County of Brant

TRANSPORTATION MASTER PLAN



FINAL REPORT

December, 2008

IBI GROUP

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1. INTRODUCTION

1.1 Purpose of the Transportation Master Plan

The County of Brant Transportation Master Plan (CBTMP) identifies existing and future levels of travel demand throughout the County to determine the transportation infrastructure required to ensure the safe and efficient movement of people, goods and services and to encourage economic growth and prosperity. The CBTMP, prepared in conjunction with and in accordance with the new County of Brant Official Plan, also contains new policies and guidelines required by the County to plan for and administer specific components of the County transportation system under County jurisdiction, including roads, commercial goods movement, traffic control and management, trail planning, transportation-oriented development and potential transit service. Key strategic recommendations of the CBTMP are to be implemented by the County Official Plan through amendment, as described in Section 7.2 of this document.

1.2 Background

The County of Brant is a single tier municipality with a population of approximately 30,000 people. Over the past decade the County has experienced a moderate level of growth and economic prosperity due to a favourable political and economic environment throughout the province. Its location in southwestern Ontario and its relative location to the Highway 401 and Highway 403 trade corridors provides the county excellent access to major markets including the Greater Toronto area, the Niagara Region, Western New York and Michigan. As a result of growth in residential, commercial, and industrial sectors, the County is experiencing localized transportation pressures resulting in some operating issues/deficiencies. These issues/deficiencies are expected to worsen over the next 20 years.

1.3 Master Plan Scope

It is extremely important to clearly state the scope of a transportation master plan. According to the Municipal Class Environmental Assessment Process (2007), a master plan is defined as:

"A long range plan which integrates infrastructure requirements for existing and future land use with environmental assessment principles."
"The scope of a Master Plan is broad and usually includes an analysis of the system in order to outline a framework for future works and developments. ***Master Plans are not typically undertaken to address a site-specific problem."***

Following on these Environmental Assessment definitions, a transportation master plan examines the overall transportation system, not site or area-specific components of that system such as specific roads or intersections. Where roads and intersections are considered, they are reviewed in the context of the larger area road network in which they function. Other descriptors of a transportation master plan that have established the scope of this project are:

- *Comprehensive, strategic-level planning;*
- *Provides direction for municipal transportation investment and priorities;*
- *Multi-modal scope considering all modes of transportation under municipal jurisdiction including roads, transit, cycling and walking;*

- *Long range, planning 20-25 years into the future, usually in increments of the short term (0-5 years), medium term (5-10 years) and long term (10-20 years). In some cases the longer 25 year-plus planning horizon is included for transportation corridor protection;*
- *The master plan sets policy direction for the municipality's Official Plan;*
- *A master plan is a package of actions, with no single solution to meet existing and future needs;*
- *Master plans should be dynamic documents that are flexible to changing conditions over time;*
- *In Ontario, master plans should be prepared to satisfy Phase 1 and 2 of the Municipal Class Environmental Assessment process dealing with Need or Opportunity, and Alternative Planning Solutions; and*
- *The master plan is custom-made for the municipality it covers, while often also referring to best practice experience from comparable municipalities.*

On this subject of best practices, the focus of most transportation master planning in Canada is on urban areas. However, primarily rural municipalities with urban settlements such as the County of Brant still benefit from transportation master planning. For example, in southern Ontario transportation master plans are in effect in rural municipalities such as the County of Oxford (Draft), County of Peterborough and County of Essex. Also, although the generic vision for urban transportation in Canada prepared by the Transportation Association of Canada in 2003 is oriented towards large and medium-sized urban municipalities, it includes principles that are applicable and useful in planning the future of rural and small settlement transportation systems as found in the County of Brant, namely:[1]

