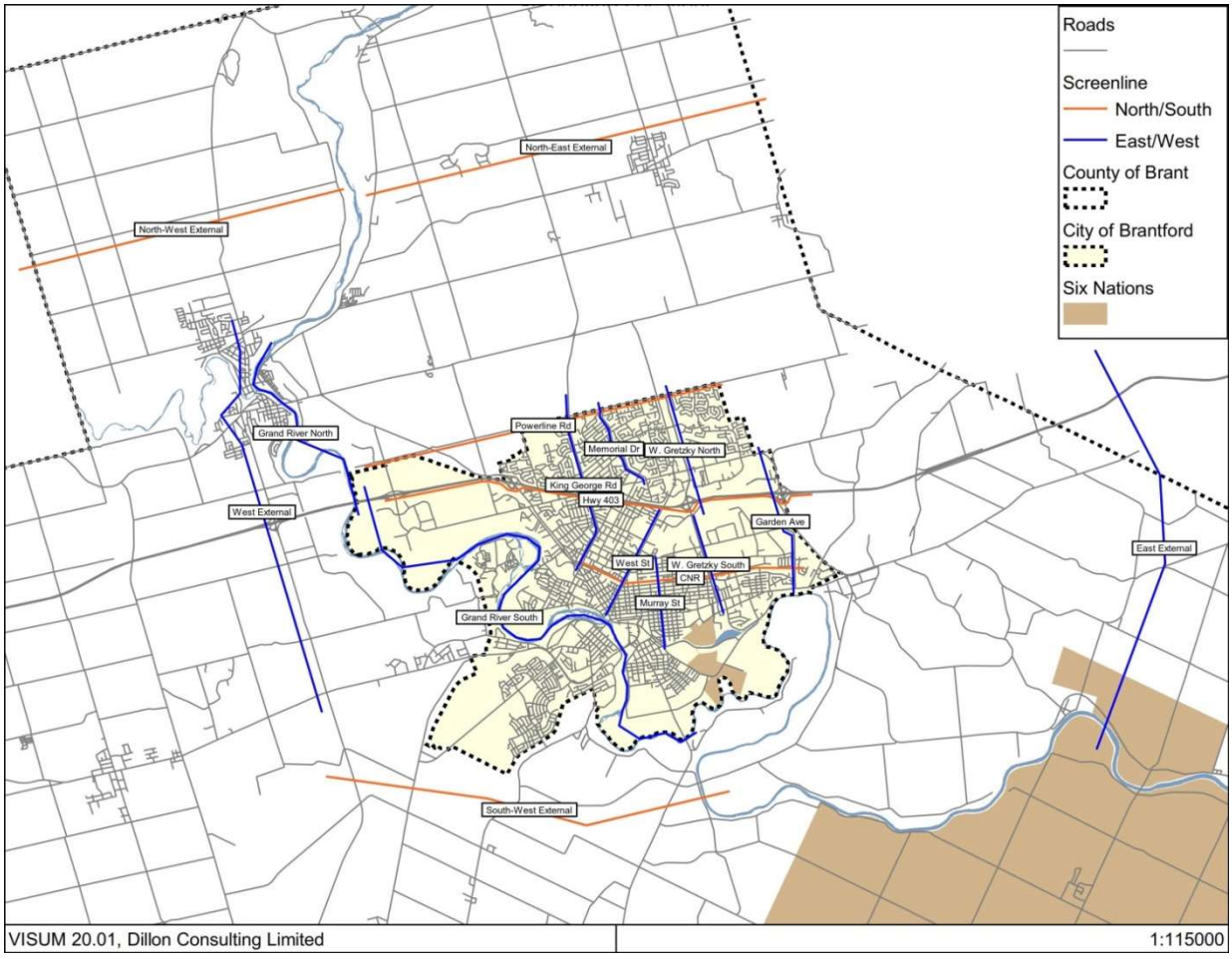
Procedure Group	Step Range	Procedure Purpose
Initialize Model	1-3	• Initialize previous assignment and filter settings to prepare for a new model run.
Network Calculations - Links	4-6	• Use Link Type attributes (see ***Table 1***) and number of lanes to calculate directional capacity and free flow speeds.
Network Calculations - Turns	7-23	• Calculate Node capacities based on sum of outbound link capacities by 0.5. • Left turn and U-turn capacities set to 10% of approach link capacity and initial delay of 10 seconds. • Right turn capacities set to 15% of approach link capacity and initial delay of 1 second.
Fratar Trip Distribution	24-44	• Apply growth factor method (Fratar) or Iterative Proportional Fitting (IPF) to initial seed matrix, using trip end totals.
Mode Choice Calculations	45-63	• Sum Trip Purposes to Total Internal Person Trips. • Multiply Total Internal Person Trips by each mode share.
Internal Peak Hour Auto Trips	64-68	• Sum Internal Auto Person Trips. • Convert Auto Person Trips to Vehicle Trips by using an Auto Occupancy factor. • Convert peak period (3-hour) demands to peak hour by using a Peak Hour Factor (PHF).
External Peak Hour Auto Trips	69-75	• Sum External Auto Person Trips • Apply 1% Compound Annual Growth Rate (CAGR) to External-Through matrix. • Convert peak period (3-hour) demands to peak hour by using a Peak Hour Factor (PHF).
Total Peak Hour Auto Trips	76-78	• Sum all Auto Vehicle matrices from 'Internal Peak Hour Auto Trips' and 'External Peak Hour Auto Trips'
Adjustments and Auto Vehicles Assignment	79-84	• Apply auto vehicle matrix correction factors. • Run 500 iterations of "Equilibrium Lohse" type assignment.
Adjustments and Transit Persons Assignment	85-90	• Apply transit vehicle matrix correction factors. • Run "Headway-based" assignment.

4.0 Calibration and Validation

Once the updated model was calibrated to predict base year trip generation, the model was tested to determine if the trip assignment process could replicate existing observed volumes on the road network. This process is referred to as validation.

For automobile vehicle trips, validation of the model was performed by comparing the observed volumes from the existing traffic count data[3] (2015-2018) with the simulated volumes for the same links from the model. Validation is usually undertaken at the screenline level of detail in travel demand models. Screenlines are imaginary lines, in which the locations are chosen strategically to capture traffic that crosses major arterial roads, rivers, or other major physical boundaries in an area. ***Figure 8*** displays the strategic screenline locations in the Brantford travel demand model.

Figure 8: Screenline Locations



[3] Existing traffic count data consists of 65 Turing Movement Counts (TMC) or Automatic Traffic Recorder (ATR) counts that were collected between 2015 and 2018, of which 71% or 46 of the counts were collected in 2017 and 2018.

Based on the validation results presented in ***Table 9*** and ***Table 10*** for the AM peak Hour and ***Table 11*** and ***Table 12*** for the PM Peak Hour, the updated model is capable of forecasting flows within 5-10% (or a GEH[4] of 5.0) of observed volumes across most major screenlines. Screenlines are used to compare model estimated volumes with traffic counts in key areas of the City and they are also used to determine corridors that have road network deficiencies.

Table 9: Screenline Calibration Results – AM Peak Hour (summary)

SCREENLINES	Passed 6 of 6								ON
Criteria	Flow Range		Criteria		Goal	Current	Count	Model	
Within 150 veh/h, for Flow < 1500 veh/h > 85% of cases	0	1500	150	veh	85%	100%	12	12	✓
Within 15%, for 1500 veh/h < Flow < 5000 >85% of cases	1500	5000	15	%	85%	100%	22	22	✓
Within 750 veh/h, for Flow > 5000 veh/h > 85% of cases	5000		750	veh	85%	--	0	0	
Sum of all screenline flows within 5% of sum of all screenline counts	Overall		5	%	5%	1%	68998	68635	✓
GEH < 5 for Individual screenline Flows > 85% of cases	Overall		5	GEH	85%	100%	34	34	✓
GEH < 10 for individual screenline flows, 95% of cases	Overall		10	GEH	95%	100%	34	34	✓
GEH < 4 for sum of all screenline counts	Overall		4	GEH	4.0	1.4	68998	68635	✓

[4] GEH statistic is a formula used in traffic modelling to compare two sets of traffic volumes. It provides a goodness-of-fit measures that takes into account the significant variability in real world traffic volumes. For example, a freeway may carry 5000 vehicles per hour, while one of the on-ramps leading to the freeway might carry only 50 vehicles per hour. In that situation it would not be possible to select a single percentage of variation that is acceptable for both volumes. A GEH value of less than 5.0 is considered a good match between the modelled and observed hourly volumes, while a GEH of between 5.0 and 10.0 may warrant investigation, and a GEH greater than 10.0 is a poor match.

Table 10: Screenline Calibration Results – AM Peak Hour (detailed)

SCREENLINE ANALYSIS

Analysis Period	AM Car
Secondary	

ACCEPTABLE RANGE	
VOLUME	750
% DIFF	10
GEH	5

SCREENLINE SUMMARY							
#	Name	Direction	Count	Model	DIFF	% DIFF	GEH
1	Grand River South	EB	3628	3619	-9	-0.2%	0.1
	Grand River South	WB	2514	2510	-4	-0.2%	0.1
2	Grand River North	EB	1918	2011	93	4.8%	2.1
	Grand River North	WB	1656	1662	6	0.4%	0.1
3	Highway 403	NB	3857	3999	142	3.7%	2.3
	Highway 403	SB	4672	4650	-22	-0.5%	0.3
4	King George Road	EB	3336	3206	-130	-3.9%	2.3
	King George Road	WB	2594	2403	-191	-7.4%	3.8
5	Wayne Gretzky Parkway (North)	EB	3056	3153	97	3.2%	1.7
	Wayne Gretzky Parkway (North)	WB	3121	3172	51	1.6%	0.9
6	Wayne Gretzky Parkway (South)	EB	1398	1499	101	7.2%	2.7
	Wayne Gretzky Parkway (South)	WB	1082	1070	-12	-1.1%	0.4
7	Memorial Drive	EB	1031	949	-82	-8.0%	2.6
	Memorial Drive	WB	1148	1145	-3	-0.3%	0.1
8	West Street	EB	1527	1431	-96	-6.3%	2.5
	West Street	WB	1486	1506	20	1.3%	0.5
9	CNR Corridor	NB	3006	3071	65	2.2%	1.2
	CNR Corridor	SB	2788	2793	5	0.2%	0.1
10	Garden Avenue	EB	3158	3108	-50	-1.6%	0.9
	Garden Avenue	WB	2994	2895	-99	-3.3%	1.8
11	Powerline Road	NB	1616	1602	-14	-0.9%	0.3
	Powerline Road	SB	2027	2041	14	0.7%	0.3
12	Murray Street	EB	1255	1247	-8	-0.6%	0.2
	Murray Street	WB	1129	1209	80	7.1%	2.3
13	West External	EB	1676	1601	-75	-4.5%	1.9
	West External	WB	1535	1478	-57	-3.7%	1.5
14	South-West External	NB	1595	1564	-31	-1.9%	0.8
	South-West External	SB	823	836	13	1.6%	0.5
15	East External	EB	2667	2466	-201	-7.5%	4.0
	East External	WB	2392	2204	-188	-7.9%	3.9
16	North-East External	NB	561	682	121	21.6%	4.9
	North-East External	SB	453	482	29	6.4%	1.3
17	North-West External	NB	713	728	15	2.1%	0.6
	North-West External	SB	586	643	57	9.7%	2.3

Table 11: Screenline Calibration Results – PM Peak Hour (summary)

SCREENLINES	Passed 7 of 7								ON
Criteria	Flow Range		Criteria		Goal	Current	Count	Model	
Within 150 veh/h, for Flow < 1500 veh/h > 85% of cases	0	1500	150	veh	85%	86%	7	6	✓
Within 15%, for 1500 veh/h < Flow < 5000 >85% of cases	1500	5000	15	%	85%	100%	25	25	✓
Within 750 veh/h, for Flow > 5000 veh/h > 85% of cases	5000		750	veh	85%	100%	2	2	✓
Sum of all screenline flows within 5% of sum of all screenline counts	Overall		5	%	5%	1%	88396	89602	✓
GEH < 5 for Individual screenline Flows > 85% of cases	Overall		5	GEH	85%	97%	34	33	✓
GEH < 10 for individual screenline flows, 95% of cases	Overall		10	GEH	95%	100%	34	34	✓
GEH < 4 for sum of all screenline counts	Overall		4	GEH	4.0	4.0	88396	89602	✓

Table 12: Screenline Calibration Results – PM Peak Hour (detailed)

SCREENLINE ANALYSIS

Analysis Period	PM Car
Secondary	

ACCEPTABLE RANGE	
VOLUME	750
% DIFF	10
GEH	5

SCREENLINE SUMMARY

#	Name	Direction	Count	Model	DIFF	% DIFF	GEH
1	Grand River South	EB	3614	3566	-48	-1.3%	0.8
	Grand River South	WB	3762	3939	177	4.7%	2.9
2	Grand River North	EB	2327	2365	38	1.6%	0.8
	Grand River North	WB	2261	2429	168	7.4%	3.5
3	Highway 403	NB	5783	5884	101	1.7%	1.3
	Highway 403	SB	5349	5582	233	4.4%	3.2
4	King George Road	EB	3533	3490	-43	-1.2%	0.7
	King George Road	WB	3817	3747	-70	-1.8%	1.1
5	Wayne Gretzky Parkway (North)	EB	3652	3766	114	3.1%	1.9
	Wayne Gretzky Parkway (North)	WB	3989	4256	267	6.7%	4.2
6	Wayne Gretzky Parkway (South)	EB	1438	1534	96	6.7%	2.5
	Wayne Gretzky Parkway (South)	WB	1818	2031	213	11.7%	4.9
7	Memorial Drive	EB	1688	1691	3	0.2%	0.1
	Memorial Drive	WB	1537	1432	-105	-6.8%	2.7
8	West Street	EB	1799	1948	149	8.3%	3.4
	West Street	WB	2236	2268	32	1.4%	0.7
9	CNR Corridor	NB	3557	3602	45	1.3%	0.8
	CNR Corridor	SB	4164	4385	221	5.3%	3.4
10	Garden Avenue	EB	3835	3590	-245	-6.4%	4.0
	Garden Avenue	WB	4099	3963	-136	-3.3%	2.1
11	Powerline Road	NB	2512	2605	93	3.7%	1.8
	Powerline Road	SB	2470	2555	85	3.4%	1.7
12	Murray Street	EB	1483	1408	-75	-5.1%	2.0
	Murray Street	WB	1818	1881	63	3.5%	1.5
13	West External	EB	2091	2053	-38	-1.8%	0.8
	West External	WB	1923	1833	-90	-4.7%	2.1
14	South-West External	NB	1038	1045	7	0.7%	0.2
	South-West External	SB	1729	1696	-33	-1.9%	0.8
15	East External	EB	2858	2611	-247	-8.6%	4.7
	East External	WB	2902	2837	-65	-2.2%	1.2
16	North-East External	NB	705	806	101	14.3%	3.7
	North-East External	SB	917	1112	195	21.3%	6.1
17	North-West External	NB	780	819	39	5.0%	1.4
	North-West External	SB	912	873	-39	-4.3%	1.3

5.0 Conclusion

Based on the foregoing, the City of Brantford's 4-step travel demand model was successfully migrated from the TransCAD platform to the VISUM platform. The model captures travel behavior for the area and calibrates well against measured data. Its procedure parameters are suitable for use when testing land use and transport facility scenarios for forecasting demand and assignment of travel.

6.0 Future Assessment

The *Places to Grow* (August 2020) policies include growth forecasts for the City of Brantford with a residential population of 165,000 and an employment level of 80,000 by 2051. Brantford's 2051 population and employment forecasts were disaggregated by SGL Planning & Design Inc. to match the Traffic Analysis Zone (TAZ) structure within the City's strategic transportation model. The allocations were based on intensification policies and targets, Schedule 1: Growth Management in the City's draft Official Plan, land use designations, and sites with known development potential.

At a summary level, the growth forecasts used in this TMP growth analysis are shown in *Table 13* and *Table 14* below for the City of Brantford and County of Brant respectively. Detailed TAZ level population and employment data for Brantford and Brant County (2016 and 2051) can be found in *Appendix A*.

Table 13: City of Brantford Population and Employment to 2051 – TAZ Distribution

Horizon Year	Population (Persons)	Employment (Jobs)
2016	101,700[1]	44,900[1]
2021 Est	111,300	53,600
2026 Est	125,200	60,300
2031	139,000[2]	67,000[2]
2036	152,000[2]	72,000[2]
2041	162,150[1]	80,150[1]
2051	164,736[1]	83,365[1]

Source: [1] SGL Planning and Design, 2021
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019

Table 14: County of Brant Population and Employment to 2051 – Growth Plan

Horizon Year	Population (Persons)	Employment (Jobs)
2016	38,000[1]	15,000[1]
2021 Est	41,000	17,000
2026 Est	44,000	19,000
2031	49,000[2]	22,000[2]
2036	53,000[2]	24,000[2]
2041	57,000[2]	26,000[2]
2051	59,000[3]	26,000[3]

Source: [1] *Greater Golden Horseshoe*: Growth Forecasts to 2051, Hemson Consulting Ltd., 2020
[2] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019
[3] A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020

Applying updated growth forecasts, disaggregated to the TAZ level-of-detail, the City's model was utilized to forecast future travel demands (i.e. Future Conditions) resulting from population growth, employment growth, and future land use patterns and densities as provided by the City. These were further enhanced using output from the ongoing Official Plan Update. Forecasted Future Conditions and various alternative transportation strategies were subsequently assessed based on the strategic direction criteria.

6.1 2051 'Do Minimal' Scenario

The 2051 'Do Minimal' Scenario accounts for proposed growth under a transportation network scenario with minimal improvements over today's condition, were identified. The changes to the road network include only short term committed projects (e.g. The Oak Park Road/Highway 403 interchange upgrade) and collector roads required to support the expansion growth areas (required to provide access to future development).

An overview of the link attributes and volumes (AM and PM) and screenline capacities for the 2051 'Do Minimal' network are illustrated in *Appendix B* and *Appendix C* respectively.

6.2 2051 Manage Travel Demand Scenario

The 2051 Mange Travel Demand Scenario increases the transit mode share to 5.8% and the combined Active Transportation (walking and cycling) modes shares to 9.9%. This Transportation Demand Management (TDM) scenario is assigned to the 'Do Minimal' network.

An overview of the link volumes and screenline capacities for the 2051 Mange Travel Demand network are illustrated in *Appendix B* and *Appendix C* respectively.

6.3 2051 Increase Infrastructure Scenario

The 2051 Increase Infrastructure Scenario enhances the carrying capacity of the network through strategic road widenings and extensions. This includes short-term committed improvements, as well as a full program of infrastructure projects as was identified in the 2014 Transportation Master Plan (excluding a Veteran's Memorial Parkway extension, due to recent Glebe Lands resolution).

An overview of the link volumes and screenline capacities for the 2051 Increase Infrastructure network are illustrated in *Appendix B* and *Appendix C* respectively.

6.4 2051 Recommended Scenario

The 2051 Recommended Scenario combines the mode shares from the 2051 Mange Travel Demand Scenario, with many of the infrastructure projects from the 2051 Increase Infrastructure Scenario and a

number of additional infrastructure projects. A comprehensive list of the Recommended Scenario infrastructure projects include:

- Infrastructure widenings:
  - Wayne Gretzky Parkway between Henry Street and Lynden Road;
  - Veterans Memorial Parkway between Mount Pleasant and Market Street South;
  - Colborne Street West from County Road 7 to the existing 4-lane section;
  - Paris Road from Golf Road to Oak Park Road;
  - Oak Park Road from Hardy Road to Powerline Road; and
  - Powerline Road from Oak Park Road to the City east limits.
- New roads:
  - Oak Park Road extension to Colborne Road West;
  - Wayne Gretzky Parkway extension to connect with Park Road;
  - East-West Collector Road north of Powerline from Oak Park Road to East City Limits;
  - Conklin Road Extension from Mt. Pleasant Road to Phelps Road; and
  - Charing Cross Street extension to Henry Street.
- Corridor Transportation System Management (TSM):
  - Golf Road;
  - Paris Road;
  - Brant Ave;
  - Hardy Road;
  - West Street;
  - King George Road;
  - Erie Avenue;
  - Clarence Street; and
  - County Road 18 (note that this is a County Road. The City will work with the County to determine potential for improvements to the corridor).

An overview of the link volumes and screenline capacities for the 2051 Recommended Network are illustrated in *Appendix B* and *Appendix C* respectively.