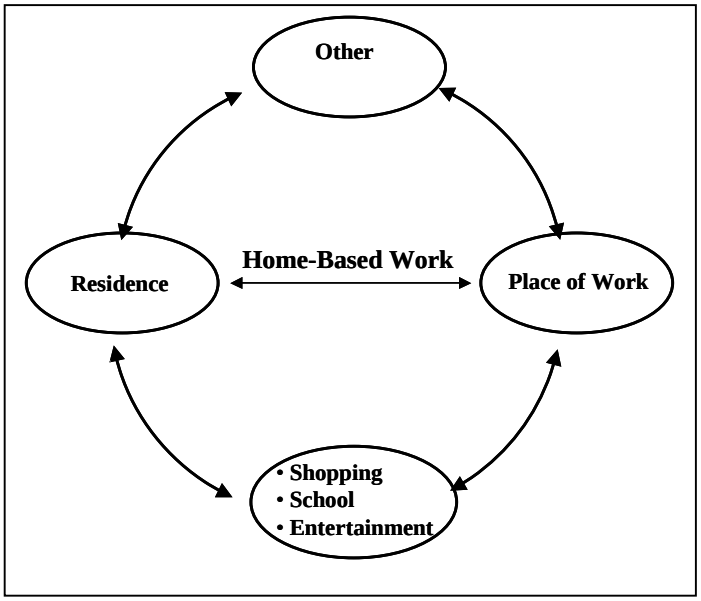
- Plan for increased densities and more mixed land use;
- Promote walking as the preferred mode for person trips (where practical in the County);
- Increase opportunities for cycling as an optional mode of travel;
- Provide higher quality transit service to increase its attractiveness relative to the private automobile (where practical in the County);
- Create an environment in which autos can play a more balanced role;
- Plan parking supply and cost to be in balance with walking, cycling, transit and auto priorities;
- Improve the efficiency of the goods distribution system;
- Promote inter-modal and inter-line connections;
- Promote new technologies which improve mobility and help protect the environment;
- Optimize the use of existing transportation systems to move people and goods;
- Design and operate transportation systems that can be used by the physically challenged;
- Ensure that transportation decisions protect and enhance the environment; and

[1] Transportation Association of Canada, New Visions for Urban Transportation, 2003

- Create better ways to pay for future transportation systems.

Finally, it is important to stress that the scope of a transportation master plan is based on how, when and where trips are conducted within the study area. This trip-making relationship is shown graphically in Exhibit 1-1:

Exhibit 1-1: The Trip-Making Relationship



1.4 Master Plan Goals and Objectives

The following goal and objectives have been developed by the County of Brant for this CBTMP:

1.4.1 TRANSPORTATION PLAN GOAL

To develop a new comprehensive Transportation Master Plan for the County of Brant that recommends policies, guidelines and an implementation strategy that will assist the County in addressing major transportation issues over the next 20-25 years.

1.4.2 TRANSPORTATION PLAN OBJECTIVES

1. Identify existing and anticipated transportation deficiencies at a strategic level;

2. Through the integration of transportation planning, growth management and land use planning, develop a transportation strategy that accommodates growth and change over the next 20-25 years, and that effectively supports land use objectives as defined in the Official Plan;

3. Assess strategic transportation service options (i.e. roads, transit, other modes) in the context of both urban and rural transportation requirements.

4. Increase the availability of "viable" transportation options in the County by making public transit, cycling and walking more attractive for County residents;

5. Qualitatively assess the role and function of roads within the County, resulting in a new road classification system for use in both the CBTMP and Official Plan;

6. Prepare an action plan for the implementation of the recommendations from the CBTMP that includes a process for the incorporation of findings and recommendations into the Official Plan, and an assessment of the priorities and preliminary cost estimates for any major infrastructure improvements for use in the regular update of the Development Charges Bylaw; and

7. Satisfy Phases 1 and 2 of the Municipal Class EA process dealing with transportation system problems or opportunities, and alternative planning strategies respectively.

1.5 Municipal Class Environmental Assessment Conformity

The CBTMP has been prepared following the Master Planning Process of the *Municipal Class Environmental Assessment Process 2007 (Class EA),* which is a five-phase process required to initiate construction of municipal roads, and water and wastewater projects in Ontario.

The CBTMP conforms to the Class EA description of a master plan previously presented in Section 1.3. The Transportation Master Plan The Municipal Class Environmental Assessment (EA) process clearly defines alternative approaches for completion of master plans within the Class EA context. The County of Brant has prepared the CBTMP based generally on Approach #1. The CBTMP will become the basis for, and be used in support of, future EA studies for project-specific Schedule B and C projects identified within the CBTMP. It provides the context for the implementation of these specific transportation infrastructure projects such as road widenings and construction of new roads, and transportation management initiatives such as localized intersection improvements, and can be referenced in subsequent Class EA projects to establish the need and justification for specific project undertakings.

The Transportation Master Plan is a stand-alone document with a broad level of assessment to describe the overall County of Brant transportation system, and provides the context for implementing specific projects within this system by satisfying Phases 1 and 2 of the Municipal Class EA Process dealing with the system problems and opportunities, and alternative solutions respectively. More detailed investigations will be required for specific Schedule B and C projects recommended in this Plan.

Schedule B projects will require the filing of the project file for public review, while Schedule C projects will have to fulfill Phases 3 and 4 of the Class EA process prior to filing an Environmental Study Report (ESR) for public review. In both cases, the public review period includes a Part II Order appeal mechanism, where an individual can make a written request to the Minister of the Environment to extend the project to a higher level of EA investigation. A Part II Order request can only be made on a project-specific EA, and not on a master plan on which such a project is based. Schedule A and A+ projects generally involve normal maintenance and operational activities with no or minimal environmental effects, and so are pre-approved.

1.6 Conformance to Provincial Planning Policy

Over the past two years the Province of Ontario has adopted a more proactive role in growth management and planning issues. The County of Brant, like all municipalities in Ontario, must

operate within the administrative, legislative and financial framework established by senior levels of government. The key provincial initiatives that provided directives, and were considered in the CBTMP master plan process, were the Provincial Policy Statement 2005 and Places To Grow Plan for the Greater Golden Horseshoe. The results of these current initiatives directly affect future growth in the County, and its policies to accommodate and manage growth.

1.6.1 PROVINCIAL POLICY STATEMENT

The Provincial Policy Statement came into effect on March 1, 2005 under the authority of the Planning Act. It requires that in planning matters, including development of a Transportation Master Plan, decisions "shall be consistent with" policy statements issued under the Act. In the case of this CBTMP, the following Provincial Policies are supported by the County's transportation master planning:

- Policy 1.1: Managing and Directing land Use to Achieve Efficient Development and Land Use Patterns – Section 5 of the CBTMP is based on and supports the growth directions and land use patterns developed for the County in the new Official Plan. This includes ensuring that necessary transportation infrastructure is and will be available to meet current and projected needs;

- Policy 1.1.4: Rural Areas in Municipalities – The CBTMP avoids the planning of unjustified and/or uneconomical transportation infrastructure expansion in rural areas;

- Policy 1.6.5: Transportation Systems -

  - Transportation systems are planned in the CBTMP to facilitate the movement of people and goods, and which are appropriate to address projected needs.

  - The strategic planning direction set for the CBTMP (Section 1.7) is based on efficient use being made of the County's existing and planned transportation infrastructure.

  - The CBTMP considers the connectivity of its transportation infrastructure with adjacent municipalities (Section 5.6) and the integration of transportation modes where appropriate and necessary.

  - Guidelines are provided by the CBTMP project (Section 7.6) to minimize the length and number of vehicle trips and to support development of viable choices for public transit and active transportation in new urban development areas of the County; and

- Policy 1.6.6: Transportation and Infrastructure Corridors – Recommendations are made in the CBTMP (Section 7.1) to identify and protect required transportation corridor improvements and additions in the short, medium and long term.

1.6.2 PLACES TO GROW ACT

Places to Grow is the Ontario government's initiative to manage growth and development in Ontario in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life.[2]

The CBTMP supports a number of elements of Places to Grow for the Greater Golden Horseshoe area, which includes the County of Brant. While the County's conformance to the Act is focused on

[2] Ontario Ministry of Public Infrastructure Renewal

the new Official Plan, the following transportation-related recommendations of the CBTMP are incorporated into new Official Plan policy:

- Where and How to Grow – The CBTMP is based on the designation of settlement growth area established by the new Official Plan. This includes consideration of a Paris/Brantford transit corridor that includes the SW Paris Settlement Area, and general support for the Ministry of Transportation's current planning for a Highway 403/401 corridor in the Brantford to Cambridge Transportation Corridor Environmental Assessment currently underway;

- Infrastructure to Support Growth – Transportation components of this policy provided by the CBTMP include:

  - **Connectivity** between modes of moving people (roads, transit, cycling, walking) and moving goods (roads, rail, air).