Appendix A

TAZ Population & Employment

Brantford Model: TAZ Population & Employment

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
101	1,675	40	1570	144
102	0	0	0	0
103	85	2	212	308
104	870	21	763	67
105	960	23	839	61
106	630	15	556	43
107	410	10	363	41
108	270	115	448	140
109	200	761	536	805
110	70	172	110	180
111	30	1	24	5
201	225	916	934	982
202	390	9	341	38
203	240	6	247	21
204	270	6	239	21
205	5	176	79	187
206	425	10	420	40
207	880	21	771	76
301	585	14	587	61
302	520	143	485	189
303	820	20	717	66
304	55	1	33	14
305	80	383	0	429
306	495	234	576	260
401	490	171	428	221
402	245	6	219	24
403	270	166	326	190
404	165	4	149	25
405	5	518	1032	573
406	0	1,204	461	1125
407	115	316	367	339
501	720	17	685	50
502	990	24	883	61
503	520	12	460	47
504	275	126	869	153
505	525	13	459	45
506	880	186	785	239
507	475	11	428	29
508	725	17	638	59
509	895	21	786	56
510	545	13	490	48
511	1,050	25	937	56

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
512	350	492	625	543
513	445	11	628	22
514	930	22	1002	58
515	1,145	164	1129	221
516	195	5	362	12
601	355	9	309	45
602	545	13	488	60
603	955	23	831	61
604	915	22	795	49
605	725	17	635	50
606	1,000	24	867	74
701	0	694	0	769
702	0	546	174	602
703	0	1,623	141	1493
704	0	995	267	951
705	5	916	701	1009
706	0	381	357	445
707	0	154	0	489
708	0	887	1251	954
801	0	2,042	0	2351
901	5	1,826	649	2953
902	0	506	0	544
903	0	319	0	372
1001	0	836	819	919
1002	0	364	406	399
1003	15	1,180	0	1190
1004	0	1,525	0	1419
1005	5	404	0	467
1006	0	0	0	13
1007	0	597	0	666
1008	0	0	0	296
1101	30	1	0	10
1102	45	1	0	14
1103	35	1	21	4
1104	425	10	454	28
1105	140	185	135	205
1106	200	130	533	190
1107	315	8	279	56
1108	330	8	307	26
1109	455	11	436	25
1110	575	14	546	29
1201	55	155	186	191
1202	150	4	221	22
1203	155	607	377	822

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
1204	75	258	57	298
1205	0	193	0	219
1206	5	0	662	31
1301	365	9	436	26
1302	190	5	184	13
1303	25	1	0	51
1304	600	14	682	50
1305	60	1	0	5
1306	120	3	125	9
1307	240	6	222	24
1308	65	2	47	4
1309	25	126	110	136
1310	345	8	657	20
1311	205	170	184	200
1312	60	1	0	8
1401	245	245	306	273
1402	305	7	272	16
1403	305	7	290	24
1404	145	3	159	16
1405	320	8	296	25
1406	240	6	217	18
1407	440	11	429	42
1408	465	290	423	361
1501	100	1,715	147	1778
1502	415	10	492	29
1503	105	3	135	6
1504	245	6	240	19
1505	30	1	12	2
1506	115	3	154	5
1507	240	6	244	20
1508	200	261	273	278
1509	355	145	410	167
1510	720	273	826	317
1511	315	8	301	25
1512	50	206	47	215
1601	485	12	479	68
1602	560	127	738	165
1603	520	12	455	53
1604	315	326	275	380
1605	125	3	112	13
1606	720	17	644	61
1607	185	306	250	331
1608	635	15	559	63
1609	255	6	239	28

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
1610	330	8	320	29
1611	420	10	382	37
1612	155	4	138	25
1701	0	0	0	1131
1702	5	546	38	3406
1703	0	0	0	2943
1704	5	2,486	0	2771
1801	315	8	279	82
1802	465	142	429	291
1803	130	3	118	19
1804	475	11	420	41
1805	110	372	109	452
1806	410	10	418	30
1901	285	155	399	371
1902	0	438	0	479
1903	370	288	333	338
1904	205	5	186	18
1905	725	17	789	48
2001	865	21	770	104
2002	0	0	0	67
2003	0	0	0	19
2004	85	804	0	870
2005	0	165	59	186
2006	45	1	0	24
2007	175	4	225	16
2008	295	7	349	22
2101	130	3	119	34
2102	795	19	860	68
2103	305	7	308	20
2104	130	3	136	7
2105	30	1	3	1
2106	310	371	308	452
2201	195	5	242	10
2202	80	2	3	2
2203	80	2	0	2
2204	45	1	0	2
2205	55	1	4	1
2206	85	2	0	4
2207	55	1	0	3
2208	135	3	241	28
2209	75	2	3	2
2210	65	2	0	2
2211	25	1	0	2
2212	55	1	0	2

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
2213	135	3	164	9
2214	130	3	144	10
2215	230	6	272	15
2216	405	10	503	26
2217	50	1	8	3
2218	50	1	1	4
2301	50	1	14	53
2302	85	2	134	55
2303	35	1	0	30
2304	175	4	242	86
2305	80	2	47	41
2306	55	1	53	42
2307	45	1	0	60
2308	65	349	30	418
2309	120	3	136	63
2310	195	5	256	65
2401	0	0	0	12
2402	5	0	31	24
2403	15	0	38	40
2404	20	0	34	33
2405	5	705	111	749
2406	20	0	38	26
2407	25	1	38	24
2408	40	115	34	143
2409	60	1	29	25
2410	5	0	39	38
2411	0	142	45	185
2412	30	405	50	457
2413	120	213	210	262
2414	0	119	0	144
2415	0	0	0	20
2416	45	1	12	21
2417	15	222	15	260
2418	20	262	22	301
2419	0	0	37	31
2420	0	301	69	362
2421	5	0	46	30
2422	460	176	702	219
2423	10	0	42	29
2424	40	1	0	29
2425	145	168	260	279
2501	35	1	0	54
2502	465	11	479	75
2503	480	12	555	42

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
2504	230	6	258	32
2505	145	3	193	47
2506	255	6	335	52
2507	125	3	213	44
2508	130	3	115	8
2509	355	9	359	21
2510	300	7	290	19
2511	175	4	164	11
2512	190	5	207	12
2513	155	4	170	11
2514	155	4	215	8
2601	65	2	10	6
2602	280	7	256	20
2603	245	6	238	16
2604	110	3	95	6
2605	95	2	0	4
2606	30	1	0	2
2607	0	0	11	0
2608	95	2	0	7
2609	335	8	327	27
2610	445	11	398	32
2611	120	3	122	10
2612	520	12	715	28
2613	15	0	40	2
2614	105	3	99	9
2615	70	2	158	13
2701	485	142	444	165
2702	35	416	31	444
2703	200	5	191	19
2704	95	2	0	13
2705	85	2	108	9
2706	475	137	468	167
2707	635	15	821	38
2708	900	22	1013	61
2709	145	3	209	22
2710	620	15	903	57
2801	70	2	0	38
2802	90	2	3	9
2803	345	8	478	25
2804	770	18	704	85
2805	75	2	5	4
2806	195	5	264	62
2807	0	0	0	1
2808	0	0	0	26

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
2901	0	0	104	13
2902	0	0	155	5
2903	0	0	0	5
2904	350	202	574	237
3001	735	177	889	212
3002	385	9	420	31
3003	930	130	1053	170
3004	545	150	555	185
3101	0	0	313	884
3102	5	0	1383	501
3103	0	0	0	1
3104	0	222	0	265
3105	0	0	0	287
3201	1,450	132	1328	197
3202	685	136	814	169
3203	165	4	507	70
3204	10	0	180	17
3205	0	0	0	9
3301	730	18	3008	155
3302	1,500	36	1399	97
3401	0	939	666	1254
3402	0	0	124	213
3403	0	392	3557	684
3404	0	365	1031	409
3405	0	0	23	402
3406	75	2	370	193
3407	0	0	393	70
3501	430	10	411	39
3502	5	0	1	13
3503	425	10	372	29
3504	135	3	131	7
3505	550	13	601	38
3506	505	12	563	43
3507	205	5	1507	67
3508	10	0	0	20
3509	30	1	552	17
3510	10	364	33	384
3511	10	0	0	2
3512	10	0	626	18
3601	295	7	274	45
3602	320	8	288	37
3603	50	1	90	32
3604	5	0	0	78
3701	0	0	3225	91

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
3702	405	84	4243	243
3703	845	20	778	22
3704	465	11	1466	168
3705	165	249	132	288
3706	925	22	1083	33
3707	1,400	34	1222	94
3708	2,120	148	2462	268
3709	1,620	39	1425	157
3710	310	7	301	23
3901	0	0	0	335
4501	5	0	2561	326
4502	475	11	884	39
4503	2,780	732	2903	894
4601	0	0	0	102
4602	30	1	1092	131
4603	0	0	53	3
4701	450	11	390	104
4702	255	6	219	23
4703	420	10	385	26
4704	95	2	842	27
4705	300	7	261	14
4706	770	18	751	22
4801	980	695	952	812
4802	1,605	192	1824	262
4803	760	18	987	60
4901	545	13	520	45
4902	370	9	326	32
4903	895	21	785	62
4904	655	16	589	51
4905	1,280	31	1901	69
4906	415	10	389	31
5001	0	0	0	657
5002	5	0	0	509
5003	0	0	0	323
5004	20	0	0	1065
5101	0	0	0	2
5102	0	0	0	0
5103	0	0	0	4
5104	0	0	0	0
5105	0	0	652	18
5106	0	0	223	6
5107	0	0	1896	87
5200	33	70	47	55
5201	0	0	0	0

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
5202	0	0	0	0
5203	0	0	356	16
5204	0	0	224	6
5205	5	0	810	67
5206	40	1	759	21
5300	79	72	75	88
5301	0	0	61	2
5302	0	0	54	1
5303	0	0	0	0
5401	0	0	183	226
5402	0	0	564	32
5403	0	0	591	22
5404	0	0	555	64
5405	10	0	430	718
5406	0	0	1182	57
5407	0	0	503	22
5408	15	0	640	29
5501	0	0	1059	275
5502	0	0	939	36
5503	0	0	425	13
5504	0	0	206	10
5505	0	0	137	10
5506	0	0	448	88
5507	45	1	786	162
5508	5	0	744	44
5509	0	0	498	35
5510	5	0	416	31
5511	0	0	703	85
5512	5	0	798	155
5601	15	0	0	0
5602	0	0	0	0
5603	15	0	0	0
5604	0	0	0	0
5605	0	0	0	0
5606	0	0	0	0
5607	0	0	0	0
5608	0	0	0	0
5609	0	0	0	0
5610	0	0	0	0
5611	15	188	22	200
5612	0	0	7	0
5613	0	0	0	0
5614	0	0	0	0
5615	0	0	0	0

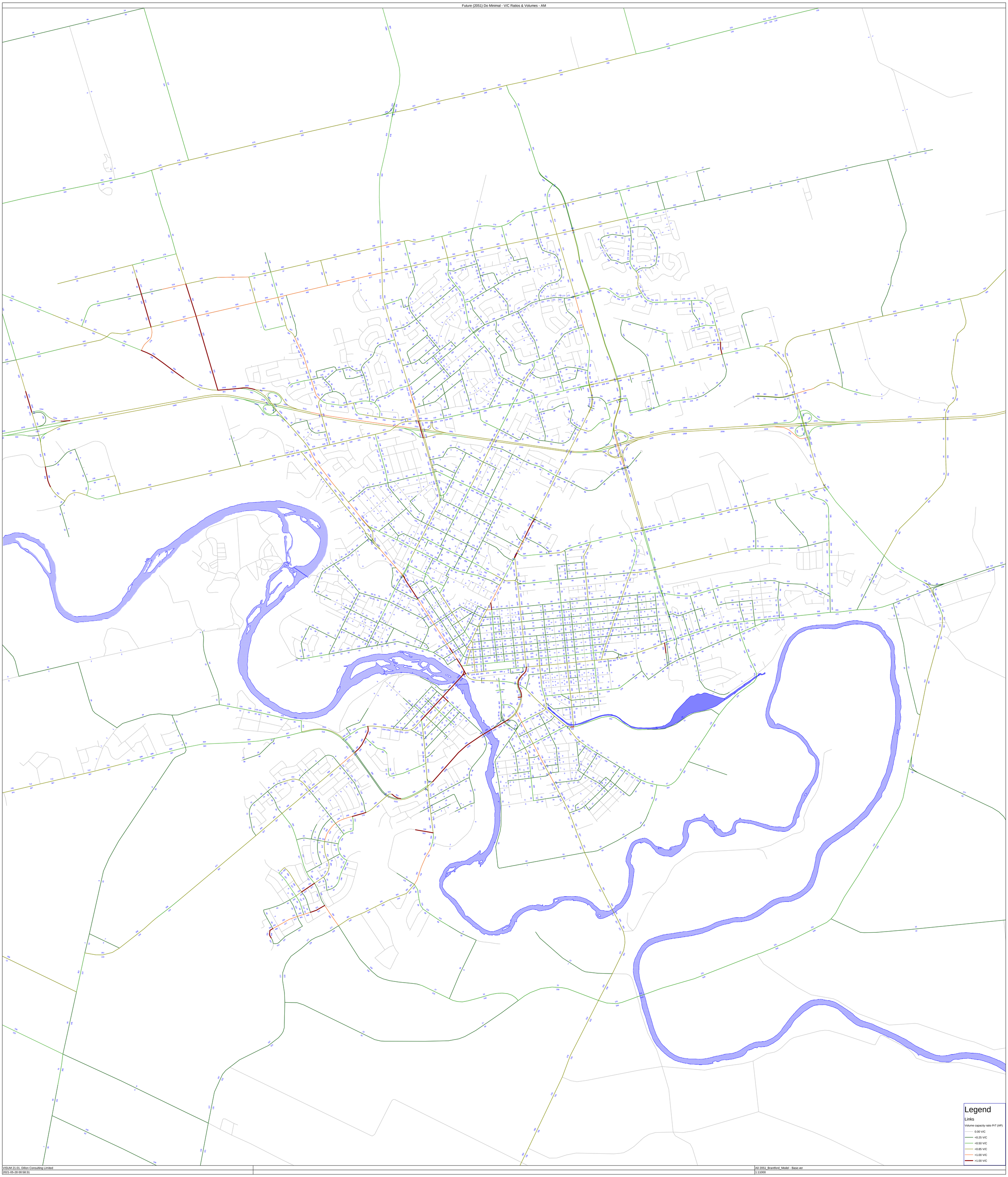
TAZ	2016		2051	
	Pop	Emp	Pop	Emp
5701	25	1	0	0
5702	0	0	0	0
5703	30	1	0	0
5704	0	0	0	0
5705	0	0	0	0
5706	10	0	5	2
5707	0	0	489	30
5708	0	0	534	31
5709	0	0	609	213
5710	5	0	922	97
5711	0	0	789	44
5712	0	0	361	80
5801	0	0	0	209
5802	0	0	0	0
5803	10	0	0	844
5804	0	0	232	462
5805	0	0	0	478
5806	15	0	206	375
5900	20	0	0	747
5901	10	0	0	810
5902	0	0	0	563
5903	15	0	1227	44
5904	0	0	2190	92
6000	64	71	38	44
6001	0	0	0	196
6002	0	0	0	169
6003	0	0	0	156
6004	0	0	0	391
6005	0	0	0	425
6006	0	0	0	1152
6007	5	0	0	1089
6008	0	0	0	21
6009	10	0	0	681
6010	0	0	0	548
7000	79	740	94	1,131
7001	0	0	0	0
7100	5,233	1,983	15,918	10,606
7200	868	251	1,172	282
7300	8,684	501	11,720	565
7400	1,042	1,504	1,406	1,692
7500	1,042	752	1,406	846
7600	695	501	937	565
7700	2,084	501	2,813	565
7800	2,952	1,002	3,985	1,128

TAZ	2016		2051	
	Pop	Emp	Pop	Emp
7900	250	67	450	104
7901	145	3	125	4
8000	397	102	473	153
8100	159	197	190	300
8200	0	1,304	0	1,980
8300	714	740	851	1,131
8400	79	72	94	110
8500	0	53	33	27
8501	40	1	636	19
8502	530	13	2220	69
8600	70	2	4403	181
8700	759	71	899	104
8701	35	1	127	9
8800	476	72	568	110
8900	1,032	72	1,230	110
9000	1,190	740	1,419	1,131
9100	556	72	663	110
9200	317	496	378	752
9300	476	72	568	110
9400	1,671	381	1,893	429
9500	1,193	508	1,352	572
9600	859	127	973	143
9700	1,050	254	1,189	286
9800	1,389	287	1,585	322
9900	780	110	891	123
10000	692	164	790	184
10100	793	126	898	143
10200	0	0	0	0
Total	**134,332**	**58,628**	**221,726**	**109,364**

Appendix B

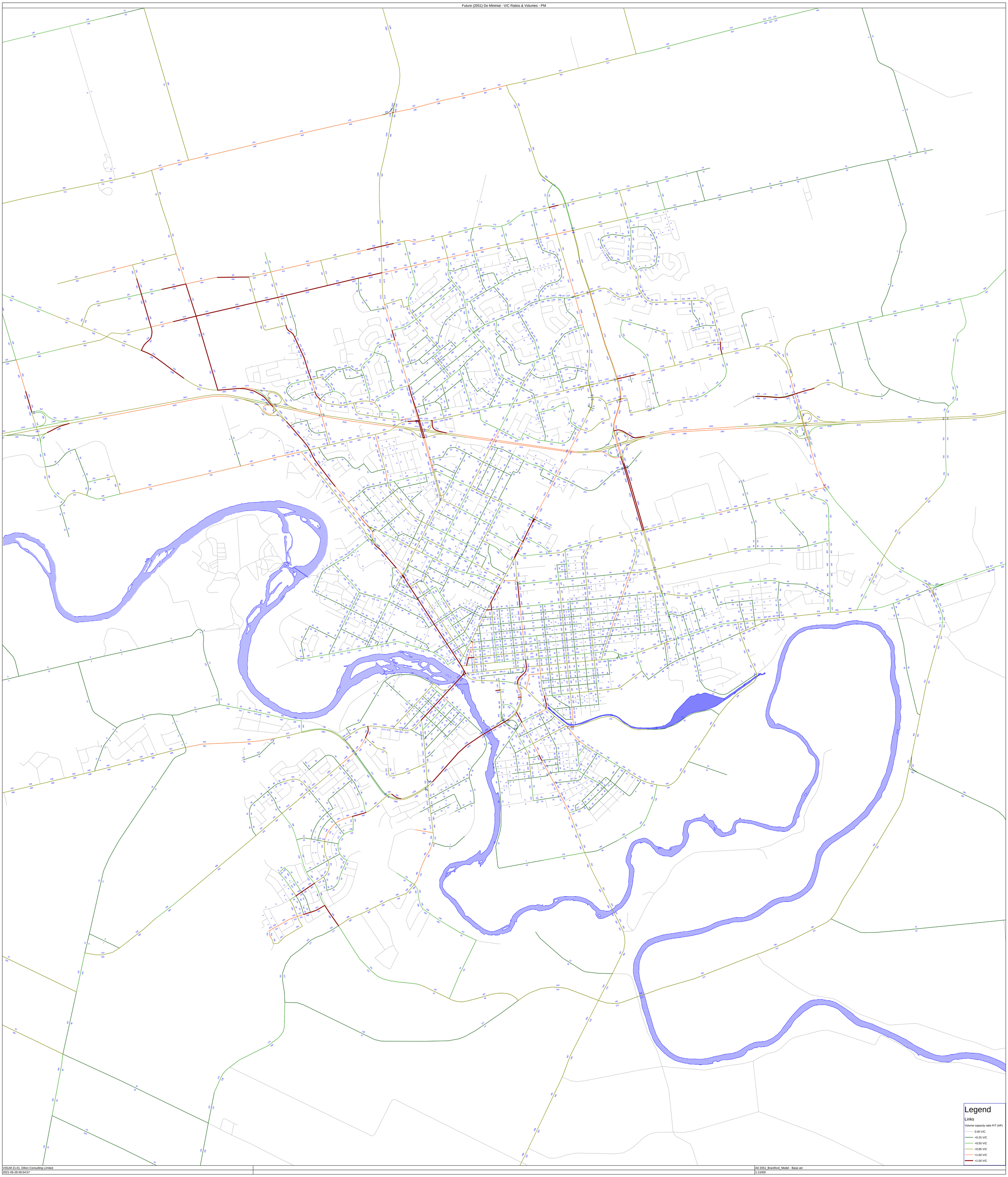
Model Plots – Link Attributes & Volumes

Future (2051) Do Minimal - V/C Ratios & Volumes - AM



VISUM 21.01, Dillon Consulting Limited		A0 2051_Brantford_Model - Base.ver
2021-05-28 00:58:31		1:11000