  - **Balance** of transportation choices provided by the transit, cycling and pedestrian guidelines and recommendations made by the CBTMP.

  - **Sustainable** planning by encouraging only the most financially and environmentally appropriate modes of future trip-making in the County.

  - **Coordinated** transportation/land use planning provided by the integration of the CBTMP with the new Official Plan;

- Strategies for Moving People – The CBTMP recommends further consideration of plans to extend public transit service into the County, initially in the Paris community, to design the SW Paris urban settlement area to be transit-supportive, to design all new urban settlements to also integrate cycling and pedestrian networks and to promote appropriate forms of Transportation Demand Management (Section 6.5) in the County; and

- Strategies for Moving Goods – The CBTMP recognizes the great importance of the movement of goods within and through the County as part of the County's economic base. This includes recommendations for improved planning and management of truck routes to reduce impacts on associated land use (Section 6.7). It also includes general support for provincial MTO initiatives and studies, such as the Brantford to Cambridge Transportation Corridor Environmental Assessment, to improve roadway infrastructure in the County to accommodate movement of goods.

1.7 Strategic Planning Direction

In a transportation master plan, the first two phases of the Class EA process lead to selection of two types of transportation solutions. These are the preferred "structural" or supply-side roadway network solutions usually involving capital works, and the "non-structural" demand-side Transportation Demand Management (TDM) strategies for the system that influence how, when and why trips are taken. These two types of transportation planning strategies are described as follows and listed on Exhibit 1-2:

Structural Solutions - Structural roadway network solutions are supply-side projects that increase the physical capacity and/or operating capability of the roadway network to carry traffic (autos, buses, trucks, bicycles, pedestrians) safely and efficiently.

Transportation Demand Management (TDM) Solutions - TDM solutions involve demand-side measures to increase the use of alternative transportation modes (transit, cycling, walking), create more efficient travel characteristics (i.e. ridesharing) and better integrate transportation/land use planning (i.e. "Places to Grow", "Smart Growth", "New Urbanism") through mixed land use planning, transit-supportive urban design and density intensification.

Exhibit 1-2: Strategic Planning Options

Structural Solutions (Supply-Side)	TDM Solutions (Demand Side)	
Widen Roads Add Travel Lanes Build New roads Add Bicycle Lanes Improve Roadway Geometrics and Conditions Divert Traffic	**Market Based:** User Pay Parking Pricing **Behaviour Based:** Transit Service Telecommuting Ride-Sharing Peak-Hour Shifts	**Land Use Planning:** Increase Density Mixed Land Use Planning

1.8 Project Direction

The CBTMP was prepared by IBI Group. Technical direction for the CBTMP preparation was provided by a Project Team comprising the following representatives:

Project Team:

Ron Eddy, Mayor
Brian Coleman, Councillor Ward 5
Cynthia Compeau, Director of Public Works
Lee Robinson, Manager of Infrastructure Services
Tyler Lasko, Development Engineering Reviewer
David Johnston, Director of Development Services
Mike Tout, Roads Operations Manager
Rick Knap, Engineering Technologist
Chris Campbell, UMA Engineering Ltd.

Strategic direction in the plan preparation was provided by a multi-jurisdictional Working Group with the following members:

Working Group:

Ron Eddy, Mayor
Brian Coleman, Councillor Ward 5
Derek Hill, Six Nations Public Works Staff
Richard Carpenter, Councillor, City of Brantford
Russell Loukes, Manager Transportation Services, City of Brantford
Cynthia Compeau, Director of Public Works
David Johnston, Director of Development Services
Tyler Lasko, Development Engineering Reviewer
Rick Knap, Engineering Technologist
Chris Campbell, UMA Engineering Ltd.

The IBI Group consulting team was managed by Don Drackley. UMA Engineering Ltd. administered the project on behalf of the County of Brant.

2. EXISTING TRANSPORTATION SYSTEM

According to the Terms of Reference for the CBTMP, the plan is to include:

"*a review of the existing air, rail, commercial vehicle, transit, cycling, and pedestrian infrastructure and the role of each in reducing automobile demands.*"

It is also intended to:

"develop policies and guidelines for all modes of travel including road, rail, air, commercial vehicles, automobiles, transit, cycling and pedestrian."

As a result, the following sections outlines the strategic role of each of these elements of the existing County of Brant transportation system, noting where further policies and guidelines for each are provided in the CBTMP, and the role each plays in reducing automobile travel demands within the County.

2.1 The Road Network

2.1.1 EXISTING ROAD CLASSIFICATION

The existing road network in the County of Brant contains five (5) types of roads as classified by the current Official Plan. This classification system is shown on Exhibit 2-1 with descriptions from the current Official Plan provided as follows:

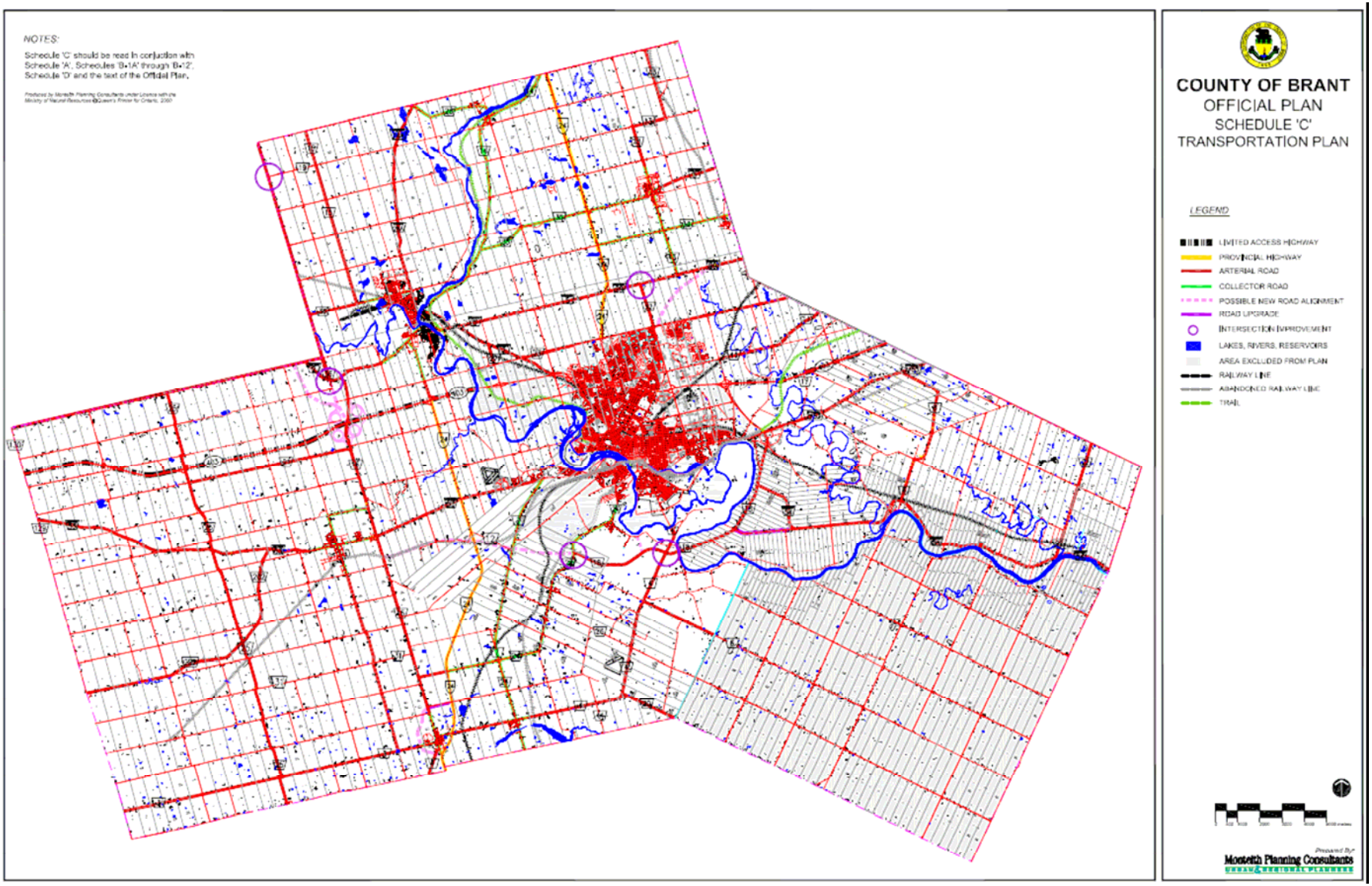
Arterial Roads - Arterial roads are existing roads of 2 to 4 traffic lanes that were either former Provincial Highways transferred to the County, such as County Highway 2/King Edward Street/Paris Road, County Highway 53/Colborne Street West, Colborne Street East, Pinehurst Road and County Highway 54, or roads that have been identified as County Roads and noted on Schedule "C" of the existing Official Plan as Arterials (see Exhibit 2.1). Note that the existing Official Plan including Schedule "C" is now being reviewed as part of the County's mandatory five-year Official Plan Review.