Future (2051) Do Minimal - V/C Ratios & Volumes - PM



VISUM 21.01, Dillon Consulting Limited		A0 2051_Brantford_Model - Base.ver
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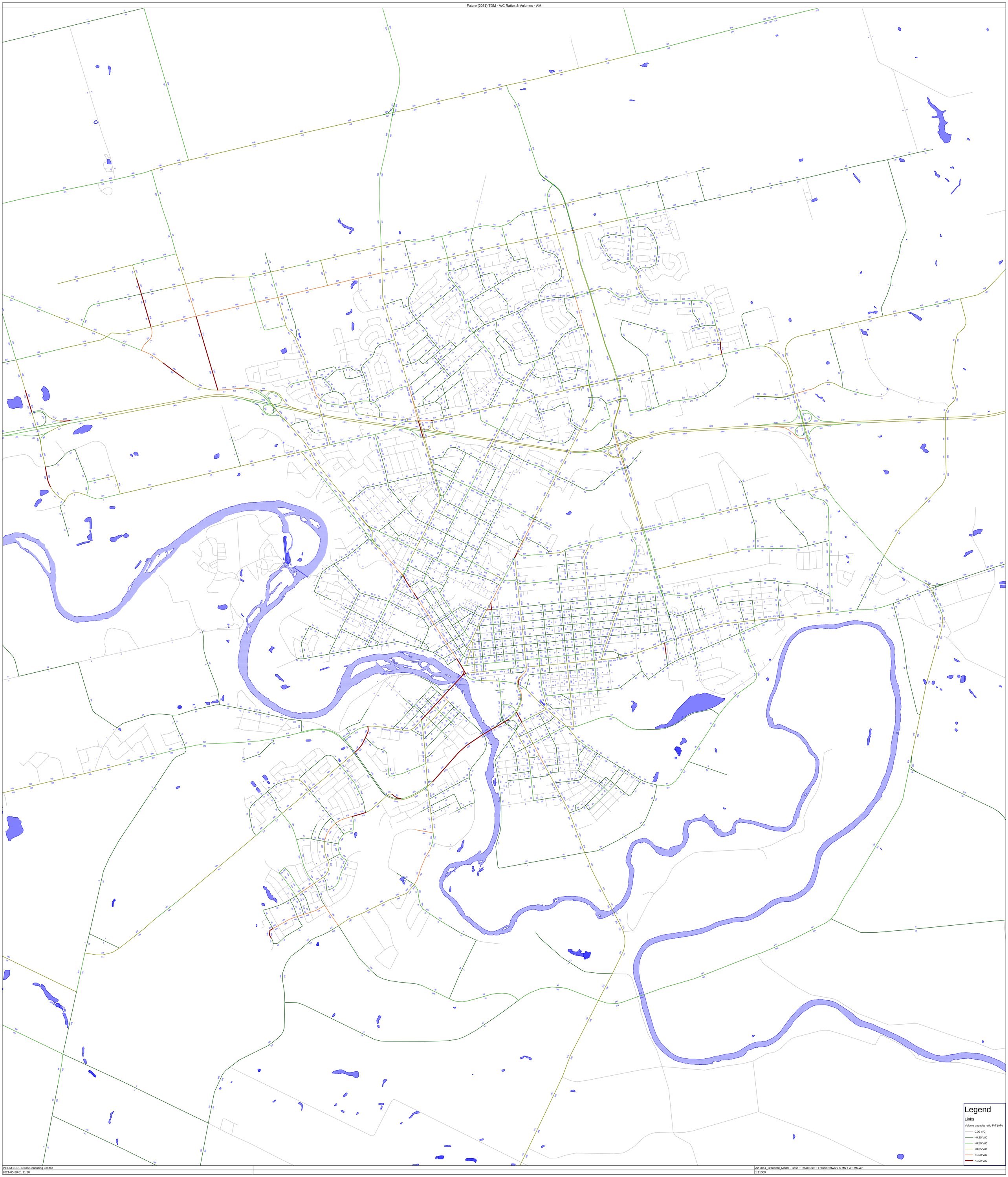
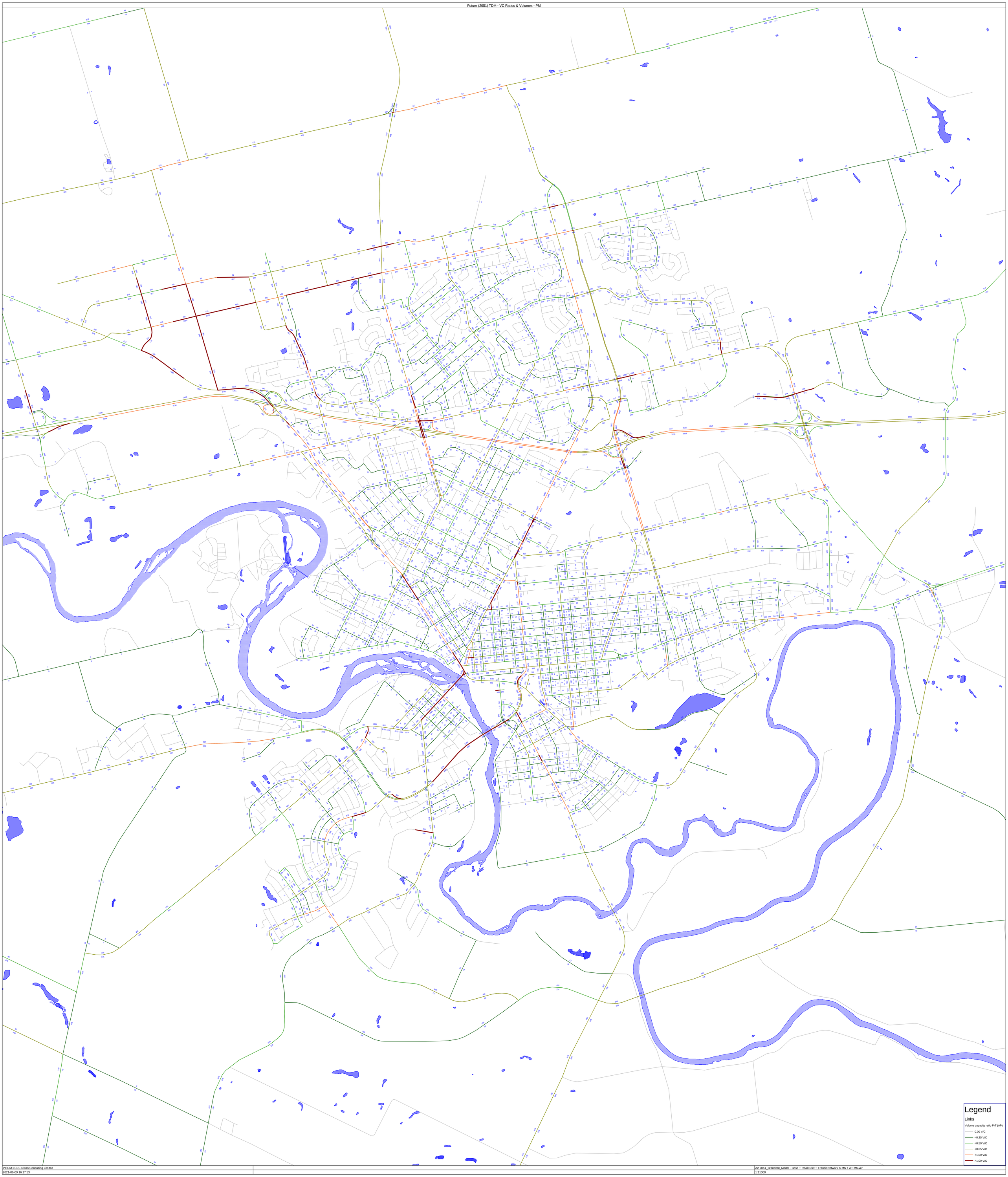
Future (2051) TDM - V/C Ratios & Volumes - AM



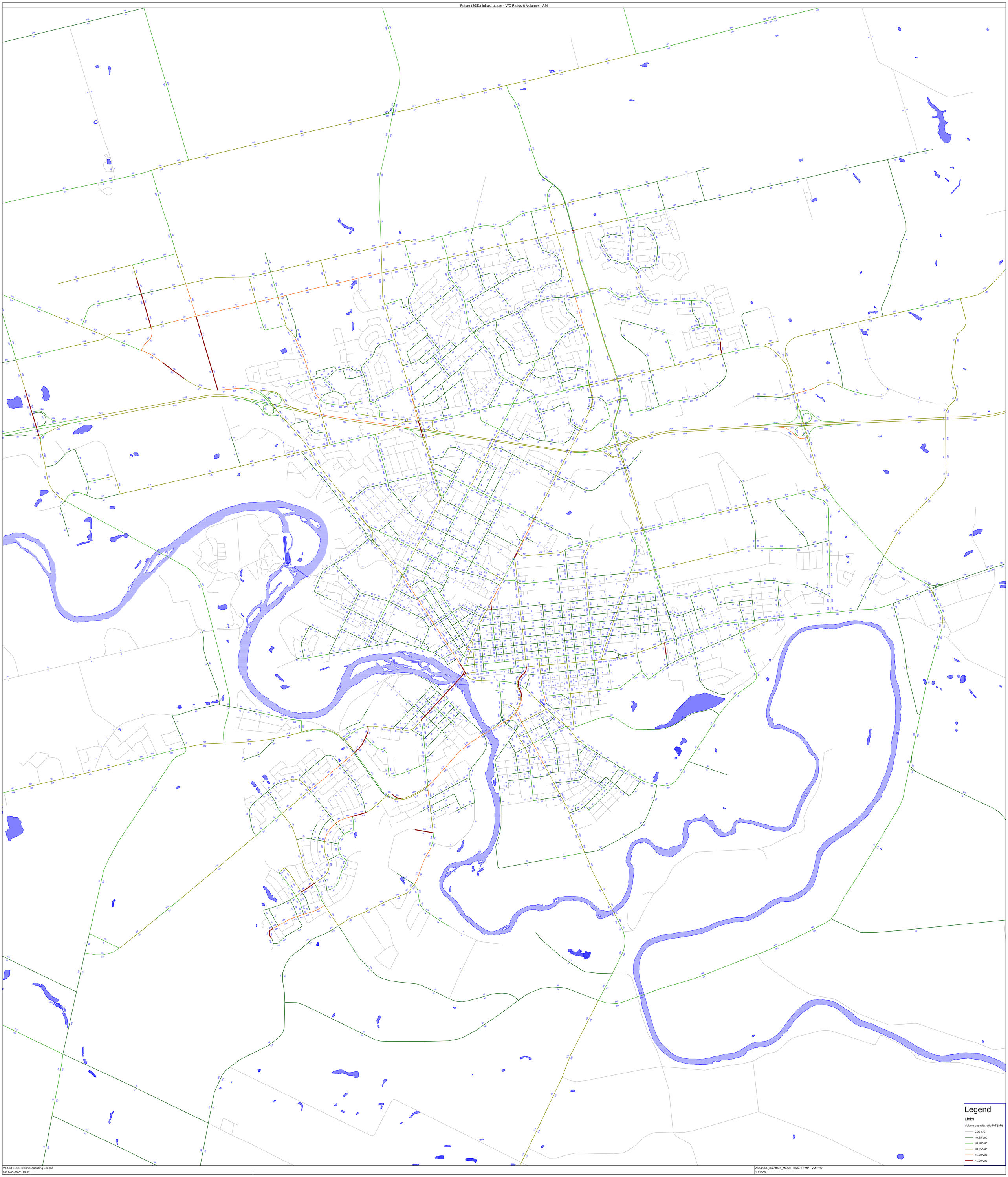
VISUM 21.01, Dillon Consulting Limited		A2 2051_Brantford_Model - Base + Road Diet + Transit Network & MS + AT MS.ver
2021-05-28 01:11:30		1:11000

Future (2051) TDM - VC Ratios & Volumes - PM



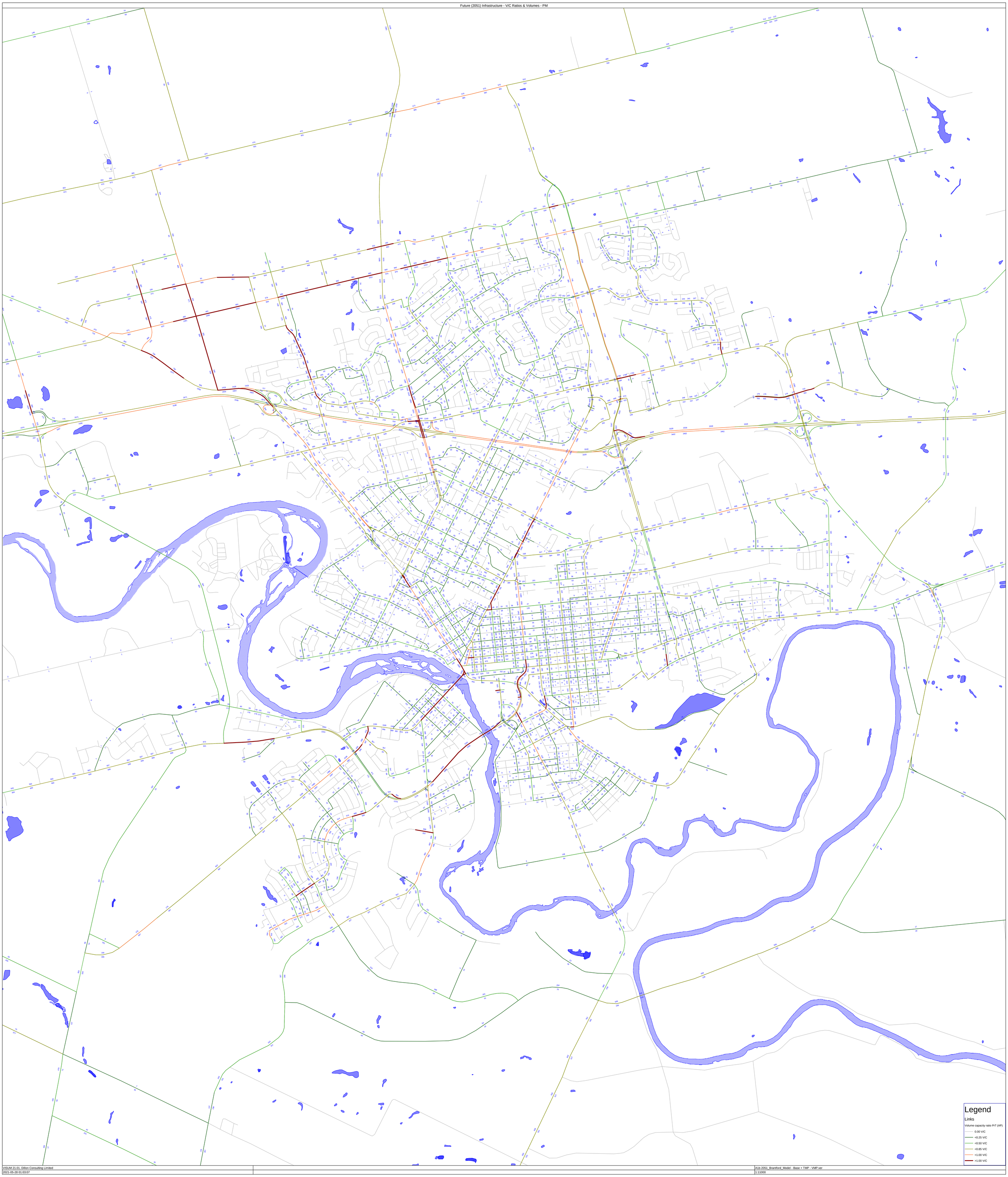
VISUM 21.01, Dillon Consulting Limited		A2 2051_Brantford_Model - Base + Road Diet + Transit Network & MS + AT MS.ver
2021-06-09 16:17:53		1:11000

Future (2051) Infrastructure - V/C Ratios & Volumes - AM



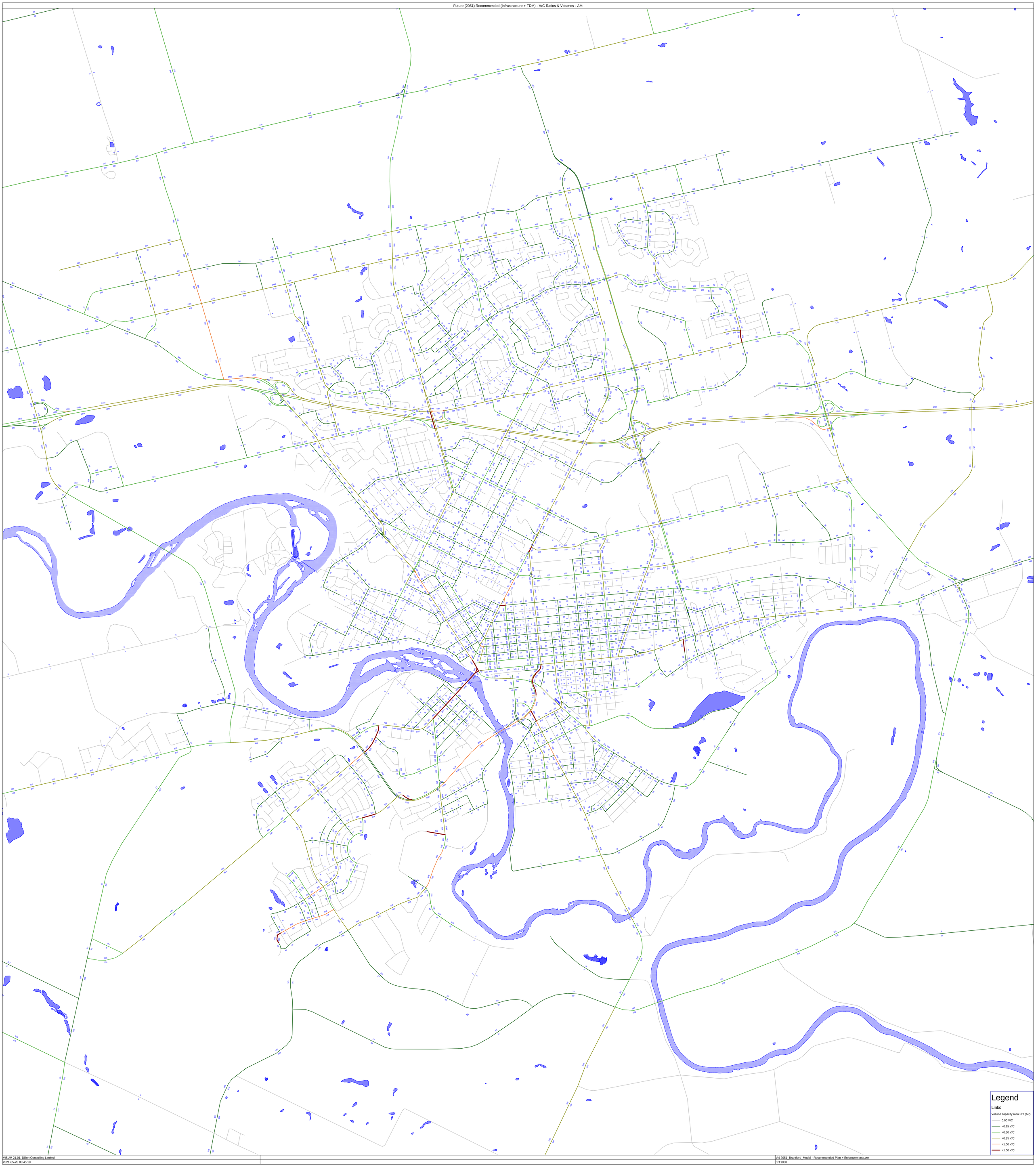
VISUM 21.01, Dillon Consulting Limited		A1b 2051_Brantford_Model - Base + TMP - VMP.ver
2021-05-28 01:19:52		1:11000

Future (2051) Infrastructure - V/C Ratios & Volumes - PM



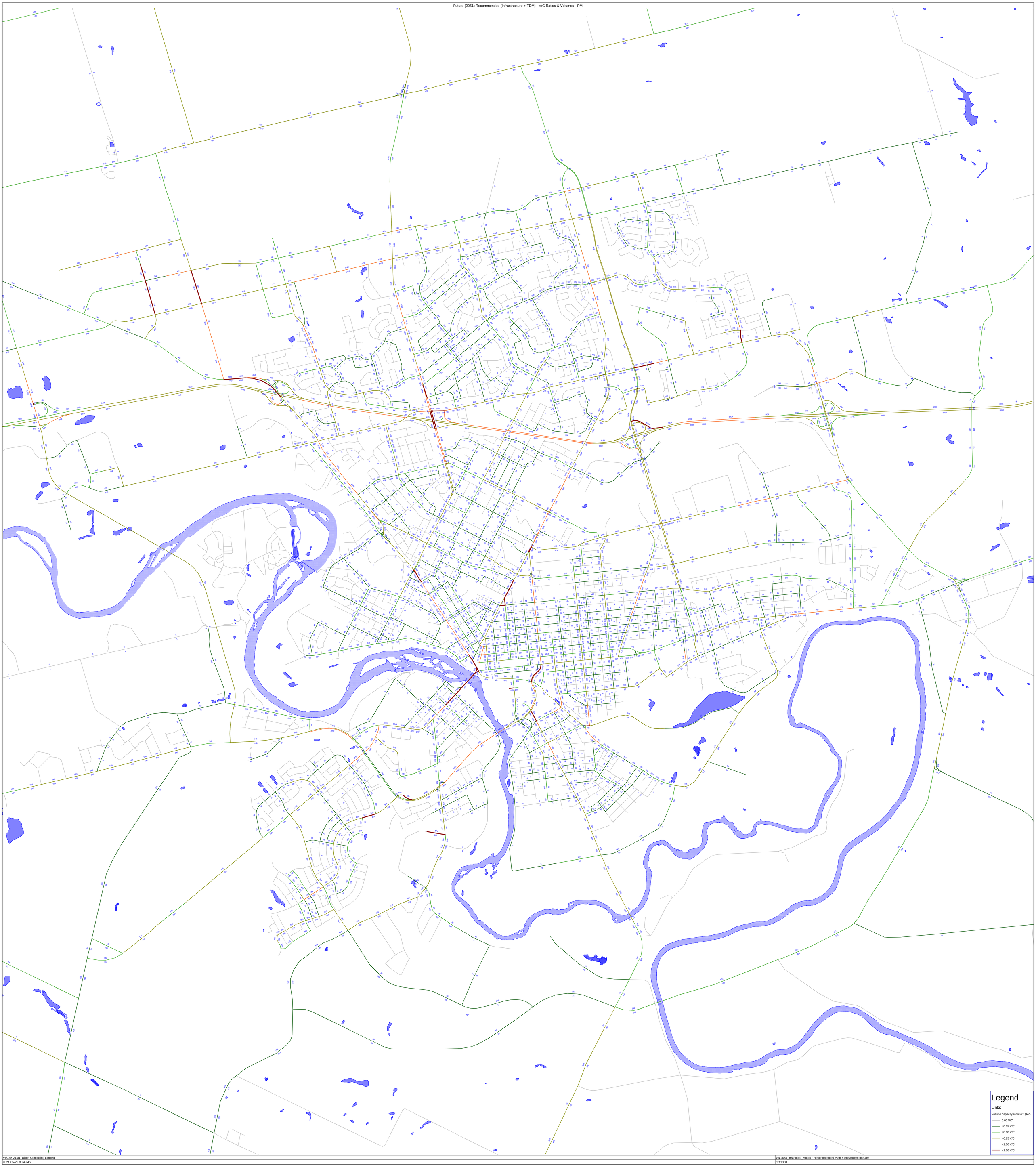
VISUM 21.01, Dillon Consulting Limited		A1b 2051_Brantford_Model - Base + TMP - VMP.ver
2021-05-28 01:03:07		1:11000

Future (2051) Recommended (Infrastructure + TDM) - V/C Ratios & Volumes - AM



VISUM 21.01, Dillon Consulting Limited		A4 2051_Brantford_Model - Recommended Plan + Enhancements.ver
2021-05-28 00:45:10		1:11000

Future (2051) Recommended (Infrastructure + TDM) - V/C Ratios & Volumes - PM



VISUM 21.01, Dillon Consulting Limited		A4 2051_Brantford_Model - Recommended Plan + Enhancements.ver
2021-05-28 00:48:46		1:11000

Appendix C

Screenline Summary

Future 'Do Minimal' Screenline Summary

2051

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	7	8,100	6,752	0.83	6,199	0.77
1	Grand River South	WB	7	8,100	4,433	0.55	7,639	0.94
2	Grand River North	EB	4	5,200	3,176	0.61	4,185	0.80
2	Grand River North	WB	5	6,000	2,779	0.46	3,918	0.65
3	Highway 403	NB	13	10,800	7,023	0.65	9,262	0.86
3	Highway 403	SB	13	10,800	7,463	0.69	9,431	0.87
4	King George Road	EB	11	9,600	5,254	0.55	8,699	0.91
4	King George Road	WB	11	9,600	6,998	0.73	7,417	0.77
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,518	0.59	6,592	0.87
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,604	0.74	5,969	0.79
6	Wayne Gretzky Parkway (South)	EB	7	4,900	1,950	0.40	2,336	0.48
6	Wayne Gretzky Parkway (South)	WB	7	4,900	1,621	0.33	2,802	0.57
7	Memorial Drive	EB	9	6,100	1,670	0.27	3,158	0.52
7	Memorial Drive	WB	9	6,100	2,434	0.40	2,690	0.44
8	West Street	EB	6	4,300	2,165	0.50	3,109	0.72
8	West Street	WB	6	4,300	2,661	0.62	3,076	0.72
9	CNR Corridor	NB	11	7,900	4,413	0.56	5,190	0.66
9	CNR Corridor	SB	11	7,900	4,398	0.56	6,196	0.78
10	Garden Avenue	EB	9	8,800	4,717	0.54	6,071	0.69
10	Garden Avenue	WB	9	8,800	4,646	0.53	6,236	0.71
11	Powerline Road	NB	13	9,400	4,243	0.45	6,005	0.64
11	Powerline Road	SB	13	9,400	4,807	0.51	6,360	0.68
12	Murray Street	EB	7	4,400	2,131	0.48	1,965	0.45
12	Murray Street	WB	8	5,200	1,657	0.32	2,623	0.50
13	West External	EB	7	7,300	1,707	0.23	2,286	0.31
13	West External	WB	7	7,300	1,681	0.23	2,249	0.31
14	South-West External	NB	4	4,300	1,560	0.36	1,201	0.28
14	South-West External	SB	4	4,300	960	0.22	1,622	0.38
15	East External	EB	5	6,900	3,152	0.46	3,828	0.55
15	East External	WB	5	6,900	3,298	0.48	3,948	0.57
16	North-East External	NB	3	3,200	1,444	0.45	1,729	0.54
16	North-East External	SB	3	3,200	1,254	0.39	2,347	0.73
17	North-West External	NB	3	3,300	809	0.25	931	0.28
17	North-West External	SB	3	3,300	800	0.24	1,000	0.30