Due to existing development, desired right-of-way widths may not always be achievable for Arterials. Wherever possible, an Arterial Road right-of-way width should be 30 metres. See Section 6.2 of this CBTMP for an expanded road classification system that responds closer to the role, function and characteristics of roads than the classification system included in the current Official Plan. Also see Section 4.2.1 of the current Official Plan for the following Arterial road provisions:

- *The number and location of access points from abutting properties along an Arterial may also be restricted as part of the County's objectives for access management along major roads. Access management is intended to protect and maintain the function of the Arterial roads to facilitate the inter-municipal and through municipal movement of high volumes of traffic to and from major traffic generating sectors in the County.*

- *New industrial, commercial, institutional, and multiple family residential uses may have access to Arterial roads within Settlement Areas and land use specific designations, but in each instance the County attempts to group land uses in order to reduce the number of access points which could hinder the movement of traffic. Strip or linear development can be discouraged.*

Exhibit 2-1: Existing Overall Roadway Network (Official Plan Schedule "C")



Collector Roads - Collector are currently described as existing and proposed roads with a minimum of two traffic lanes and a right-of-way width of 20 to 26 metres, which are designed to collect and carry medium volumes of local traffic to arterial roads or to distribute traffic to the local roads as well as provide access to abutting properties. Whenever possible, widening shall be sought to provide for a 26-metre right-of-way. Section 6.2 of this CBTMP presents a revised classification system and description for Collector roads.

Local Roads - Local roads are existing and proposed roads with two traffic lanes and a right-of-way width of 20 metres which are designed primarily to provide access to abutting properties. They should be designed so as to discourage the movement of through traffic and function as local distributors of traffic to the local roads.

Private Roads - There are very few private roads in the County that serve development. There may also be private roads developed in the future as part of condominium residential projects and modular home parks. The use of private roads in the County is to be minimized, and the County has no jurisdiction, responsibility or liability over the construction, operation or maintenance of private roads.

Provincial Highways[3] – There are two provincial highways located within the County of Brant, Highway 24 and Highway 403, which are under the control and jurisdiction on the Ministry of Transportation (MTO).

- Highway 24 consists of two distinct sections of highway generally described as follows:
    - The southerly section of Highway 24 is located between the north limit of the Town of Simcoe in Norfolk County to a point approximately 585m north of Highway 403, where it changes to Rest Acres Road under the control and jurisdiction of the County of Brant; and
    - The northerly section of Highway 24 is located between the north limit of the City of Brantford and the south limit of the City of Cambridge.
- Highway 403 is an east-west controlled access highway extending across the entire length of the County providing linkages to other areas of the province.