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	1	Direction
Name	Grand River South	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	8,100	6,752	0.83	6,199	0.77
7	8,100	4,433	0.55	7,639	0.94

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,835	0.51	2,274	0.63
2	Highway 403	32103934	WB	1,800	2	3,600	1,628	0.45	2,120	0.59
3	Colborne Street	32102414	EB	800	2	1,600	2,504	1.57	2,026	1.27
4	Colborne Street	32102414	WB	800	2	1,600	1,409	0.88	2,714	1.70
5	Veterans Memorial Parkway	32101861	EB	1,000	1	1,000	1,259	1.26	1,103	1.10
6	Veterans Memorial Parkway	32101861	WB	1,000	1	1,000	988	0.99	1,360	1.36
7	Erie Avenue	32102875	EB	800	1	800	605	0.76	524	0.66
8	Erie Avenue	32102875	WB	800	1	800	257	0.32	665	0.83
9	Phelps Road (Brant Road 18)	31646482	EB	1,100	1	1,100	549	0.50	272	0.25
10	Phelps Road (Brant Road 18)	31646482	WB	1,100	1	1,100	151	0.14	780	0.71
11										
12										
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18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	2	Direction
Name	Grand River North	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	5,200	3,176	0.61	4,185	0.80
5	6,000	2,779	0.46	3,918	0.65

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,835	0.51	2,274	0.63
2	Highway 403	32103934	WB	1,800	2	3,600	1,628	0.45	2,120	0.59
3	Brant Road 2	32103340	EB	800	1	800	534	0.67	1,082	1.35
4	Brant Road 2	32103340	WB	800	1	800	657	0.82	817	1.02
5	William Street	31634058	EB	800	1	800	807	1.01	829	1.04
6	William Street	31634058	WB	800	2	1,600	494	0.31	981	0.61
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8										
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20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	3	Direction
Name	Highway 403	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
13	10,800	7,023	0.65	9,262	0.86
13	10,800	7,463	0.69	9,431	0.87

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32104457	NB	800	2	1,600	390	0.24	639	0.40
2	Oak Park Road	32104457	SB	800	2	1,600	916	0.57	444	0.28
3	Paris Road	32102313	NB	800	2	1,600	1,295	0.81	1,304	0.82
4	Paris Road	32102313	SB	800	2	1,600	685	0.43	1,659	1.04
5	King George Road	31683713	NB	800	2	1,600	1,292	0.81	1,460	0.91
6	King George Road	32102332	SB	800	2	1,600	1,259	0.79	1,524	0.95
7	Wayne Gretzky Parkway	31703983	NB	1,000	2	2,000	1,681	0.84	2,251	1.13
8	Wayne Gretzky Parkway	31703908	SB	1,000	2	2,000	1,846	0.92	2,222	1.11
9	Garden Avenue	32104072	NB	800	2	1,600	1,013	0.63	1,420	0.89
10	Garden Avenue	32104072	SB	800	2	1,600	1,097	0.69	1,483	0.93
11	North Park Street	31689884	NB	800	1	800	294	0.37	737	0.92
12	North Park Street	31689884	SB	800	1	800	489	0.61	718	0.90
13	West Street	31691064	NB	800	2	1,600	1,058	0.66	1,451	0.91
14	West Street	31691064	SB	800	2	1,600	1,171	0.73	1,381	0.86
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	4	Direction
Name	King George Road	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	9600	5254	0.55	8699	0.91
11	9600	6998	0.73	7417	0.77

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31663494	EB	1,000	1	1,000	677	0.68	1,025	1.03
2	Powerline Road	31663494	WB	1,000	1	1,000	950	0.95	893	0.89
3	Oxford Street	31685991	EB	500	1	500	200	0.40	225	0.45
4	Oxford Street	31685991	WB	500	1	500	131	0.26	238	0.48
5	Toll Gate Road	32101902	EB	800	1	800	619	0.77	885	1.11
6	Toll Gate Road	32101902	WB	800	1	800	590	0.74	878	1.10
7	Highway 403	32104048	EB	1,800	2	3,600	1,991	0.55	3,543	0.98
8	Highway 403	32104051	WB	1,800	2	3,600	3,101	0.86	2,774	0.77
9	Queensway Drive	31683036	EB	500	1	500	136	0.27	203	0.41
10	Queensway Drive	31683036	WB	500	1	500	91	0.18	219	0.44
11	St. George Street	31682564	EB	500	1	500	99	0.20	290	0.58
12	St. George Street	31682564	WB	500	1	500	63	0.13	151	0.30
13	Terrace Hill Street	31670392	EB	500	1	500	204	0.41	283	0.57
14	Terrace Hill Street	31670392	WB	500	1	500	158	0.32	270	0.54
15	Brant Avenue	31669648	EB	800	2	1,600	900	0.56	1,592	1.00
16	Brant Avenue	31669648	WB	800	2	1,600	1,446	0.90	1,358	0.85
17	New East/West Road	32104408	EB	600	1	600	428	0.71	653	1.09
18	New East/West Road	32104408	WB	600	1	600	468	0.78	636	1.06
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	5	Direction
Name	Wayne Gretzky Parkway (North)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,600	4,518	0.59	6,592	0.87
7	7,600	5,604	0.74	5,969	0.79

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31711969	EB	1,000	1	1,000	247	0.25	736	0.74
2	Powerline Road	31711969	WB	1,000	1	1,000	731	0.73	484	0.48
3	Dunsdon Street	32102051	EB	800	1	800	282	0.35	566	0.71
4	Dunsdon Street	32102051	WB	800	1	800	441	0.55	337	0.42
5	Lynden Road	32103996	EB	800	2	1,600	1,066	0.67	1,478	0.92
6	Lynden Road	32103996	WB	800	2	1,600	1,102	0.69	1,745	1.09
7	Highway 403	32104061	EB	1,800	2	3,600	2,838	0.79	3,367	0.94
8	Highway 403	32104062	WB	1,800	2	3,600	2,958	0.82	3,263	0.91
9	New East/West Road	32104398	EB	600	1	600	85	0.14	445	0.74
10	New East/West Road	32104398	WB	600	1	600	372	0.62	140	0.23
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12										
13										
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18										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	6	Direction
Name	Wayne Gretzky Parkway (South)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,900	1,950	0.40	2,336	0.48
7	4,900	1,621	0.33	2,802	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	31701117	EB	800	2	1,600	669	0.42	914	0.57
2	Henry Street	31701117	WB	800	2	1,600	631	0.39	1,177	0.74
3	Elgin Street	31702288	EB	600	1	600	417	0.70	289	0.48
4	Elgin Street	31702288	WB	600	1	600	229	0.38	472	0.79
5	Grey Street	31701124	EB	600	1	600	220	0.37	329	0.55
6	Grey Street	31701124	WB	600	1	600	265	0.44	272	0.45
7	Chatham Street	31700439	EB	500	1	500	82	0.16	79	0.16
8	Chatham Street	31700439	WB	500	1	500	35	0.07	109	0.22
9	Colborne Street	31700015	EB	800	2	1,600	562	0.35	725	0.45
10	Colborne Street	31700015	WB	800	2	1,600	461	0.29	772	0.48
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12										
13										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	7	Direction
Name	Memorial Drive	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
9	6,100	1,670	0.27	3,158	0.52
9	6,100	2,434	0.40	2,690	0.44

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Varadi Avenue	32101917	EB	500	1	500	33	0.07	142	0.28
2	Varadi Avenue	32101917	WB	500	1	500	54	0.11	110	0.22
3	Dunsdon Street	31687743	EB	600	2	1,200	214	0.18	305	0.25
4	Dunsdon Street	31687743	WB	600	2	1,200	240	0.20	254	0.21
5	North Park Street	32101953	EB	600	2	1,200	166	0.14	411	0.34
6	North Park Street	32101953	WB	600	2	1,200	399	0.33	394	0.33
7	Fairview Drive	32102031	EB	800	2	1,600	331	0.21	835	0.52
8	Fairview Drive	32102031	WB	800	2	1,600	691	0.43	766	0.48
9	Powerline Road	31688305	EB	1,000	1	1,000	669	0.67	997	1.00
10	Powerline Road	31688305	WB	1,000	1	1,000	820	0.82	828	0.83
11	New East/West Road	32104387	EB	600	1	600	257	0.43	468	0.78
12	New East/West Road	32104387	WB	600	1	600	230	0.38	338	0.56
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14										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	8	Direction
Name	West Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,300	2,165	0.50	3,109	0.72
6	4,300	2,661	0.62	3,076	0.72

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Morton Avenue	31691008	EB	500	1	500	88	0.18	109	0.22
2	Morton Avenue	31691008	WB	500	1	500	136	0.27	186	0.37
3	Charing Cross Street	31689369	EB	800	2	1,600	440	0.28	668	0.42
4	Charing Cross Street	31689369	WB	800	2	1,600	643	0.40	760	0.48
5	Dundas Street	31679012	EB	600	1	600	363	0.61	477	0.80
6	Dundas Street	31679012	WB	600	1	600	203	0.34	385	0.64
7	Brant Avenue	31670814	EB	800	2	1,600	1,274	0.80	1,855	1.16
8	Brant Avenue	31670814	WB	800	2	1,600	1,679	1.05	1,745	1.09
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10										
11										
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16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	9	Direction
Name	CNR Corridor	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	7,900	4,413	0.56	5,190	0.66
11	7,900	4,398	0.56	6,196	0.78

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	St. Paul Avenue	32103535	NB	800	2	1,600	693	0.43	908	0.57
2	St. Paul Avenue	32103535	SB	800	2	1,600	974	0.61	1,002	0.63
3	West Street	31678374	NB	800	1	800	623	0.78	762	0.95
4	West Street	31678374	SB	800	1	800	771	0.96	933	1.17
5	Clarence Street	31678962	NB	800	2	1,600	1,346	0.84	1,438	0.90
6	Clarence Street	31678962	SB	800	2	1,600	1,180	0.74	1,649	1.03
7	Murray Street	31681384	NB	500	1	500	132	0.26	268	0.54
8	Murray Street	31681384	SB	500	1	500	92	0.18	385	0.77
9	Rawdon Street	31698868	NB	500	1	500	277	0.55	226	0.45
10	Rawdon Street	31698868	SB	500	1	500	131	0.26	399	0.80
11	Stanley Street	31698979	NB	500	1	500	403	0.81	390	0.78
12	Stanley Street	31698979	SB	500	1	500	326	0.65	444	0.89
13	Wayne Gretzky Parkway	31700977	NB	900	2	1,800	720	0.40	1,047	0.58
14	Wayne Gretzky Parkway	31700971	SB	900	2	1,800	737	0.41	1,103	0.61
15	Garden Avenue	32079892	NB	600	1	600	219	0.37	151	0.25
16	Garden Avenue	32079892	SB	600	1	600	187	0.31	281	0.47
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	10	Direction
Name	Garden Avenue	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
9	8,800	4,717	0.54	6,071	0.69
9	8,800	4,646	0.53	6,236	0.71

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Lynden Road	31708958	EB	800	2	1,600	750	0.47	1,121	0.70
2	Lynden Road	31708958	WB	800	2	1,600	755	0.47	1,219	0.76
3	Highway 403	32104066	EB	1,800	2	3,600	2,838	0.79	3,367	0.94
4	Highway 403	32104065	WB	1,800	2	3,600	2,958	0.82	3,263	0.91
5	Henry Street	32081112	EB	800	1	800	372	0.47	624	0.78
6	Henry Street	32081112	WB	800	1	800	391	0.49	556	0.70
7	Elgin Street	32079965	EB	600	1	600	99	0.17	199	0.33
8	Elgin Street	32079965	WB	600	1	600	123	0.21	118	0.20
9	Grey Street	32079358	EB	600	1	600	105	0.18	64	0.11
10	Grey Street	32079358	WB	600	1	600	61	0.10	105	0.18
11	Colborne Street	32102783	EB	800	2	1,600	553	0.35	696	0.44
12	Colborne Street	32102783	WB	800	2	1,600	358	0.22	975	0.61
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14										
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	11	Direction
Name	Powerline Road	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
13	9,400	4,243	0.45	6,005	0.64
13	9,400	4,807	0.51	6,360	0.68

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32103349	NB	800	1	800	451	0.56	692	0.87
2	Oak Park Road	32103349	SB	800	1	800	539	0.67	635	0.79
3	Paris Road	32104353	NB	800	1	800	334	0.42	347	0.43
4	Paris Road	32104353	SB	800	1	800	236	0.30	410	0.51
5	Golf Road	32103116	NB	500	1	500	529	1.06	337	0.67
6	Golf Road	32103116	SB	500	1	500	217	0.43	603	1.21
7	Balmoral Drive	32104424	NB	600	1	600	384	0.64	306	0.51
8	Balmoral Drive	32104424	SB	600	1	600	200	0.33	425	0.71
9	King George Road	32101870	NB	800	2	1,600	852	0.53	1,179	0.74
10	King George Road	32101870	SB	800	2	1,600	1,122	0.70	1,276	0.80
11	Memorial Drive	31688335	NB	600	2	1,200	133	0.11	447	0.37
12	Memorial Drive	31688335	SB	600	2	1,200	352	0.29	472	0.39
13	Greenfield Road	31709585	NB	500	1	500	44	0.09	62	0.12
14	Greenfield Road	31709585	SB	500	1	500	35	0.07	39	0.08
15	Wayne Gretzky Parkway	31696170	NB	1,000	2	2,000	836	0.42	1,691	0.85
16	Wayne Gretzky Parkway	32101994	SB	1,000	2	2,000	1,357	0.68	1,574	0.79
17	Brantwood Park Road	32103099	NB	600	1	600	205	0.34	293	0.49
18	Brantwood Park Road	32103099	SB	600	1	600	189	0.32	281	0.47
19	Park Road North	32101996	NB	800	1	800	475	0.59	651	0.81
20	Park Road North	32101996	SB	800	1	800	560	0.70	645	0.81

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	12	Direction
Name	Murray Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,400	2,131	0.48	1,965	0.45
8	5,200	1,657	0.32	2,623	0.50

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	32102230	EB	800	1	800	314	0.39	311	0.39
2	Henry Street	32102230	WB	800	1	800	384	0.48	358	0.45
3	Elgin Street	32102140	EB	500	1	500	78	0.16	104	0.21
4	Elgin Street	32102140	WB	500	1	500	172	0.34	210	0.42
5	Grey Street	31680485	EB	500	1	500	78	0.16	184	0.37
6	Grey Street	31680485	WB	500	1	500	80	0.16	101	0.20
7	Colborne Street	31680092	EB	800	2	1,600	968	0.61	951	0.59
8	Dalhousie Street	31680105	WB	800	3	2,400	748	0.31	1,101	0.46
9	Mary Street	31677408	EB	500	1	500	193	0.39	105	0.21
10	Mary Street	31677408	WB	500	1	500	47	0.09	187	0.37
11	Greenwich Street	31677317	EB	500	1	500	500	1.00	310	0.62
12	Greenwich Street	31677317	WB	500	1	500	226	0.45	666	1.33
13										
14										
15										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	13	Direction
Name	West External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,300	1,707	0.23	2,286	0.31
7	7,300	1,681	0.23	2,249	0.31

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Silver Street (Brant Road 52)	31635739	EB	800	1	800	227	0.28	316	0.40
2	Silver Street (Brant Road 52)	31635739	WB	800	1	800	169	0.21	190	0.24
3	Brant Road 2	31627987	EB	800	1	800	326	0.41	254	0.32
4	Brant Road 2	31627987	WB	800	1	800	194	0.24	652	0.82
5	Powerline Road	32103319	EB	500	1	500	52	0.10	58	0.12
6	Powerline Road	32103319	WB	500	1	500	53	0.11	60	0.12
7	Highway 403	32103921	EB	1,800	2	3,600	824	0.23	1,212	0.34
8	Highway 403	32103924	WB	1,800	2	3,600	934	0.26	1,136	0.32
9	Bethel Road	31626662	EB	500	1	500	1	0.00	28	0.06
10	Bethel Road	31626662	WB	500	1	500	0	0.00	0	0.00
11	Colborne Street (Brant Road 53)	32103323	EB	1,100	1	1,100	277	0.25	418	0.38
12	Colborne Street (Brant Road 53)	32103323	WB	1,100	1	1,100	331	0.30	211	0.19
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	14	Direction
Name	South-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	4,300	1,560	0.36	1,201	0.28
4	4,300	960	0.22	1,622	0.38

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Rest Acres Road (Highway 24)	31623575	NB	1,200	1	1,200	383	0.32	245	0.20
2	Rest Acres Road (Highway 24)	31623575	SB	1,200	1	1,200	379	0.32	374	0.31
3	Mount Pleasant Road (Brant Road 24)	31641599	NB	1,000	1	1,000	222	0.22	238	0.24
4	Mount Pleasant Road (Brant Road 24)	31641599	SB	1,000	1	1,000	197	0.20	270	0.27
5	Pleasant Ridge Road (Brant Road 7)	31641036	NB	1,000	1	1,000	145	0.15	99	0.10
6	Pleasant Ridge Road (Brant Road 7)	31641036	SB	1,000	1	1,000	65	0.07	152	0.15
7	Cockshutt Road (Brant Road 4)	32103199	NB	1,100	1	1,100	810	0.74	619	0.56
8	Cockshutt Road (Brant Road 4)	32103199	SB	1,100	1	1,100	319	0.29	826	0.75
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	15	Direction
Name	East External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
5	6,900	3,152	0.46	3,828	0.55
5	6,900	3,298	0.48	3,948	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32104077	EB	1,800	2	3,600	2,484	0.69	3,024	0.84
2	Highway 403	32104074	WB	1,800	2	3,600	2,757	0.77	2,831	0.79
3	Brant Road 2	32087178	EB	1,100	2	2,200	404	0.18	410	0.19
4	Brant Road 2	32087178	WB	1,100	2	2,200	236	0.11	738	0.34
5	Brant Road 54	32079101	EB	1,100	1	1,100	264	0.24	394	0.36
6	Brant Road 54	32079101	WB	1,100	1	1,100	305	0.28	379	0.34
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	16	Direction
Name	North-East External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,200	1,444	0.45	1,729	0.54
3	3,200	1,254	0.39	2,347	0.73

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	East River Road	31664248	NB	1,000	1	1,000	303	0.30	213	0.21
2	East River Road	31664248	SB	1,000	1	1,000	121	0.12	525	0.53
3	Highway 24	32104116	NB	1,200	1	1,200	796	0.66	1,002	0.84
4	Highway 24	32104116	SB	1,200	1	1,200	639	0.53	1,136	0.95
5	St. George Road	31864585	NB	1,000	1	1,000	345	0.35	514	0.51
6	St. George Road	31864585	SB	1,000	1	1,000	494	0.49	686	0.69
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	17	Direction
Name	North-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,300	809	0.25	931	0.28
3	3,300	800	0.24	1,000	0.30

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Brant-Oxford Road	31625759	NB	1,100	1	1,100	288	0.26	217	0.20
2	Brant-Oxford Road	31625759	SB	1,100	1	1,100	274	0.25	285	0.26
3	Ayr Road	31626456	NB	1,100	1	1,100	3	0.00	5	0.00
4	Ayr Road	31626456	SB	1,100	1	1,100	3	0.00	23	0.02
5	Pinehurst Road	32103147	NB	1,100	1	1,100	518	0.47	709	0.64
6	Pinehurst Road	32103147	SB	1,100	1	1,100	523	0.48	692	0.63
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Future Manage Travel Demand Screenline Summary

2051

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	7	8,100	6,509	0.80	5,926	0.73
1	Grand River South	WB	7	8,100	4,145	0.51	7,179	0.89
2	Grand River North	EB	4	5,200	3,012	0.58	4,039	0.78
2	Grand River North	WB	5	6,000	2,586	0.43	3,697	0.62
3	Highway 403	NB	13	10,800	6,521	0.60	8,655	0.80
3	Highway 403	SB	13	10,800	7,141	0.66	8,912	0.83
4	King George Road	EB	11	9,600	5,030	0.52	8,319	0.87
4	King George Road	WB	11	9,600	6,599	0.69	6,890	0.72
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,379	0.58	6,331	0.83
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,464	0.72	5,774	0.76
6	Wayne Gretzky Parkway (South)	EB	6	4,100	1,854	0.45	2,154	0.53
6	Wayne Gretzky Parkway (South)	WB	6	4,100	1,468	0.36	2,664	0.65
7	Memorial Drive	EB	7	4,900	1,573	0.32	2,898	0.59
7	Memorial Drive	WB	7	4,900	2,269	0.46	2,398	0.49
8	West Street	EB	6	4,300	2,010	0.47	3,027	0.70
8	West Street	WB	6	4,300	2,581	0.60	3,054	0.71
9	CNR Corridor	NB	11	7,900	4,115	0.52	4,873	0.62
9	CNR Corridor	SB	11	7,900	4,093	0.52	5,895	0.75
10	Garden Avenue	EB	8	8,000	4,593	0.57	5,781	0.72
10	Garden Avenue	WB	8	8,000	4,574	0.57	6,013	0.75
11	Powerline Road	NB	12	9,000	4,008	0.45	5,741	0.64
11	Powerline Road	SB	12	9,000	4,617	0.51	5,978	0.66
12	Murray Street	EB	7	4,400	2,095	0.48	1,846	0.42
12	Murray Street	WB	8	5,200	1,570	0.30	2,497	0.48
13	West External	EB	7	7,300	1,667	0.23	2,259	0.31
13	West External	WB	7	7,300	1,615	0.22	2,179	0.30
14	South-West External	NB	4	4,300	1,546	0.36	1,186	0.28
14	South-West External	SB	4	4,300	942	0.22	1,644	0.38
15	East External	EB	5	6,900	3,162	0.46	3,825	0.55
15	East External	WB	5	6,900	3,304	0.48	3,960	0.57
16	North-East External	NB	3	3,200	1,430	0.45	1,712	0.54
16	North-East External	SB	3	3,200	1,245	0.39	2,325	0.73
17	North-West External	NB	3	3,300	774	0.23	920	0.28
17	North-West External	SB	3	3,300	796	0.24	955	0.29

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	1	Direction
Name	Grand River South	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	8,100	6,509	0.80	5,926	0.73
7	8,100	4,145	0.51	7,179	0.89

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,720	0.48	2,179	0.61
2	Highway 403	32103934	WB	1,800	2	3,600	1,505	0.42	1,984	0.55
3	Colborne Street	32102414	EB	800	2	1,600	2,457	1.54	1,918	1.20
4	Colborne Street	32102414	WB	800	2	1,600	1,269	0.79	2,570	1.61
5	Veterans Memorial Parkway	32101861	EB	1,000	1	1,000	1,251	1.25	1,067	1.07
6	Veterans Memorial Parkway	32101861	WB	1,000	1	1,000	969	0.97	1,328	1.33
7	Erie Avenue	32102875	EB	800	1	800	577	0.72	507	0.63
8	Erie Avenue	32102875	WB	800	1	800	255	0.32	611	0.76
9	Phelps Road (Brant Road 18)	31646482	EB	1,100	1	1,100	504	0.46	255	0.23
10	Phelps Road (Brant Road 18)	31646482	WB	1,100	1	1,100	147	0.13	686	0.62
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	2	Direction
Name	Grand River North	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	5,200	3,012	0.58	4,039	0.78
5	6,000	2,586	0.43	3,697	0.62

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,720	0.48	2,179	0.61
2	Highway 403	32103934	WB	1,800	2	3,600	1,505	0.42	1,984	0.55
3	Brant Road 2	32103340	EB	800	1	800	485	0.61	1,066	1.33
4	Brant Road 2	32103340	WB	800	1	800	613	0.77	746	0.93
5	William Street	31634058	EB	800	1	800	807	1.01	794	0.99
6	William Street	31634058	WB	800	2	1,600	468	0.29	967	0.60
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	3	Direction
Name	Highway 403	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
13	10,800	6,521	0.60	8,655	0.80
13	10,800	7,141	0.66	8,912	0.83

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32104460	NB	800	2	1,600	365	0.23	540	0.34
2	Oak Park Road	32104460	SB	800	2	1,600	882	0.55	371	0.23
3	Paris Road	32102313	NB	800	2	1,600	1,201	0.75	1,159	0.72
4	Paris Road	32102313	SB	800	2	1,600	636	0.40	1,622	1.01
5	King George Road	31683713	NB	800	2	1,600	1,237	0.77	1,422	0.89
6	King George Road	32102332	SB	800	2	1,600	1,219	0.76	1,454	0.91
7	Wayne Gretzky Parkway	31703983	NB	1,000	2	2,000	1,583	0.79	2,176	1.09
8	Wayne Gretzky Parkway	31703908	SB	1,000	2	2,000	1,813	0.91	2,193	1.10
9	Garden Avenue	32104072	NB	800	2	1,600	908	0.57	1,361	0.85
10	Garden Avenue	32104072	SB	800	2	1,600	1,045	0.65	1,393	0.87
11	North Park Street	31689884	NB	800	1	800	273	0.34	628	0.79
12	North Park Street	31689884	SB	800	1	800	445	0.56	618	0.77
13	West Street	31691064	NB	800	2	1,600	954	0.60	1,369	0.86
14	West Street	31691064	SB	800	2	1,600	1,101	0.69	1,261	0.79
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	4	Direction
Name	King George Road	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	9600	5030	0.52	8319	0.87
11	9600	6599	0.69	6890	0.72

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31663494	EB	1,000	1	1,000	674	0.67	1,022	1.02
2	Powerline Road	31663494	WB	1,000	1	1,000	930	0.93	878	0.88
3	Oxford Street	31685991	EB	500	1	500	187	0.37	224	0.45
4	Oxford Street	31685991	WB	500	1	500	130	0.26	230	0.46
5	Toll Gate Road	32101902	EB	800	1	800	590	0.74	762	0.95
6	Toll Gate Road	32101902	WB	800	1	800	509	0.64	751	0.94
7	Highway 403	32104048	EB	1,800	2	3,600	1,922	0.53	3,449	0.96
8	Highway 403	32104051	WB	1,800	2	3,600	2,965	0.82	2,664	0.74
9	Queensway Drive	31683036	EB	500	1	500	124	0.25	201	0.40
10	Queensway Drive	31683036	WB	500	1	500	83	0.17	209	0.42
11	St. George Street	31682564	EB	500	1	500	79	0.16	226	0.45
12	St. George Street	31682564	WB	500	1	500	49	0.10	122	0.24
13	Terrace Hill Street	31670392	EB	500	1	500	197	0.39	270	0.54
14	Terrace Hill Street	31670392	WB	500	1	500	136	0.27	259	0.52
15	Brant Avenue	31669648	EB	800	2	1,600	840	0.53	1,529	0.96
16	Brant Avenue	31669648	WB	800	2	1,600	1,365	0.85	1,179	0.74
17	New East/West Road	32104408	EB	600	1	600	417	0.70	636	1.06
18	New East/West Road	32104408	WB	600	1	600	432	0.72	598	1.00
19										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	5	Direction
Name	Wayne Gretzky Parkway (North)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,600	4,379	0.58	6,331	0.83
7	7,600	5,464	0.72	5,774	0.76

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31711969	EB	1,000	1	1,000	215	0.22	674	0.67
2	Powerline Road	31711969	WB	1,000	1	1,000	706	0.71	435	0.44
3	Dunsdon Street	32102051	EB	800	1	800	274	0.34	527	0.66
4	Dunsdon Street	32102051	WB	800	1	800	420	0.53	310	0.39
5	Lynden Road	32103996	EB	800	2	1,600	966	0.60	1,364	0.85
6	Lynden Road	32103996	WB	800	2	1,600	1,010	0.63	1,681	1.05
7	Highway 403	32104061	EB	1,800	2	3,600	2,855	0.79	3,333	0.93
8	Highway 403	32104062	WB	1,800	2	3,600	2,979	0.83	3,217	0.89
9	New East/West Road	32104398	EB	600	1	600	69	0.12	433	0.72
10	New East/West Road	32104398	WB	600	1	600	349	0.58	131	0.22
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	6	Direction
Name	Wayne Gretzky Parkway (South)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,100	1,854	0.45	2,154	0.53
6	4,100	1,468	0.36	2,664	0.65

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	31701117	EB	800	2	1,600	629	0.39	830	0.52
2	Henry Street	31701117	WB	800	2	1,600	530	0.33	1,173	0.73
3	Elgin Street	31702288	EB	600	1	600	414	0.69	267	0.45
4	Elgin Street	31702288	WB	600	1	600	212	0.35	486	0.81
5	Grey Street	31701124	EB	600	1	600	214	0.36	346	0.58
6	Grey Street	31701124	WB	600	1	600	266	0.44	302	0.50
7	Chatham Street	31700439	EB	500	1	500	76	0.15	130	0.26
8	Chatham Street	31700439	WB	500	1	500	31	0.06	147	0.29
9	Colborne Street	31700015	EB	800	1	800	521	0.65	581	0.73
10	Colborne Street	31700015	WB	800	1	800	429	0.54	556	0.70
11										
12										
13										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	7	Direction
Name	Memorial Drive	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,900	1,573	0.32	2,898	0.59
7	4,900	2,269	0.46	2,398	0.49

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Varadi Avenue	32101917	EB	500	1	500	33	0.07	140	0.28
2	Varadi Avenue	32101917	WB	500	1	500	39	0.08	108	0.22
3	Dunsdon Street	31687743	EB	600	2	1,200	202	0.17	338	0.28
4	Dunsdon Street	31687743	WB	600	2	1,200	270	0.23	279	0.23
5	North Park Street	32101953	EB	800	1	800	158	0.20	428	0.54
6	North Park Street	32101953	WB	800	1	800	361	0.45	346	0.43
7	Fairview Drive	32102031	EB	800	1	800	302	0.38	545	0.68
8	Fairview Drive	32102031	WB	800	1	800	559	0.70	538	0.67
9	Powerline Road	31688305	EB	1,000	1	1,000	632	0.63	992	0.99
10	Powerline Road	31688305	WB	1,000	1	1,000	835	0.84	831	0.83
11	New East/West Road	32104387	EB	600	1	600	246	0.41	455	0.76
12	New East/West Road	32104387	WB	600	1	600	205	0.34	296	0.49
13										
14										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	8	Direction
Name	West Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,300	2,010	0.47	3,027	0.70
6	4,300	2,581	0.60	3,054	0.71

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Morton Avenue	31691008	EB	500	1	500	85	0.17	124	0.25
2	Morton Avenue	31691008	WB	500	1	500	132	0.26	186	0.37
3	Charing Cross Street	31689369	EB	800	2	1,600	431	0.27	678	0.42
4	Charing Cross Street	31689369	WB	800	2	1,600	626	0.39	882	0.55
5	Dundas Street	31679012	EB	600	1	600	320	0.53	451	0.75
6	Dundas Street	31679012	WB	600	1	600	184	0.31	316	0.53
7	Brant Avenue	31670814	EB	800	2	1,600	1,174	0.73	1,774	1.11
8	Brant Avenue	31670814	WB	800	2	1,600	1,639	1.02	1,670	1.04
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11										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	9	Direction
Name	CNR Corridor	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	7,900	4,115	0.52	4,873	0.62
11	7,900	4,093	0.52	5,895	0.75

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	St. Paul Avenue	32103535	NB	800	2	1,600	655	0.41	953	0.60
2	St. Paul Avenue	32103535	SB	800	2	1,600	912	0.57	1,017	0.64
3	West Street	31678374	NB	800	1	800	621	0.78	742	0.93
4	West Street	31678374	SB	800	1	800	745	0.93	931	1.16
5	Clarence Street	31678962	NB	800	2	1,600	1,269	0.79	1,349	0.84
6	Clarence Street	31678962	SB	800	2	1,600	1,089	0.68	1,577	0.99
7	Murray Street	31681384	NB	500	1	500	102	0.20	183	0.37
8	Murray Street	31681384	SB	500	1	500	89	0.18	355	0.71
9	Rawdon Street	31698868	NB	500	1	500	248	0.50	157	0.31
10	Rawdon Street	31698868	SB	500	1	500	104	0.21	376	0.75
11	Stanley Street	31698979	NB	500	1	500	399	0.80	382	0.76
12	Stanley Street	31698979	SB	500	1	500	296	0.59	432	0.86
13	Wayne Gretzky Parkway	31700977	NB	900	2	1,800	639	0.36	981	0.55
14	Wayne Gretzky Parkway	31700971	SB	900	2	1,800	682	0.38	996	0.55
15	Garden Avenue	32079892	NB	600	1	600	182	0.30	126	0.21
16	Garden Avenue	32079892	SB	600	1	600	176	0.29	211	0.35
17										
18										
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	10	Direction
Name	Garden Avenue	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
8	8,000	4,593	0.57	5,781	0.72
8	8,000	4,574	0.57	6,013	0.75

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Lynden Road	31708958	EB	800	2	1,600	688	0.43	1,016	0.64
2	Lynden Road	31708958	WB	800	2	1,600	733	0.46	1,211	0.76
3	Highway 403	32104066	EB	1,800	2	3,600	2,855	0.79	3,333	0.93
4	Highway 403	32104065	WB	1,800	2	3,600	2,979	0.83	3,217	0.89
5	Henry Street	32081112	EB	800	1	800	335	0.42	588	0.74
6	Henry Street	32081112	WB	800	1	800	359	0.45	527	0.66
7	Elgin Street	32079965	EB	600	1	600	99	0.17	168	0.28
8	Elgin Street	32079965	WB	600	1	600	98	0.16	139	0.23
9	Grey Street	32079358	EB	600	1	600	105	0.18	71	0.12
10	Grey Street	32079358	WB	600	1	600	61	0.10	155	0.26
11	Colborne Street	32102783	EB	800	1	800	511	0.64	605	0.76
12	Colborne Street	32102783	WB	800	1	800	344	0.43	764	0.96
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	11	Direction
Name	Powerline Road	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
12	9,000	4,008	0.45	5,741	0.64
12	9,000	4,617	0.51	5,978	0.66

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32103349	NB	800	1	800	483	0.60	668	0.84
2	Oak Park Road	32103349	SB	800	1	800	526	0.66	607	0.76
3	Paris Road	32104353	NB	800	1	800	297	0.37	313	0.39
4	Paris Road	32104353	SB	800	1	800	224	0.28	339	0.42
5	Golf Road	32103116	NB	500	1	500	514	1.03	301	0.60
6	Golf Road	32103116	SB	500	1	500	198	0.40	590	1.18
7	Balmoral Drive	32104424	NB	600	1	600	358	0.60	303	0.51
8	Balmoral Drive	32104424	SB	600	1	600	181	0.30	422	0.70
9	King George Road	32101870	NB	800	2	1,600	787	0.49	1,158	0.72
10	King George Road	32101870	SB	800	2	1,600	1,110	0.69	1,203	0.75
11	Memorial Drive	31688335	NB	800	1	800	124	0.16	394	0.49
12	Memorial Drive	31688335	SB	800	1	800	302	0.38	412	0.52
13	Greenfield Road	31709585	NB	500	1	500	40	0.08	63	0.13
14	Greenfield Road	31709585	SB	500	1	500	34	0.07	38	0.08
15	Wayne Gretzky Parkway	31696170	NB	1,000	2	2,000	777	0.39	1,655	0.83
16	Wayne Gretzky Parkway	32101994	SB	1,000	2	2,000	1,323	0.66	1,468	0.73
17	Brantwood Park Road	32103099	NB	600	1	600	197	0.33	271	0.45
18	Brantwood Park Road	32103099	SB	600	1	600	175	0.29	272	0.45
19	Park Road North	32101996	NB	800	1	800	431	0.54	615	0.77
20	Park Road North	32101996	SB	800	1	800	544	0.68	627	0.78

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	12	Direction
Name	Murray Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,400	2,095	0.48	1,846	0.42
8	5,200	1,570	0.30	2,497	0.48

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	32102230	EB	800	1	800	325	0.41	304	0.38
2	Henry Street	32102230	WB	800	1	800	368	0.46	456	0.57
3	Elgin Street	32102140	EB	500	1	500	105	0.21	103	0.21
4	Elgin Street	32102140	WB	500	1	500	147	0.29	135	0.27
5	Grey Street	31680485	EB	500	1	500	87	0.17	169	0.34
6	Grey Street	31680485	WB	500	1	500	76	0.15	101	0.20
7	Colborne Street	31680092	EB	800	2	1,600	947	0.59	920	0.58
8	Dalhousie Street	31680105	WB	800	3	2,400	722	0.30	953	0.40
9	Mary Street	31677408	EB	500	1	500	193	0.39	45	0.09
10	Mary Street	31677408	WB	500	1	500	54	0.11	194	0.39
11	Greenwich Street	31677317	EB	500	1	500	438	0.88	305	0.61
12	Greenwich Street	31677317	WB	500	1	500	203	0.41	658	1.32
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	13	Direction
Name	West External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,300	1,667	0.23	2,259	0.31
7	7,300	1,615	0.22	2,179	0.30

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Silver Street (Brant Road 52)	31635739	EB	800	1	800	223	0.28	285	0.36
2	Silver Street (Brant Road 52)	31635739	WB	800	1	800	166	0.21	166	0.21
3	Brant Road 2	31627987	EB	800	1	800	283	0.35	228	0.29
4	Brant Road 2	31627987	WB	800	1	800	196	0.25	600	0.75
5	Powerline Road	32103319	EB	500	1	500	53	0.11	59	0.12
6	Powerline Road	32103319	WB	500	1	500	53	0.11	62	0.12
7	Highway 403	32103921	EB	1,800	2	3,600	832	0.23	1,245	0.35
8	Highway 403	32103924	WB	1,800	2	3,600	939	0.26	1,141	0.32
9	Bethel Road	31626662	EB	500	1	500	0	0.00	28	0.06
10	Bethel Road	31626662	WB	500	1	500	0	0.00	0	0.00
11	Colborne Street (Brant Road 53)	32103323	EB	1,100	1	1,100	276	0.25	414	0.38
12	Colborne Street (Brant Road 53)	32103323	WB	1,100	1	1,100	261	0.24	210	0.19
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	14	Direction
Name	South-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	4,300	1,546	0.36	1,186	0.28
4	4,300	942	0.22	1,644	0.38

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Rest Acres Road (Highway 24)	31623575	NB	1,200	1	1,200	399	0.33	237	0.20
2	Rest Acres Road (Highway 24)	31623575	SB	1,200	1	1,200	376	0.31	423	0.35
3	Mount Pleasant Road (Brant Road 24)	31641599	NB	1,000	1	1,000	216	0.22	236	0.24
4	Mount Pleasant Road (Brant Road 24)	31641599	SB	1,000	1	1,000	185	0.19	270	0.27
5	Pleasant Ridge Road (Brant Road 7)	31641036	NB	1,000	1	1,000	146	0.15	108	0.11
6	Pleasant Ridge Road (Brant Road 7)	31641036	SB	1,000	1	1,000	64	0.06	150	0.15
7	Cockshutt Road (Brant Road 4)	32103199	NB	1,100	1	1,100	785	0.71	605	0.55
8	Cockshutt Road (Brant Road 4)	32103199	SB	1,100	1	1,100	317	0.29	801	0.73
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	15	Direction
Name	East External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
5	6,900	3,162	0.46	3,825	0.55
5	6,900	3,304	0.48	3,960	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32104077	EB	1,800	2	3,600	2,497	0.69	3,034	0.84
2	Highway 403	32104074	WB	1,800	2	3,600	2,767	0.77	2,906	0.81
3	Brant Road 2	32087178	EB	1,100	2	2,200	405	0.18	405	0.18
4	Brant Road 2	32087178	WB	1,100	2	2,200	236	0.11	677	0.31
5	Brant Road 54	32079101	EB	1,100	1	1,100	260	0.24	386	0.35
6	Brant Road 54	32079101	WB	1,100	1	1,100	301	0.27	377	0.34
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	16	Direction
Name	North-East External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,200	1,430	0.45	1,712	0.54
3	3,200	1,245	0.39	2,325	0.73

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	East River Road	31664248	NB	1,000	1	1,000	300	0.30	210	0.21
2	East River Road	31664248	SB	1,000	1	1,000	88	0.09	512	0.51
3	Highway 24	32104116	NB	1,200	1	1,200	787	0.66	994	0.83
4	Highway 24	32104116	SB	1,200	1	1,200	666	0.56	1,136	0.95
5	St. George Road	31864585	NB	1,000	1	1,000	343	0.34	508	0.51
6	St. George Road	31864585	SB	1,000	1	1,000	491	0.49	677	0.68
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	17	Direction
Name	North-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,300	774	0.23	920	0.28
3	3,300	796	0.24	955	0.29

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Brant-Oxford Road	31625759	NB	1,100	1	1,100	276	0.25	223	0.20
2	Brant-Oxford Road	31625759	SB	1,100	1	1,100	276	0.25	288	0.26
3	Ayr Road	31626456	NB	1,100	1	1,100	2	0.00	5	0.00
4	Ayr Road	31626456	SB	1,100	1	1,100	1	0.00	22	0.02
5	Pinehurst Road	32103147	NB	1,100	1	1,100	496	0.45	692	0.63
6	Pinehurst Road	32103147	SB	1,100	1	1,100	519	0.47	645	0.59
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Future Increase Infrastructure Screenline Summary

2051

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	10	11,100	6,423	0.58	7,305	0.66
1	Grand River South	WB	10	11,100	5,552	0.50	7,559	0.68
2	Grand River North	EB	4	5,200	2,933	0.56	4,290	0.83
2	Grand River North	WB	5	6,000	2,845	0.47	3,729	0.62
3	Highway 403	NB	14	11,800	7,351	0.62	9,334	0.79
3	Highway 403	SB	14	11,800	7,447	0.63	9,902	0.84
4	King George Road	EB	11	9,600	5,225	0.54	8,328	0.87
4	King George Road	WB	11	9,600	6,619	0.69	7,307	0.76
5	Wayne Gretzky Parkway (North)	EB	7	7,600	4,621	0.61	6,653	0.88
5	Wayne Gretzky Parkway (North)	WB	7	7,600	5,619	0.74	6,079	0.80
6	Wayne Gretzky Parkway (South)	EB	7	4,900	1,975	0.40	2,370	0.48
6	Wayne Gretzky Parkway (South)	WB	7	4,900	1,635	0.33	2,947	0.60
7	Memorial Drive	EB	9	6,100	1,684	0.28	3,110	0.51
7	Memorial Drive	WB	9	6,100	2,375	0.39	2,614	0.43
8	West Street	EB	6	4,300	2,130	0.50	3,111	0.72
8	West Street	WB	6	4,300	2,524	0.59	3,195	0.74
9	CNR Corridor	NB	12	8,800	4,419	0.50	5,393	0.61
9	CNR Corridor	SB	12	8,800	4,379	0.50	6,277	0.71
10	Garden Avenue	EB	9	8,800	4,858	0.55	5,982	0.68
10	Garden Avenue	WB	9	8,800	4,649	0.53	6,336	0.72
11	Powerline Road	NB	13	9,400	4,307	0.46	6,015	0.64
11	Powerline Road	SB	13	9,400	4,825	0.51	6,434	0.68
12	Murray Street	EB	7	4,400	2,168	0.49	1,921	0.44
12	Murray Street	WB	8	5,200	1,681	0.32	2,874	0.55
13	West External	EB	7	7,300	1,711	0.23	2,285	0.31
13	West External	WB	7	7,300	1,684	0.23	2,184	0.30
14	South-West External	NB	4	4,300	1,598	0.37	1,251	0.29
14	South-West External	SB	4	4,300	973	0.23	1,749	0.41
15	East External	EB	5	6,900	3,149	0.46	3,827	0.55
15	East External	WB	5	6,900	3,289	0.48	3,951	0.57
16	North-East External	NB	3	3,200	1,444	0.45	1,729	0.54
16	North-East External	SB	3	3,200	1,254	0.39	2,347	0.73
17	North-West External	NB	3	3,300	789	0.24	932	0.28
17	North-West External	SB	3	3,300	800	0.24	998	0.30

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	1	Direction
Name	Grand River South	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
10	11,100	6,423	0.58	7,305	0.66
10	11,100	5,552	0.50	7,559	0.68

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,579	0.44	2,418	0.67
2	Highway 403	32103934	WB	1,800	2	3,600	1,694	0.47	1,974	0.55
3	Oak Park Road	32104240	WB	1,000	2	2,000	903	0.45	364	0.18
4	Oak Park Road	32104240	EB	1,000	2	2,000	178	0.09	963	0.48
5	Colborne Street	32102414	EB	800	2	1,600	1,973	1.23	1,613	1.01
6	Colborne Street	32102414	WB	800	2	1,600	1,228	0.77	2,007	1.25
7	Veterans Memorial Parkway	32101861	EB	1,000	2	2,000	1,863	0.93	1,580	0.79
8	Veterans Memorial Parkway	32101861	WB	1,000	2	2,000	1,315	0.66	2,161	1.08
9	Erie Avenue	32102875	EB	800	1	800	439	0.55	495	0.62
10	Erie Avenue	32102875	WB	800	1	800	266	0.33	494	0.62
11	Phelps Road (Brant Road 18)	31646482	EB	1,100	1	1,100	391	0.36	236	0.21
12	Phelps Road (Brant Road 18)	31646482	WB	1,100	1	1,100	146	0.13	559	0.51
13										
14										
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	2	Direction
Name	Grand River North	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	5,200	2,933	0.56	4,290	0.83
5	6,000	2,845	0.47	3,729	0.62

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,579	0.44	2,418	0.67
2	Highway 403	32103934	WB	1,800	2	3,600	1,694	0.47	1,974	0.55
3	Brant Road 2	32103340	EB	800	1	800	536	0.67	1,074	1.34
4	Brant Road 2	32103340	WB	800	1	800	666	0.83	795	0.99
5	William Street	31634058	EB	800	1	800	818	1.02	798	1.00
6	William Street	31634058	WB	800	2	1,600	485	0.30	960	0.60
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	3	Direction
Name	Highway 403	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
14	11,800	7,351	0.62	9,334	0.79
14	11,800	7,447	0.63	9,902	0.84

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32104456	NB	800	2	1,600	1,013	0.63	858	0.54
2	Oak Park Road	32104456	SB	800	2	1,600	974	0.61	1,125	0.70
3	Paris Road	32102313	NB	800	2	1,600	1,108	0.69	1,192	0.75
4	Paris Road	32102313	SB	800	2	1,600	640	0.40	1,492	0.93
5	King George Road	31683713	NB	800	2	1,600	1,276	0.80	1,446	0.90
6	King George Road	32102332	SB	800	2	1,600	1,258	0.79	1,470	0.92
7	Wayne Gretzky Parkway	31703983	NB	1,000	3	3,000	1,739	0.58	2,493	0.83
8	Wayne Gretzky Parkway	31703908	SB	1,000	3	3,000	2,006	0.67	2,505	0.84
9	Garden Avenue	32104072	NB	800	2	1,600	849	0.53	1,277	0.80
10	Garden Avenue	32104072	SB	800	2	1,600	1,022	0.64	1,346	0.84
11	North Park Street	31689884	NB	800	1	800	298	0.37	679	0.85
12	North Park Street	31689884	SB	800	1	800	465	0.58	650	0.81
13	West Street	31691064	NB	800	2	1,600	1,068	0.67	1,389	0.87
14	West Street	31691064	SB	800	2	1,600	1,082	0.68	1,314	0.82
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	4	Direction
Name	King George Road	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	9600	5225	0.54	8328	0.87
11	9600	6619	0.69	7307	0.76

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31663494	EB	1,000	1	1,000	669	0.67	1,011	1.01
2	Powerline Road	31663494	WB	1,000	1	1,000	947	0.95	890	0.89
3	Oxford Street	31685991	EB	500	1	500	201	0.40	224	0.45
4	Oxford Street	31685991	WB	500	1	500	131	0.26	246	0.49
5	Toll Gate Road	32101902	EB	800	1	800	611	0.76	885	1.11
6	Toll Gate Road	32101902	WB	800	1	800	584	0.73	896	1.12
7	Highway 403	32104048	EB	1,800	2	3,600	2,044	0.57	3,525	0.98
8	Highway 403	32104051	WB	1,800	2	3,600	3,074	0.85	2,813	0.78
9	Queensway Drive	31683036	EB	500	1	500	150	0.30	249	0.50
10	Queensway Drive	31683036	WB	500	1	500	98	0.20	291	0.58
11	St. George Street	31682564	EB	500	1	500	80	0.16	164	0.33
12	St. George Street	31682564	WB	500	1	500	42	0.08	103	0.21
13	Terrace Hill Street	31670392	EB	500	1	500	213	0.43	305	0.61
14	Terrace Hill Street	31670392	WB	500	1	500	128	0.26	252	0.50
15	Brant Avenue	31669648	EB	800	2	1,600	832	0.52	1,327	0.83
16	Brant Avenue	31669648	WB	800	2	1,600	1,149	0.72	1,185	0.74
17	New East/West Road	32104408	EB	600	1	600	425	0.71	638	1.06
18	New East/West Road	32104408	WB	600	1	600	466	0.78	631	1.05
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	5	Direction
Name	Wayne Gretzky Parkway (North)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,600	4,621	0.61	6,653	0.88
7	7,600	5,619	0.74	6,079	0.80

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31711969	EB	1,000	1	1,000	244	0.24	733	0.73
2	Powerline Road	31711969	WB	1,000	1	1,000	733	0.73	485	0.49
3	Dunsdon Street	32102051	EB	800	1	800	283	0.35	574	0.72
4	Dunsdon Street	32102051	WB	800	1	800	447	0.56	338	0.42
5	Lynden Road	32103996	EB	800	2	1,600	1,080	0.68	1,495	0.93
6	Lynden Road	32103996	WB	800	2	1,600	1,063	0.66	1,788	1.12
7	Highway 403	32104061	EB	1,800	2	3,600	2,928	0.81	3,402	0.95
8	Highway 403	32104062	WB	1,800	2	3,600	3,006	0.84	3,328	0.92
9	New East/West Road	32104398	EB	600	1	600	86	0.14	449	0.75
10	New East/West Road	32104398	WB	600	1	600	370	0.62	140	0.23
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	6	Direction
Name	Wayne Gretzky Parkway (South)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,900	1,975	0.40	2,370	0.48
7	4,900	1,635	0.33	2,947	0.60

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	31701117	EB	800	2	1,600	675	0.42	907	0.57
2	Henry Street	31701117	WB	800	2	1,600	629	0.39	1,240	0.78
3	Elgin Street	31702288	EB	600	1	600	420	0.70	320	0.53
4	Elgin Street	31702288	WB	600	1	600	228	0.38	500	0.83
5	Grey Street	31701124	EB	600	1	600	223	0.37	339	0.57
6	Grey Street	31701124	WB	600	1	600	275	0.46	277	0.46
7	Chatham Street	31700439	EB	500	1	500	83	0.17	80	0.16
8	Chatham Street	31700439	WB	500	1	500	36	0.07	109	0.22
9	Colborne Street	31700015	EB	800	2	1,600	574	0.36	724	0.45
10	Colborne Street	31700015	WB	800	2	1,600	467	0.29	821	0.51
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	7	Direction
Name	Memorial Drive	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
9	6,100	1,684	0.28	3,110	0.51
9	6,100	2,375	0.39	2,614	0.43

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Varadi Avenue	32101917	EB	500	1	500	33	0.07	141	0.28
2	Varadi Avenue	32101917	WB	500	1	500	41	0.08	109	0.22
3	Dunsdon Street	31687743	EB	600	2	1,200	214	0.18	309	0.26
4	Dunsdon Street	31687743	WB	600	2	1,200	231	0.19	253	0.21
5	North Park Street	32101953	EB	600	2	1,200	164	0.14	398	0.33
6	North Park Street	32101953	WB	600	2	1,200	390	0.33	351	0.29
7	Fairview Drive	32102031	EB	800	2	1,600	337	0.21	775	0.48
8	Fairview Drive	32102031	WB	800	2	1,600	667	0.42	730	0.46
9	Powerline Road	31688305	EB	1,000	1	1,000	682	0.68	1,010	1.01
10	Powerline Road	31688305	WB	1,000	1	1,000	821	0.82	833	0.83
11	New East/West Road	32104387	EB	600	1	600	254	0.42	477	0.80
12	New East/West Road	32104387	WB	600	1	600	225	0.38	338	0.56
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14										
15										
16										
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18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	8	Direction
Name	West Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,300	2,130	0.50	3,111	0.72
6	4,300	2,524	0.59	3,195	0.74

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Morton Avenue	31691008	EB	500	1	500	82	0.16	114	0.23
2	Morton Avenue	31691008	WB	500	1	500	114	0.23	153	0.31
3	Charing Cross Street	31689369	EB	800	2	1,600	551	0.34	933	0.58
4	Charing Cross Street	31689369	WB	800	2	1,600	700	0.44	1,096	0.69
5	Dundas Street	31679012	EB	600	1	600	311	0.52	373	0.62
6	Dundas Street	31679012	WB	600	1	600	181	0.30	263	0.44
7	Brant Avenue	31670814	EB	800	2	1,600	1,186	0.74	1,691	1.06
8	Brant Avenue	31670814	WB	800	2	1,600	1,529	0.96	1,683	1.05
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	9	Direction
Name	CNR Corridor	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
12	8,800	4,419	0.50	5,393	0.61
12	8,800	4,379	0.50	6,277	0.71

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	St. Paul Avenue	32103535	NB	800	2	1,600	778	0.49	1,003	0.63
2	St. Paul Avenue	32103535	SB	800	2	1,600	939	0.59	1,105	0.69
3	West Street	31678374	NB	800	1	800	618	0.77	741	0.93
4	West Street	31678374	SB	800	1	800	765	0.96	892	1.12
5	Clarence Street	31678962	NB	800	2	1,600	1,269	0.79	1,381	0.86
6	Clarence Street	31678962	SB	800	2	1,600	1,140	0.71	1,546	0.97
7	Murray Street	31681384	NB	500	1	500	100	0.20	228	0.46
8	Murray Street	31681384	SB	500	1	500	92	0.18	339	0.68
9	Rawdon Street	31698868	NB	500	1	500	296	0.59	265	0.53
10	Rawdon Street	31698868	SB	500	1	500	169	0.34	385	0.77
11	Stanley Street	31698979	NB	500	1	500	402	0.80	396	0.79
12	Stanley Street	31698979	SB	500	1	500	335	0.67	445	0.89
13	Wayne Gretzky Parkway	31700977	NB	900	3	2,700	755	0.28	1,144	0.42
14	Wayne Gretzky Parkway	31700971	SB	900	3	2,700	750	0.28	1,302	0.48
15	Garden Avenue	32079892	NB	600	1	600	201	0.34	235	0.39
16	Garden Avenue	32079892	SB	600	1	600	189	0.32	263	0.44
17										
18										
19										
20										

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	10	Direction
Name	Garden Avenue	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
9	8,800	4,858	0.55	5,982	0.68
9	8,800	4,649	0.53	6,336	0.72

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Lynden Road	31708958	EB	800	2	1,600	755	0.47	1,066	0.67
2	Lynden Road	31708958	WB	800	2	1,600	723	0.45	1,226	0.77
3	Highway 403	32104066	EB	1,800	2	3,600	2,928	0.81	3,402	0.95
4	Highway 403	32104065	WB	1,800	2	3,600	3,006	0.84	3,328	0.92
5	Henry Street	32081112	EB	800	1	800	367	0.46	547	0.68
6	Henry Street	32081112	WB	800	1	800	378	0.47	540	0.68
7	Elgin Street	32079965	EB	600	1	600	100	0.17	204	0.34
8	Elgin Street	32079965	WB	600	1	600	120	0.20	129	0.22
9	Grey Street	32079358	EB	600	1	600	97	0.16	64	0.11
10	Grey Street	32079358	WB	600	1	600	63	0.11	103	0.17
11	Colborne Street	32102783	EB	800	2	1,600	611	0.38	699	0.44
12	Colborne Street	32102783	WB	800	2	1,600	359	0.22	1,010	0.63
13										
14										
15										
16										
17										
18										
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	11	Direction
Name	Powerline Road	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
13	9,400	4,307	0.46	6,015	0.64
13	9,400	4,825	0.51	6,434	0.68

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32103349	NB	800	1	800	506	0.63	687	0.86
2	Oak Park Road	32103349	SB	800	1	800	574	0.72	717	0.90
3	Paris Road	32104353	NB	800	1	800	364	0.46	354	0.44
4	Paris Road	32104353	SB	800	1	800	226	0.28	444	0.56
5	Golf Road	32103116	NB	500	1	500	510	1.02	326	0.65
6	Golf Road	32103116	SB	500	1	500	208	0.42	589	1.18
7	Balmoral Drive	32104424	NB	600	1	600	384	0.64	300	0.50
8	Balmoral Drive	32104424	SB	600	1	600	198	0.33	430	0.72
9	King George Road	32101870	NB	800	2	1,600	861	0.54	1,186	0.74
10	King George Road	32101870	SB	800	2	1,600	1,108	0.69	1,232	0.77
11	Memorial Drive	31688335	NB	600	2	1,200	131	0.11	438	0.37
12	Memorial Drive	31688335	SB	600	2	1,200	334	0.28	474	0.40
13	Greenfield Road	31709585	NB	500	1	500	44	0.09	66	0.13
14	Greenfield Road	31709585	SB	500	1	500	35	0.07	39	0.08
15	Wayne Gretzky Parkway	31696170	NB	1,000	2	2,000	825	0.41	1,716	0.86
16	Wayne Gretzky Parkway	32101994	SB	1,000	2	2,000	1,384	0.69	1,574	0.79
17	Brantwood Park Road	32103099	NB	600	1	600	207	0.35	293	0.49
18	Brantwood Park Road	32103099	SB	600	1	600	188	0.31	285	0.48
19	Park Road North	32101996	NB	800	1	800	475	0.59	649	0.81
20	Park Road North	32101996	SB	800	1	800	570	0.71	650	0.81

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	12	Direction
Name	Murray Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,400	2,168	0.49	1,921	0.44
8	5,200	1,681	0.32	2,874	0.55

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	32102230	EB	800	1	800	365	0.46	366	0.46
2	Henry Street	32102230	WB	800	1	800	447	0.56	538	0.67
3	Elgin Street	32102140	EB	500	1	500	85	0.17	79	0.16
4	Elgin Street	32102140	WB	500	1	500	131	0.26	175	0.35
5	Grey Street	31680485	EB	500	1	500	90	0.18	144	0.29
6	Grey Street	31680485	WB	500	1	500	75	0.15	103	0.21
7	Colborne Street	31680092	EB	800	2	1,600	912	0.57	956	0.60
8	Dalhousie Street	31680105	WB	800	3	2,400	739	0.31	1,203	0.50
9	Mary Street	31677408	EB	500	1	500	235	0.47	60	0.12
10	Mary Street	31677408	WB	500	1	500	23	0.05	220	0.44
11	Greenwich Street	31677317	EB	500	1	500	481	0.96	316	0.63
12	Greenwich Street	31677317	WB	500	1	500	266	0.53	635	1.27
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14										
15										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	13	Direction
Name	West External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,300	1,711	0.23	2,285	0.31
7	7,300	1,684	0.23	2,184	0.30

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Silver Street (Brant Road 52)	31635739	EB	800	1	800	227	0.28	304	0.38
2	Silver Street (Brant Road 52)	31635739	WB	800	1	800	169	0.21	190	0.24
3	Brant Road 2	31627987	EB	800	1	800	292	0.37	291	0.36
4	Brant Road 2	31627987	WB	800	1	800	193	0.24	658	0.82
5	Powerline Road	32103319	EB	500	1	500	50	0.10	58	0.12
6	Powerline Road	32103319	WB	500	1	500	53	0.11	63	0.13
7	Highway 403	32103921	EB	1,800	2	3,600	830	0.23	1,286	0.36
8	Highway 403	32103924	WB	1,800	2	3,600	1,022	0.28	1,022	0.28
9	Bethel Road	31626662	EB	500	1	500	0	0.00	31	0.06
10	Bethel Road	31626662	WB	500	1	500	0	0.00	0	0.00
11	Colborne Street (Brant Road 53)	32103323	EB	1,100	1	1,100	312	0.28	315	0.29
12	Colborne Street (Brant Road 53)	32103323	WB	1,100	1	1,100	247	0.22	251	0.23
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	14	Direction
Name	South-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	4,300	1,598	0.37	1,251	0.29
4	4,300	973	0.23	1,749	0.41

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Rest Acres Road (Highway 24)	31623575	NB	1,200	1	1,200	470	0.39	232	0.19
2	Rest Acres Road (Highway 24)	31623575	SB	1,200	1	1,200	375	0.31	508	0.42
3	Mount Pleasant Road (Brant Road 24)	31641599	NB	1,000	1	1,000	221	0.22	311	0.31
4	Mount Pleasant Road (Brant Road 24)	31641599	SB	1,000	1	1,000	212	0.21	243	0.24
5	Pleasant Ridge Road (Brant Road 7)	31641036	NB	1,000	1	1,000	208	0.21	117	0.12
6	Pleasant Ridge Road (Brant Road 7)	31641036	SB	1,000	1	1,000	70	0.07	236	0.24
7	Cockshutt Road (Brant Road 4)	32103199	NB	1,100	1	1,100	699	0.64	591	0.54
8	Cockshutt Road (Brant Road 4)	32103199	SB	1,100	1	1,100	316	0.29	762	0.69
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	15	Direction
Name	East External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
5	6,900	3,149	0.46	3,827	0.55
5	6,900	3,289	0.48	3,951	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32104077	EB	1,800	2	3,600	2,482	0.69	3,044	0.85
2	Highway 403	32104074	WB	1,800	2	3,600	2,750	0.76	2,938	0.82
3	Brant Road 2	32087178	EB	1,100	2	2,200	405	0.18	391	0.18
4	Brant Road 2	32087178	WB	1,100	2	2,200	236	0.11	632	0.29
5	Brant Road 54	32079101	EB	1,100	1	1,100	262	0.24	392	0.36
6	Brant Road 54	32079101	WB	1,100	1	1,100	303	0.28	381	0.35
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	16	Direction
Name	North-East External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,200	1,444	0.45	1,729	0.54
3	3,200	1,254	0.39	2,347	0.73

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	East River Road	31664248	NB	1,000	1	1,000	298	0.30	213	0.21
2	East River Road	31664248	SB	1,000	1	1,000	121	0.12	526	0.53
3	Highway 24	32104116	NB	1,200	1	1,200	800	0.67	998	0.83
4	Highway 24	32104116	SB	1,200	1	1,200	640	0.53	1,136	0.95
5	St. George Road	31864585	NB	1,000	1	1,000	346	0.35	518	0.52
6	St. George Road	31864585	SB	1,000	1	1,000	493	0.49	685	0.69
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	17	Direction
Name	North-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,300	789	0.24	932	0.28
3	3,300	800	0.24	998	0.30

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Brant-Oxford Road	31625759	NB	1,100	1	1,100	268	0.24	218	0.20
2	Brant-Oxford Road	31625759	SB	1,100	1	1,100	274	0.25	285	0.26
3	Ayr Road	31626456	NB	1,100	1	1,100	2	0.00	5	0.00
4	Ayr Road	31626456	SB	1,100	1	1,100	2	0.00	20	0.02
5	Pinehurst Road	32103147	NB	1,100	1	1,100	519	0.47	709	0.64
6	Pinehurst Road	32103147	SB	1,100	1	1,100	524	0.48	693	0.63
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

Future Recommended Screenline Summary

2051

#	Name	Direction	Capacity		AM Peak Hour		PM Peak Hour	
			Lanes	Total	Volume	V/C	Volume	V/C
1	Grand River South	EB	10	11,100	6,813	0.61	6,393	0.58
1	Grand River South	WB	10	11,100	4,376	0.39	7,693	0.69
2	Grand River North	EB	4	5,200	2,825	0.54	4,183	0.80
2	Grand River North	WB	5	6,000	2,738	0.46	3,611	0.60
3	Highway 403	NB	14	12,200	6,912	0.57	8,805	0.72
3	Highway 403	SB	14	12,200	7,177	0.59	9,378	0.77
4	King George Road	EB	12	10,600	5,028	0.47	8,235	0.78
4	King George Road	WB	12	10,600	6,421	0.61	7,052	0.67
5	Wayne Gretzky Parkway (North)	EB	8	8,600	4,444	0.52	6,408	0.75
5	Wayne Gretzky Parkway (North)	WB	8	8,600	5,472	0.64	5,921	0.69
6	Wayne Gretzky Parkway (South)	EB	6	4,100	1,887	0.46	2,186	0.53
6	Wayne Gretzky Parkway (South)	WB	6	4,100	1,496	0.36	2,774	0.68
7	Memorial Drive	EB	8	5,900	1,618	0.27	3,133	0.53
7	Memorial Drive	WB	8	5,900	2,396	0.41	2,491	0.42
8	West Street	EB	6	4,300	1,967	0.46	2,838	0.66
8	West Street	WB	6	4,300	2,359	0.55	3,024	0.70
9	CNR Corridor	NB	11	7,900	4,122	0.52	5,038	0.64
9	CNR Corridor	SB	11	7,900	4,062	0.51	5,843	0.74
10	Garden Avenue	EB	8	8,000	4,705	0.59	5,716	0.71
10	Garden Avenue	WB	8	8,000	4,568	0.57	6,082	0.76
11	Powerline Road	NB	14	11,500	4,634	0.40	6,317	0.55
11	Powerline Road	SB	14	11,500	4,831	0.42	6,609	0.57
12	Murray Street	EB	7	4,400	2,148	0.49	1,750	0.40
12	Murray Street	WB	8	5,200	1,633	0.31	2,707	0.52
13	West External	EB	7	7,300	1,672	0.23	2,301	0.32
13	West External	WB	7	7,300	1,660	0.23	2,153	0.29
14	South-West External	NB	4	4,300	1,581	0.37	1,178	0.27
14	South-West External	SB	4	4,300	942	0.22	1,732	0.40
15	East External	EB	5	6,900	3,160	0.46	3,825	0.55
15	East External	WB	5	6,900	3,302	0.48	3,962	0.57
16	North-East External	NB	3	3,200	1,430	0.45	1,713	0.54
16	North-East External	SB	3	3,200	1,243	0.39	2,329	0.73
17	North-West External	NB	3	3,300	755	0.23	919	0.28
17	North-West External	SB	3	3,300	794	0.24	953	0.29

Legned:	*V/C Range*	*From*	*To*
X	Good Capacity Conditions	0.00	0.70
X	Approaching Capacity Conditions	0.70	0.85
X	Over Capacity Conditions	0.85	-

SCREENLINE DETAILS

2051

Screenline	1	Direction
Name	Grand River South	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
10	11,100	6,813	0.61	6,393	0.58
10	11,100	4,376	0.39	7,693	0.69

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,528	0.42	2,283	0.63
2	Highway 403	32103934	WB	1,800	2	3,600	1,575	0.44	1,899	0.53
3	Oak Park Road	32104456	WB	1,000	2	2,000	173	0.09	1,024	0.51
4	Oak Park Road	32104456	EB	1,000	2	2,000	872	0.44	315	0.16
5	Colborne Street	32102414	EB	800	2	1,600	1,846	1.15	1,574	0.98
6	Colborne Street	32102414	WB	800	2	1,600	1,080	0.68	1,804	1.13
7	Veterans Memorial Parkway	32101861	EB	1,000	2	2,000	1,750	0.88	1,493	0.75
8	Veterans Memorial Parkway	32101861	WB	1,000	2	2,000	1,144	0.57	1,992	1.00
9	Erie Avenue	32102875	EB	800	1	800	439	0.55	503	0.63
10	Erie Avenue	32102875	WB	800	1	800	260	0.33	462	0.58
11	Phelps Road (Brant Road 18)	31646482	EB	1,100	1	1,100	378	0.34	225	0.20
12	Phelps Road (Brant Road 18)	31646482	WB	1,100	1	1,100	144	0.13	512	0.47
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14										
15										
16										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	2	Direction
Name	Grand River North	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	5,200	2,825	0.54	4,183	0.80
5	6,000	2,738	0.46	3,611	0.60

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32103935	EB	1,800	2	3,600	1,528	0.42	2,283	0.63
2	Highway 403	32103934	WB	1,800	2	3,600	1,575	0.44	1,899	0.53
3	Brant Road 2	32103340	EB	800	1	800	495	0.62	1,066	1.33
4	Brant Road 2	32103340	WB	800	1	800	693	0.87	732	0.92
5	William Street	31634058	EB	800	1	800	802	1.00	834	1.04
6	William Street	31634058	WB	800	2	1,600	470	0.29	980	0.61
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	3	Direction
Name	Highway 403	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
14	12,200	6,912	0.57	8,805	0.72
14	12,200	7,177	0.59	9,378	0.77

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32104461	NB	1,000	2	2,000	1,032	0.52	820	0.41
2	Oak Park Road	32104461	SB	1,000	2	2,000	1,010	0.51	1,219	0.61
3	Paris Road	32102313	NB	800	2	1,600	1,033	0.65	1,057	0.66
4	Paris Road	32102313	SB	800	2	1,600	582	0.36	1,340	0.84
5	King George Road	31683713	NB	800	2	1,600	1,201	0.75	1,466	0.92
6	King George Road	32102332	SB	800	2	1,600	1,221	0.76	1,472	0.92
7	Wayne Gretzky Parkway	31703983	NB	1,000	3	3,000	1,619	0.54	2,381	0.79
8	Wayne Gretzky Parkway	31703908	SB	1,000	3	3,000	1,913	0.64	2,387	0.80
9	Garden Avenue	32104072	NB	800	2	1,600	796	0.50	1,197	0.75
10	Garden Avenue	32104072	SB	800	2	1,600	991	0.62	1,204	0.75
11	North Park Street	31689884	NB	800	1	800	267	0.33	552	0.69
12	North Park Street	31689884	SB	800	1	800	426	0.53	535	0.67
13	West Street	31691064	NB	800	2	1,600	964	0.60	1,332	0.83
14	West Street	31691064	SB	800	2	1,600	1,034	0.65	1,221	0.76
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16										
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	4	Direction
Name	King George Road	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
12	10600	5028	0.47	8235	0.78
12	10600	6421	0.61	7052	0.67

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31663494	EB	1,000	2	2,000	743	0.37	1,772	0.89
2	Powerline Road	31663494	WB	1,000	2	2,000	1,394	0.70	1,260	0.63
3	Oxford Street	31685991	EB	500	1	500	185	0.37	210	0.42
4	Oxford Street	31685991	WB	500	1	500	122	0.24	216	0.43
5	Toll Gate Road	32101902	EB	800	1	800	556	0.70	723	0.90
6	Toll Gate Road	32101902	WB	800	1	800	418	0.52	707	0.88
7	Highway 403	32104048	EB	1,800	2	3,600	1,949	0.54	3,339	0.93
8	Highway 403	32104051	WB	1,800	2	3,600	2,916	0.81	2,759	0.77
9	Queensway Drive	31683036	EB	500	1	500	134	0.27	195	0.39
10	Queensway Drive	31683036	WB	500	1	500	91	0.18	244	0.49
11	St. George Street	31682564	EB	500	1	500	56	0.11	118	0.24
12	St. George Street	31682564	WB	500	1	500	33	0.07	86	0.17
13	Terrace Hill Street	31670392	EB	500	1	500	193	0.39	289	0.58
14	Terrace Hill Street	31670392	WB	500	1	500	108	0.22	247	0.49
15	Brant Avenue	31669648	EB	800	2	1,600	787	0.49	1,145	0.72
16	Brant Avenue	31669648	WB	800	2	1,600	1,072	0.67	1,042	0.65
17	New East/West Road	32104408	EB	600	1	600	425	0.71	444	0.74
18	New East/West Road	32104408	WB	600	1	600	267	0.45	491	0.82
19										
20										

Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	5	Direction
Name	Wayne Gretzky Parkway (North)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
8	8,600	4,444	0.52	6,408	0.75
8	8,600	5,472	0.64	5,921	0.69

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Powerline Road	31711969	EB	1,000	2	2,000	223	0.11	753	0.38
2	Powerline Road	31711969	WB	1,000	2	2,000	816	0.41	482	0.24
3	Dunsdon Street	32102051	EB	800	1	800	267	0.33	522	0.65
4	Dunsdon Street	32102051	WB	800	1	800	402	0.50	293	0.37
5	Lynden Road	32103996	EB	800	2	1,600	973	0.61	1,365	0.85
6	Lynden Road	32103996	WB	800	2	1,600	983	0.61	1,709	1.07
7	Highway 403	32104061	EB	1,800	2	3,600	2,913	0.81	3,388	0.94
8	Highway 403	32104062	WB	1,800	2	3,600	2,987	0.83	3,309	0.92
9	New East/West Road	32104398	EB	600	1	600	68	0.11	380	0.63
10	New East/West Road	32104398	WB	600	1	600	284	0.47	128	0.21
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	6	Direction
Name	Wayne Gretzky Parkway (South)	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,100	1,887	0.46	2,186	0.53
6	4,100	1,496	0.36	2,774	0.68

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	31701117	EB	800	2	1,600	643	0.40	836	0.52
2	Henry Street	31701117	WB	800	2	1,600	549	0.34	1,211	0.76
3	Elgin Street	31702288	EB	600	1	600	418	0.70	253	0.42
4	Elgin Street	31702288	WB	600	1	600	212	0.35	502	0.84
5	Grey Street	31701124	EB	600	1	600	223	0.37	359	0.60
6	Grey Street	31701124	WB	600	1	600	273	0.46	315	0.53
7	Chatham Street	31700439	EB	500	1	500	78	0.16	130	0.26
8	Chatham Street	31700439	WB	500	1	500	33	0.07	148	0.30
9	Colborne Street	31700015	EB	800	1	800	525	0.66	608	0.76
10	Colborne Street	31700015	WB	800	1	800	429	0.54	598	0.75
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12										
13										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	7	Direction
Name	Memorial Drive	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
8	5,900	1,618	0.27	3,133	0.53
8	5,900	2,396	0.41	2,491	0.42

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Varadi Avenue	32101917	EB	500	1	500	33	0.07	114	0.23
2	Varadi Avenue	32101917	WB	500	1	500	25	0.05	42	0.08
3	Dunsdon Street	31687743	EB	600	2	1,200	191	0.16	295	0.25
4	Dunsdon Street	31687743	WB	600	2	1,200	216	0.18	269	0.22
5	North Park Street	32101953	EB	800	1	800	157	0.20	358	0.45
6	North Park Street	32101953	WB	800	1	800	347	0.43	299	0.37
7	Fairview Drive	32102031	EB	800	1	800	295	0.37	518	0.65
8	Fairview Drive	32102031	WB	800	1	800	512	0.64	510	0.64
9	Powerline Road	31688305	EB	1,000	2	2,000	701	0.35	1,596	0.80
10	Powerline Road	31688305	WB	1,000	2	2,000	1,203	0.60	1,110	0.56
11	New East/West Road	32104387	EB	600	1	600	241	0.40	252	0.42
12	New East/West Road	32104387	WB	600	1	600	93	0.16	261	0.44
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	8	Direction
Name	West Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
6	4,300	1,967	0.46	2,838	0.66
6	4,300	2,359	0.55	3,024	0.70

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Morton Avenue	31691008	EB	500	1	500	72	0.14	96	0.19
2	Morton Avenue	31691008	WB	500	1	500	112	0.22	153	0.31
3	Charing Cross Street	31689369	EB	800	2	1,600	579	0.36	886	0.55
4	Charing Cross Street	31689369	WB	800	2	1,600	655	0.41	1,030	0.64
5	Dundas Street	31679012	EB	600	1	600	254	0.42	316	0.53
6	Dundas Street	31679012	WB	600	1	600	170	0.28	235	0.39
7	Brant Avenue	31670814	EB	800	2	1,600	1,062	0.66	1,540	0.96
8	Brant Avenue	31670814	WB	800	2	1,600	1,422	0.89	1,606	1.00
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	9	Direction
Name	CNR Corridor	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
11	7,900	4,122	0.52	5,038	0.64
11	7,900	4,062	0.51	5,843	0.74

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	St. Paul Avenue	32103535	NB	800	2	1,600	739	0.46	995	0.62
2	St. Paul Avenue	32103535	SB	800	2	1,600	849	0.53	1,084	0.68
3	West Street	31678374	NB	800	1	800	580	0.73	705	0.88
4	West Street	31678374	SB	800	1	800	751	0.94	849	1.06
5	Clarence Street	31678962	NB	800	2	1,600	1,216	0.76	1,305	0.82
6	Clarence Street	31678962	SB	800	2	1,600	1,050	0.66	1,479	0.92
7	Murray Street	31681384	NB	500	1	500	87	0.17	169	0.34
8	Murray Street	31681384	SB	500	1	500	88	0.18	325	0.65
9	Rawdon Street	31698868	NB	500	1	500	283	0.57	240	0.48
10	Rawdon Street	31698868	SB	500	1	500	161	0.32	343	0.69
11	Stanley Street	31698979	NB	500	1	500	395	0.79	394	0.79
12	Stanley Street	31698979	SB	500	1	500	302	0.60	433	0.87
13	Wayne Gretzky Parkway	31700977	NB	900	2	1,800	649	0.36	1,004	0.56
14	Wayne Gretzky Parkway	31700971	SB	900	2	1,800	685	0.38	1,131	0.63
15	Garden Avenue	32079892	NB	600	1	600	173	0.29	226	0.38
16	Garden Avenue	32079892	SB	600	1	600	176	0.29	199	0.33
17										
18										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	10	Direction
Name	Garden Avenue	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
8	8,000	4,705	0.59	5,716	0.71
8	8,000	4,568	0.57	6,082	0.76

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Lynden Road	31708958	EB	800	2	1,600	685	0.43	963	0.60
2	Lynden Road	31708958	WB	800	2	1,600	709	0.44	1,189	0.74
3	Highway 403	32104066	EB	1,800	2	3,600	2,913	0.81	3,388	0.94
4	Highway 403	32104065	WB	1,800	2	3,600	2,987	0.83	3,309	0.92
5	Henry Street	32081112	EB	800	1	800	342	0.43	539	0.67
6	Henry Street	32081112	WB	800	1	800	369	0.46	510	0.64
7	Elgin Street	32079965	EB	600	1	600	99	0.17	136	0.23
8	Elgin Street	32079965	WB	600	1	600	98	0.16	135	0.23
9	Grey Street	32079358	EB	600	1	600	100	0.17	71	0.12
10	Grey Street	32079358	WB	600	1	600	61	0.10	164	0.27
11	Colborne Street	32102783	EB	800	1	800	566	0.71	619	0.77
12	Colborne Street	32102783	WB	800	1	800	344	0.43	775	0.97
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	11	Direction
Name	Powerline Road	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
14	11,500	4,634	0.40	6,317	0.55
14	11,500	4,831	0.42	6,609	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Oak Park Road	32103349	NB	1,000	2	2,000	791	0.40	1,097	0.55
2	Oak Park Road	32103349	SB	1,000	2	2,000	745	0.37	1,059	0.53
3	Paris Road	32104353	NB	800	2	1,600	222	0.14	235	0.15
4	Paris Road	32104353	SB	800	2	1,600	226	0.14	240	0.15
5	Golf Road	32103116	NB	1,000	1	1,000	855	0.86	682	0.68
6	Golf Road	32103116	SB	1,000	1	1,000	296	0.30	939	0.94
7	Balmoral Drive	32104424	NB	600	1	600	409	0.68	253	0.42
8	Balmoral Drive	32104424	SB	600	1	600	151	0.25	423	0.71
9	King George Road	32101870	NB	800	2	1,600	790	0.49	1,126	0.70
10	King George Road	32101870	SB	800	2	1,600	1,097	0.69	1,166	0.73
11	Memorial Drive	31688335	NB	800	1	800	142	0.18	353	0.44
12	Memorial Drive	31688335	SB	800	1	800	254	0.32	401	0.50
13	Greenfield Road	31709585	NB	500	1	500	42	0.08	47	0.09
14	Greenfield Road	31709585	SB	500	1	500	34	0.07	45	0.09
15	Wayne Gretzky Parkway	31696170	NB	1,000	2	2,000	713	0.36	1,612	0.81
16	Wayne Gretzky Parkway	32101994	SB	1,000	2	2,000	1,306	0.65	1,421	0.71
17	Brantwood Park Road	32103099	NB	600	1	600	220	0.37	287	0.48
18	Brantwood Park Road	32103099	SB	600	1	600	175	0.29	284	0.47
19	Park Road North	32101996	NB	800	1	800	450	0.56	625	0.78
20	Park Road North	32101996	SB	800	1	800	547	0.68	631	0.79

Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	12	Direction
Name	Murray Street	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	4,400	2,148	0.49	1,750	0.40
8	5,200	1,633	0.31	2,707	0.52

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Henry Street	32102230	EB	800	1	800	348	0.44	306	0.38
2	Henry Street	32102230	WB	800	1	800	458	0.57	588	0.74
3	Elgin Street	32102140	EB	500	1	500	141	0.28	73	0.15
4	Elgin Street	32102140	WB	500	1	500	127	0.25	155	0.31
5	Grey Street	31680485	EB	500	1	500	90	0.18	131	0.26
6	Grey Street	31680485	WB	500	1	500	70	0.14	119	0.24
7	Colborne Street	31680092	EB	800	2	1,600	922	0.58	897	0.56
8	Dalhousie Street	31680105	WB	800	3	2,400	714	0.30	1,020	0.43
9	Mary Street	31677408	EB	500	1	500	203	0.41	42	0.08
10	Mary Street	31677408	WB	500	1	500	15	0.03	199	0.40
11	Greenwich Street	31677317	EB	500	1	500	444	0.89	301	0.60
12	Greenwich Street	31677317	WB	500	1	500	249	0.50	626	1.25
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14										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	13	Direction
Name	West External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
7	7,300	1,672	0.23	2,301	0.32
7	7,300	1,660	0.23	2,153	0.29

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Silver Street (Brant Road 52)	31635739	EB	800	1	800	223	0.28	257	0.32
2	Silver Street (Brant Road 52)	31635739	WB	800	1	800	165	0.21	166	0.21
3	Brant Road 2	31627987	EB	800	1	800	236	0.30	274	0.34
4	Brant Road 2	31627987	WB	800	1	800	183	0.23	578	0.72
5	Powerline Road	32103319	EB	500	1	500	53	0.11	60	0.12
6	Powerline Road	32103319	WB	500	1	500	53	0.11	65	0.13
7	Highway 403	32103921	EB	1,800	2	3,600	831	0.23	1,317	0.37
8	Highway 403	32103924	WB	1,800	2	3,600	1,021	0.28	1,094	0.30
9	Bethel Road	31626662	EB	500	1	500	0	0.00	3	0.01
10	Bethel Road	31626662	WB	500	1	500	0	0.00	0	0.00
11	Colborne Street (Brant Road 53)	32103323	EB	1,100	1	1,100	329	0.30	390	0.35
12	Colborne Street (Brant Road 53)	32103323	WB	1,100	1	1,100	238	0.22	250	0.23
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	14	Direction
Name	South-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
4	4,300	1,581	0.37	1,178	0.27
4	4,300	942	0.22	1,732	0.40

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Rest Acres Road (Highway 24)	31623575	NB	1,200	1	1,200	458	0.38	283	0.24
2	Rest Acres Road (Highway 24)	31623575	SB	1,200	1	1,200	375	0.31	562	0.47
3	Mount Pleasant Road (Brant Road 24)	31641599	NB	1,000	1	1,000	213	0.21	224	0.22
4	Mount Pleasant Road (Brant Road 24)	31641599	SB	1,000	1	1,000	180	0.18	232	0.23
5	Pleasant Ridge Road (Brant Road 7)	31641036	NB	1,000	1	1,000	210	0.21	112	0.11
6	Pleasant Ridge Road (Brant Road 7)	31641036	SB	1,000	1	1,000	75	0.08	224	0.22
7	Cockshutt Road (Brant Road 4)	32103199	NB	1,100	1	1,100	700	0.64	559	0.51
8	Cockshutt Road (Brant Road 4)	32103199	SB	1,100	1	1,100	312	0.28	714	0.65
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	15	Direction
Name	East External	
Direction	EB-WB	EB
		WB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
5	6,900	3,160	0.46	3,825	0.55
5	6,900	3,302	0.48	3,962	0.57

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Highway 403	32104077	EB	1,800	2	3,600	2,497	0.69	3,050	0.85
2	Highway 403	32104074	WB	1,800	2	3,600	2,767	0.77	2,961	0.82
3	Brant Road 2	32087178	EB	1,100	2	2,200	405	0.18	389	0.18
4	Brant Road 2	32087178	WB	1,100	2	2,200	236	0.11	622	0.28
5	Brant Road 54	32079101	EB	1,100	1	1,100	258	0.23	386	0.35
6	Brant Road 54	32079101	WB	1,100	1	1,100	299	0.27	379	0.34
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	16	Direction
Name	North-East External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,200	1,430	0.45	1,713	0.54
3	3,200	1,243	0.39	2,329	0.73

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	East River Road	31664248	NB	1,000	1	1,000	296	0.30	209	0.21
2	East River Road	31664248	SB	1,000	1	1,000	120	0.12	513	0.51
3	Highway 24	32104116	NB	1,200	1	1,200	793	0.66	996	0.83
4	Highway 24	32104116	SB	1,200	1	1,200	632	0.53	1,136	0.95
5	St. George Road	31864585	NB	1,000	1	1,000	341	0.34	508	0.51
6	St. George Road	31864585	SB	1,000	1	1,000	491	0.49	680	0.68
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Legned:

		V/C Range	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

SCREENLINE DETAILS

2051

Screenline	17	Direction
Name	North-West External	
Direction	NB-SB	NB
		SB

Capacity		AM Peak Hour		PM Peak Hour	
Lanes	Total	Volume	V/C	Volume	V/C
3	3,300	755	0.23	919	0.28
3	3,300	794	0.24	953	0.29

#	Name	Link	Direction	Capacity			AM Peak Hour		PM Peak Hour	
				Per	Lanes	Total	Volume	V/C	Volume	V/C
1	Brant-Oxford Road	31625759	NB	1,100	1	1,100	258	0.23	222	0.20
2	Brant-Oxford Road	31625759	SB	1,100	1	1,100	274	0.25	285	0.26
3	Ayr Road	31626456	NB	1,100	1	1,100	1	0.00	5	0.00
4	Ayr Road	31626456	SB	1,100	1	1,100	1	0.00	12	0.01
5	Pinehurst Road	32103147	NB	1,100	1	1,100	496	0.45	692	0.63
6	Pinehurst Road	32103147	SB	1,100	1	1,100	519	0.47	656	0.60
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9										
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Legned:		*V/C Range*	*From*	*To*
X	Good Capacity Conditions		0.00	0.70
X	Approaching Capacity Conditions		0.70	0.85
X	Over Capacity Conditions		0.85	-

APPENDIX D

Costs -

Updated

City of Brantford: 2020 Transportation Master Plan Update - 2051 Addendum - Active Transportation Capital Cost Estimates

#	Proposed Project	Facility Type	Length of ROW (km)	Sub-Total Cost	Contingency**	TOTAL Cost
SHORT-TERM 2021 – 2025						
1	Colborne Street – Wayne Gretzky Parkway to Garden Avenue	Road Diet	2.1	$ 132,300	$ 19,845	$ 152,145
2	Colborne Street – Dalhousie Street to Wayne Gretzky Parkway	Bike Lanes	0.7	$ 490,000	$ 73,500	$ 563,500
3	Colborne Street – Clarence Street to Dalhousie Street	Bike Lanes	1.3	$ 39,000	$ 5,850	$ 44,850
3	Dalhousie Street – Colborne Street to Clarence Street	Bike Lanes	1.3	$ 39,000	$ 5,850	$ 44,850
4	Clarence Street - Rail Corridor to Colborne Street	MUP	0.5	$ 162,500	$ 24,375	$ 186,875
5	Fairview Road – King George Road to West Street	Road Diet	2.3	$ 144,900	$ 21,735	$ 166,635
6	Tollgate Road – Paris Road to King George Road	Road Diet	1.5	$ 94,500	$ 14,175	$ 108,675
7	Oak Park Road – Powerline Road to Hardy Road*	Bike Lanes	1.3			
8	Hardy Road – St. Andrews Drive to Paris Road	Bike Lanes	0.3	$ 210,000	$ 31,500	$ 241,500
9	Veterans Memorial Parkway – Mount Pleasant Street to Erie Avenue*	MUP	1.2			
10	Dalhousie Street to Brant's Crossing	MUP	0.2	$ 70,000	$ 10,500	$ 80,500
11	Colborne Street West – CR7 to D'Aubigny Road*	MUP	1.2			
12	Colborne Street West –D'Aubigny Road to D'Aubigny Trail (Oakhill Dr / Spalding Dr)	MUP	0.7	$ 227,500	$ 34,125	$ 261,625
13	Wayne Gretzky Parkway Extension – Powerline Road to Park Road*	MUP	0.9			
14	Balmoral Drive – Powerline Road to Oxford Street	Bike Lanes	2.2	$ 66,000	$ 9,900	$ 75,900
15	Oxford Street – Balmoral Drive to King George Road	Bike Lanes	0.5	$ 15,000	$ 2,250	$ 17,250
16	Dunsdon Street - King George Road to Park Road	Road Diet	3.1	$ 195,300	$ 29,295	$ 224,595
17	Dundas Street / Elgin Street - North Park to Wayne Gretzky Parkway	Bike Priority Street	3.0	$ 330,000	$ 49,500	$ 379,500
18	1/4 of total Bike Route / Shared Use Lane projects around the City	Bike Route / Shared Use Lane	7.6	$ 9,120	$ 1,368	$ 10,488
19	Programs (Studies, Events, Initiatives)	N/A	N/A	$ 820,000	$ -	$ 820,000
MEDIUM-TERM 2026 – 2031						
20	Oak Park Road Extension – Hardy Road to Colborne Street*	MUP	4.3			
21	Paris Road - Oak Park Road to Golf Road*	Bike Lanes/Paved Shoulder	2.8			
22	Paris Road - Golf Road to Hardy Road	Bike Lanes/Paved Shoulder	1.6	$ 504,000	$ 75,600	$ 579,600
23	Powerline Road – Oak Park Road to King George Road*	MUP & Bike Lanes	3.7			
24	Charing Cross Extension – West Street to Henry Street*	Bike Lanes	0.7			
25	Henry Street – Charing Cross Extension to WGP	Bike Lanes	0.8	$ 560,000	$ 84,000	$ 644,000
26	Charing Cross – King George Road to West Street	Bike Lanes	1.5	$ 1,050,000	$ 157,500	$ 1,207,500
27	Golf Road - Paris Road to Proposed mid-term Development Limit*	Bike Lanes/Paved Shoulder	1.9			
28	Lynden Road – West Street to Garden Avenue	Buffered Bike Lanes	2.4	$ 1,968,000	$ 295,200	$ 2,263,200
29	Garden Avenue – Lynden Road to Henry Street	Buffered Bike Lanes	2.1	$ 1,722,000	$ 258,300	$ 1,980,300
30	Henry Street – Garden Avenue to Garden Avenue	Bike Lanes	0.2	$ 140,000	$ 21,000	$ 161,000
31	Garden Avenue – Henry Street to Elgin Street	Bike Lanes	0.8	$ 120,000	$ 18,000	$ 138,000
32	Brantwood Park Road - Dunsdon Street to Lynden Road	Bike Lanes	1.6	$ 100,800	$ 15,120	$ 115,920
33	Market Street to Mohawk Street	MUP	1.0	$ 350,000	$ 52,500	$ 402,500
34	Shallow Creek Trail - Lynnwood Drive	MUP	1.1	$ 385,000	$ 57,750	$ 442,750
35	Willian Street – Bedford Street to West Street	Road Diet	1.2	$ 25,800	$ 3,870	$ 29,670
36	Albion Street – Bedford Street to West Street	Road Diet	1.1	$ 23,650	$ 3,548	$ 27,198
37	Memorial / Baxter / Farringford / Edmondson – North Park Street to Wayne Gretzky Parkway Trail	Bike Priority Street	1.7	$ 187,000	$ 28,050	$ 215,050
38	Queensway Drive - St. George Street to King George Road	Bike Priority Street	0.6	$ 66,000	$ 9,900	$ 75,900
39	McMurry / Wells / North Park - Albion Street to St George Street	Bike Priority Street	0.8	$ 88,000	$ 13,200	$ 101,200
40	1/4 of total Bike Route / Shared Use Lane projects around the City	Bike Route / Shared Use Lane	7.6	$ 9,120	$ 1,368	$ 10,488
41	Programs (Studies, Events, Initiatives)	N/A	N/A	$ 690,000	$ -	$ 690,000

#	Proposed Project	Facility Type	Length of ROW (km)	Sub-Total Cost	Contingency**	TOTAL Cost
LONG-TERM 2032 – 2051						
42	Powerline Road – King George Road to East City Boundary*	MUP & Bike Lanes	4.0			
43	Brantwood Park Road – Powerline Road to Banbury Road	Bike Lanes	0.7	$ 44,100	$ 6,615	$ 50,715
44	Conklin Road Extension – Mt. Pleasant Road to Phelps Road*	Bike Lanes	2.8			
45	Conklin Road – L.E. & N Trail to Mt. Pleasant	Bike Lanes	0.2	$ 140,000	$ 21,000	$ 161,000
46	Elgin Street – Wayne Gretzky Parkway to Garden Avenue	Bike Lanes	2.3	$ 1,610,000	$ 241,500	$ 1,851,500
47	Roy Boulevard – Lynden Park Mall to Lynden Road	Bike Lanes	1.5	$ 1,050,000	$ 157,500	$ 1,207,500
48	Diana Avenue	Bike Lanes	0.7	$ 21,000	$ 3,150	$ 24,150
49	Erie Avenue – Birkett Lane to City Boundary	Bike Lanes/Paved Shoulder	0.8	$ 120,000	$ 18,000	$ 138,000
50	Mohawk Street – Proposed trail (Cayuga St / Greenwich St) to Hamilton Brantford Rail Trail	Bike Lanes/Paved Shoulder	1.9	$ 693,500	$ 104,025	$ 797,525
51	Paris Road – Hardy Road to Henderson Avenue	MUP	1.1	$ 357,500	$ 53,625	$ 411,125
52	Colborne Street to Grey Street	MUP	0.5	$ 175,000	$ 26,250	$ 201,250
53	Dante Crescent to Ludlow Crescent	MUP	0.2	$ 70,000	$ 10,500	$ 80,500
54	Blackfriers Lane to Dunsdon Street	MUP	0.8	$ 280,000	$ 42,000	$ 322,000
55	Colborne Street to Bruce Street	MUP	1.1	$ 357,500	$ 53,625	$ 411,125
56	SC Johnson Trail (Dufferin Ave) - SC Johnson Trail (Yorkshire St)	MUP	1.7	$ 552,500	$ 82,875	$ 635,375
57	New East/West Road – Paris Road to King George Road*	Buffered Bike Lanes	4.2			
58	New East/West Road – King George Road to East City Boundary*	Buffered Bike Lanes	4.5			
59	North Brantford Expansion – Golf Road to Wayne Gretzky Parkway	MUP	5.7	$ 1,995,000	$ 299,250	$ 2,294,250
60	North Brantford Expansion Collector Roads	Bike Lanes	7.0	$ 4,900,000	$ 735,000	$ 5,635,000
61	Tutela Heights Expansion – L.E. & N Trail to New Collector Road	MUP	0.3	$ 105,000	$ 15,750	$ 120,750
62	Tutela Heights Expansion Collector Roads	Bike Lanes	1.4	$ 980,000	$ 147,000	$ 1,127,000
63	Davern Road – Tutela Heights Road to Conklin Road Extension	Bike Lanes	0.8	$ 656,000	$ 98,400	$ 754,400
64	Lynden/Garden Expansion Collector Roads	Bike Lanes	1.1	$ 770,000	$ 115,500	$ 885,500
65	Lynden Road – Garden Avenue to East City Boundary	Bike Lanes	1.5	$ 225,000	$ 33,750	$ 258,750
66	Rawdon Street - Darling Street to Able Avenue	Bike Priority Street	1.2	$ 132,000	$ 19,800	$ 151,800
67	Wellington Street - West Street to Park Road North	Bike Priority Street	2.7	$ 297,000	$ 44,550	$ 341,550
68	1/2 of total Bike Route / Shared Use Lane projects around the City	Bike Route / Shared Use Lane	15.2	$ 18,240	$ 2,736	$ 20,976
69	Programs (Studies, Events, Initiatives)	N/A	N/A	$ 1,375,000	$ -	$ 1,375,000
			145.0	$ 27,958,830	$ 3,761,075	$ 31,719,905

Notes: All costs stated in 2020 dollars

* Costs captured as part of a roadway infrastructure project

** Contingency of 30% for Engineering assumed

City of Brantford: 2020 Transportation Master Plan Update - 2051 Addendum - Transit Infrastructure Capital Cost Estimates

Conventional

	2016	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pop 2016 forecast	100,431	110,700	113,300	115,860	118,431	121,002	123,573	126,144					
Pop 2020 forecast	101,700	106,500	111,300	114,080	116,860	119,640	122,420	125,200	127,960	130,720	133,480	136,240	139,000
Bus Fleet	31	31	31	31	31	31	31	32	33	33	35	35	35
Revenue Hrs - Base		91,703	91,703	93,597	99,696	107,257	115,349	123,504	132,403	136,774	141,193	144,832	149,824
Revenue Hrs - Increase			1,894	6,099	7,561	8,092	8,155	8,899	4,371	4,419	3,639	4,992	5,164
Revenue Hrs - Total		91,703	93,597	99,696	107,257	115,349	123,504	132,403	136,774	141,193	144,832	149,824	154,988
Bus Expansion							$ 1,100,000	$ 1,100,000		$ 1,100,000			
Bus Replacement			$ 2,200,000	$ 3,300,000	$ 3,300,000	$ 3,300,000	$ 2,200,000	$ 1,100,000	$ 1,100,000	$ 2,200,000	$ 2,200,000	$ 2,200,000	$ 2,200,000
Terminal (1 locations)													
Lynden Mall					$ 250,000								
Brantford Commons					$ 250,000								
Bus Stop/Signage													
Additional Shelters								$ 100,000					
Transit Center								$ 1,100,000					
ITS					$ 121,000	$ 170,000	$ 270,000	$ 373,000	$ 178,000				
Studies (i.e.. Transit TMP)			$ 375,000						$ 100,000				
							$ 16,836,000						$ 15,051,000

Specialized

	2016	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
In Service Vehicles			14	14	14	14	14	14	14	14	14	14	14
# Vehicles Replaced			2	3	3	2	4	3	2	3	2	3	2
Vehicle Expansion													
Revenue Hours													
Vehicle Replacement			$ 220,000	$ 330,000	$ 330,000	$ 220,000	$ 440,000	$ 750,000	$ 500,000	$ 750,000	$ 500,000	$ 750,000	$ 500,000
New Vehicles			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Telecom Software			$ 30,000										
							$ 1,570,000						$ 3,750,000
							SUB TOTAL Conventional + Specialized $ 18,406,000						SUB TOTAL Conventional + Specialized $ 18,801,000

Note: 2021 -2031 based on 2016 Transit Service Plan 2017-2026, with update to cost assumptions as discussed Aug 28/20
2032-2051 based on service expansion and enhancement to Expansion Lands

Conventional

	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Pop 2016 forecast											
Pop 2020 forecast	141,600	144,200	146,800	149,400	152,000	154,200	156,400	158,600	160,800	163,000	
Bus Fleet	36	36	38	38	39	39	39	39	40	40	
Revenue Hrs - Base	154,988	159,113	159,113	170,183	170,183	175,853	175,853	175,853	175,853	181,253	
Revenue Hrs - Increase	4,125	-	11,070	-	5,670	-	-	-	5,400	-	
Revenue Hrs - Total	159,113	159,113	170,183	170,183	175,853	175,853	175,853	175,853	181,253	181,253	
Bus Expansion	$ 1,100,000		$ 2,200,000		$ 1,100,000				$ 1,100,000		
Bus Replacement	$ 2,200,000	$ 2,200,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	
Terminal (1 locations)	$ 3,750,000	$ 3,750,000									
Lynden Mall											
Brantford Commons											
Bus Stop/Signage	$ 120,000		$ 540,000		$ 150,000				$ 270,000		
Additional Shelters	$ 60,000		$ 270,000		$ 75,000				$ 135,000		
Transit Center											
ITS											
Studies (i.e.. Transit TMP)											
											$27,820,000

Specialized

	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
In Service Vehicles	15	15	16	16	17	17	17	17	17	17	
# Vehicles Replaced	2	2	2	2	2	2	2	2	2	2	
Vehicle Expansion	1		1		1						
Revenue Hours											
Vehicle Replacement	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	
New Vehicles	$ 250,000	$ -	$ 250,000	$ -	$ 250,000	$ -	$ -	$ -	$ -	$ -	
Telecom Software	$ 50,000										
											$ 5,800,000
										SUB TOTAL Conventional + Specialized	$33,620,000

Note: 2021 -2031 based on 2016 Transit Service Plan 2017-2026, with update to cost assumptions as discussed Aug 28/20
2032-2051 based on service expansion and enhancement to Expansion Lands

Conventional

	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	Short Term	Mid-Term	Long-Term	Longer-Term
Pop 2016 forecast														
Pop 2020 forecast	165,600	168,200	170,800	173,400	164,000	166,200	168,400	170,600	172,800	165,000				
Bus Fleet	41	41	43	43	44	44	44	44	45	45				
Revenue Hrs - Base	181,253	185,378	185,378	196,448	196,448	202,118	202,118	202,118	202,118	207,518				
Revenue Hrs - Increase	4,125	-	11,070	-	5,670	-	-	-	5,400	-				
Revenue Hrs - Total	185,378	185,378	196,448	196,448	202,118	202,118	202,118	202,118	207,518	207,518				
Bus Expansion	$ 1,100,000		$ 2,200,000		$ 1,100,000				$ 1,100,000		$ 1,100,000	$ 2,200,000	$ 5,500,000	$ 5,500,000
Bus Replacement	$ 2,200,000	$ 2,200,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 14,300,000	$ 11,000,000	$ 13,200,000	$ 13,200,000
Terminal (1 locations)											$ -	$ -	$ 7,500,000	$ -
Lynden Mall											$ 250,000	$ -	$ -	$ -
Brantford Commons											$ 250,000	$ -	$ -	$ -
Bus Stop/Signage	$ 120,000	$ -	$ 540,000	$ -	$ 150,000	$ -	$ -	$ -	$ 270,000	$ -	$ -	$ -	$ 1,080,000	$ 1,080,000
Additional Shelters	$ 60,000	$ -	$ 270,000	$ -	$ 75,000	$ -	$ -	$ -	$ 135,000	$ -	$ -	$ 100,000	$ 540,000	$ 540,000
Transit Center											$ -	$ 1,100,000	$ -	$ -
ITS											$ 561,000	$ 551,000	$ -	$ -
Studies (i.e.. Transit TMP)	$ 100,000										$ 375,000	$ 100,000	$ -	$ 100,000
										$ 20,420,000	$ 16,836,000	$ 15,051,000	$ 27,820,000	$ 20,420,000

Specialized

	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	Short Term	Mid-Term	Long-Term	Longer-Term
In Service Vehicles	18	18	19	19	20	20	20	20	20	20				
# Vehicles Replaced	2	2	2	2	2	2	2	2	2	2				
Vehicle Expansion	1		1		1									
Revenue Hours														
Vehicle Replacement	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 1,540,000	$ 3,750,000	$ 5,000,000	$ 5,000,000
New Vehicles	$ 250,000	$ -	$ 250,000	$ -	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000	$ 750,000
Telecom Software	$ 50,000										$ 30,000	$ -	$ 50,000	$ 50,000
										$ 5,800,000	$ 1,570,000	$ 3,750,000	$ 5,800,000	$ 5,800,000
SUB TOTAL Conventional + Specialized										$ 26,220,000	$ 18,406,000	$ 18,801,000	$ 33,620,000	$ 26,220,000
TOTAL Conventional + Specialized														$ 97,047,000

Note: 2021 -2031 based on 2016 Transit Service Plan 2017-2026, with update to cost assumptions as discussed Aug 28/20
2032-2051 based on service expansion and enhancement to Expansion Lands

City of Brantford: 2020 Transportation Master Plan Update - 2051 Addendum - Road Infrastructure Capital Cost Estimates

#	Proposed Project	Length of ROW (km)	ROW Lane Costs						Structure / Equipment Costs	Sub-Total Cost	Contingency***		TOTAL Cost
			Roads	Sidewalks	MUP	Bike lane	Paved shoulder	Total Roadway			Construction	Engineering	
SHORT-TERM 2021 – 2025													
1	Veterans Memorial Parkway Widening (4 lanes – Mount Pleasant Street to Erie Avenue)*	1.19						$ 11,477,705	$ 18,454,800	$ 29,932,505	$ 5,986,501	$ 4,489,876	$ 40,408,881
2	Oak Park Road Widening (4 lanes – Powerline Road to Hwy 403 & Fen Ridge Court/Savannah Oaks Drive to Hardy Road)	1.33	$ 3,072,300	$ 957,600	$ -	$ -	$ 232,750			$ 4,262,650	$ 852,530	$ 1,278,795	$ 6,393,975
3	Colborne Street West widening (4 lanes – CR7 to D'Aubigny Road)	1.15	$ 1,328,250	$ 414,000	$ 373,750	$ -	$ 201,250			$ 2,317,250	$ 463,450	$ 695,175	$ 3,475,875
4	Wayne Gretzky Parkway Extension (4 lanes - Powerline Road to Park Road North)	0.85	$ 1,963,500	$ 306,000	$ 276,250	$ -	$ 148,750			$ 2,694,500	$ 538,900	$ 808,350	$ 4,041,750
MEDIUM-TERM 2026 – 2031													
5	Oak Park Road Extension (4 Lanes – Hardy Road to Colborne Street)**	4.3						$ 29,330,385	$ 35,497,728	$ 64,828,113	$ 19,765,590	$ 14,234,246	$ 98,827,949
6	Paris Road widening (4 lanes – Oak Park Road to Golf Road)	2.81	$ 6,491,100	$ -	$ -	$ -	$ 688,450			$ 7,179,550	$ 1,435,910	$ 2,153,865	$ 10,769,325
7A	Powerline Road widening (4 lanes – Oak Park Road to King George Road)	3.74	$ 8,639,400	$ 1,346,400	$ 1,215,500	$ 2,042,040	$ -			$ 13,243,340	$ 2,648,668	$ 3,973,002	$ 19,865,010
8	Charing Cross Extension (4 Lanes – West Street to Henry Street)	0.74	$ 1,709,400	$ 532,800	$ -	$ 404,040	$ -		$ 10,000,000	$ 12,646,240	$ 2,529,248	$ 3,793,872	$ 18,969,360
9	Golf Road TSM (Paris Road to Proposed Development Limit)	1.9	$ -	$ 1,368,000	$ -	$ -	$ 1,316,700		$ 825,000	$ 3,509,700	$ 701,940	$ 1,052,910	$ 5,264,550
10	Mohawk Street / Greenwich Street / Murray Street intersection realignment & improvements	0.5	$ 1,155,000	$ 360,000	$ -	$ -	$ -		$ 850,000	$ 2,365,000	$ 473,000	$ 709,500	$ 3,547,500
LONG-TERM 2032 – 2051													
11	Wayne Gretzky Parkway widening (6 Lane – Lynden Road to Henry Street)	2.02	$ 6,999,300	$ -	$ -	$ -	$ 353,500		$ 12,000,000	$ 19,352,800	$ 3,870,560	$ 5,805,840	$ 29,029,200
7B	Powerline Road widening (4 lanes – King George Road to East City Boundary)	3.95	$ 9,124,500	$ 1,422,000	$ 1,283,750	$ 2,156,700	$ -			$ 13,986,950	$ 2,797,390	$ 4,196,085	$ 20,980,425
12	Conklin Road Extension (2 lanes - Mt. Pleasant Road to Phelps Road)	2.8	$ 3,234,000	$ 2,016,000	$ -	$ 1,528,800	$ -			$ 6,778,800	$ 1,355,760	$ 2,033,640	$ 10,168,200
13A	New East/West Road (2 lanes – Oak Park Road to King George Road)	4.2	$ 4,851,000	$ 3,024,000	$ -	$ 2,293,200	$ -			$ 10,168,200	$ 2,033,640	$ 3,050,460	$ 15,252,300
13B	New East/West Road (2 lanes – King George Road to East City Boundary)	4.5	$ 5,197,500	$ 3,240,000	$ -	$ 2,457,000	$ -			$ 10,894,500	$ 2,178,900	$ 3,268,350	$ 16,341,750
14	Clarence Street TSM (Icomm Drive to West Street)	1.5	$ 1,237,500	$ 1,080,000	$ -	$ -	$ -		$ 1,900,000	$ 4,217,500	$ 843,500	$ 1,265,250	$ 6,326,250
15	Highway 403 / Oak Park Road Interchange upgrade (to ultimate configuration)		$ -	$ -	$ -	$ -	$ -		$ 12,000,000	$ 12,000,000	$ 2,400,000	$ 3,600,000	$ 18,000,000
										$ 220,377,598	$ 50,875,487	$ 56,409,216	$ 327,662,300

Notes: All costs stated in 2020 dollars unless identified otherwise in reference reports (i.e. feasibility reports)

* Reference Costs Source: Veterans Memorial Parkway Widening and Extension, CIMA+, October 2018 - [Assume: Mt Pleasant to Bridge = 950 m (from feasibility study) and Bridge to existing 4-lane cross section west of Erie = 240 m]

** Reference Costs Source Oak Park Road Extension Feasibility Study , Parsons, July 2019

*** Contingency of 20% for Construction and 30% for Engineering assumed unless stated specifically in reference reports (i.e. feasibility reports).