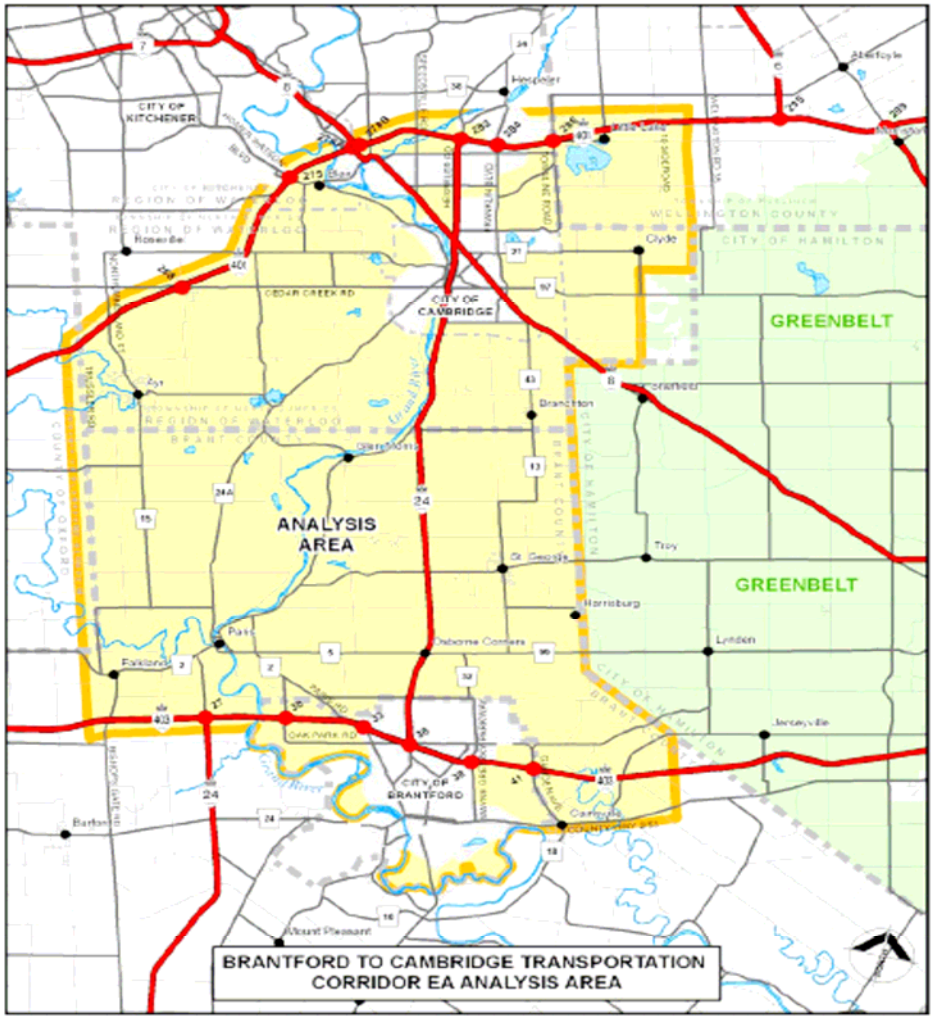
General ministry requirements for any access changes or improvements in the vicinity of a provincial highway are reported in Section 6.4 of this TMP.

Brantford to Cambridge Environmental Assessment – MTO has initiated an Individual Environmental Assessment study under the Environmental Assessment Act to address the long-term problems and opportunities (to 2031) relative to the inter-regional movement of people and goods in the Brantford to Cambridge area. This study replaces the former Highway 24 Transportation Corridor Class EA Study. The analysis area of this new study is shown on Exhibit 2.2.

Niagara to GTA Corridor Planning and Environmental Assessment – The key map in the December 2007 study plan of this MTO study shows a preliminary study area that abuts the Brant/Hamilton boundary. It is too early to determine the potential impact of this study on the County of Brant.

[3] Information on Provincial Highways in Section 2.1.1 was provided by MTO in their letter to IBI Group dated November 3, 2008

Exhibit 2-2: Brantford to Cambridge Transportation Corridor EA



This Analysis Area may be refined as determined appropriate during the EA to reflect study findings and input received through consultation and engagement.

2.1.2 EXISTING ROAD NETWORK TRAVEL PATTERNS

Information on travel patterns within and through the County of Brant was developed for the CBTMP using historical Statistics Canada employment data by Place of Work from 2001 as the base. This is the same data used in the County's new Official Plan to forecast employment in the County.[4] It provides commuting patterns within the County in relationship to the surrounding region. The following basic demographic data about the County was established from this source:

- County of Brant Population: 31,670
- People that work in County of Brant: including residents and commuters 9,745
- People who live in County and Work in Brantford; 4,485
- People who live in Brantford and Work in the County: 3,625
- People who travel to the County to work: 4,195
- People who travel from the County to work: 7,000

[4] Brant County Official Plan Review, Growth Analysis Study, 2006-2031, Watson Assoc.

These regional commuting patterns are illustrated on Exhibit 2-3 for commuters from the County, and Exhibit 2-4 for commuters to the County.

Exhibit 2-3: Destinations of Commuters from County of Brant

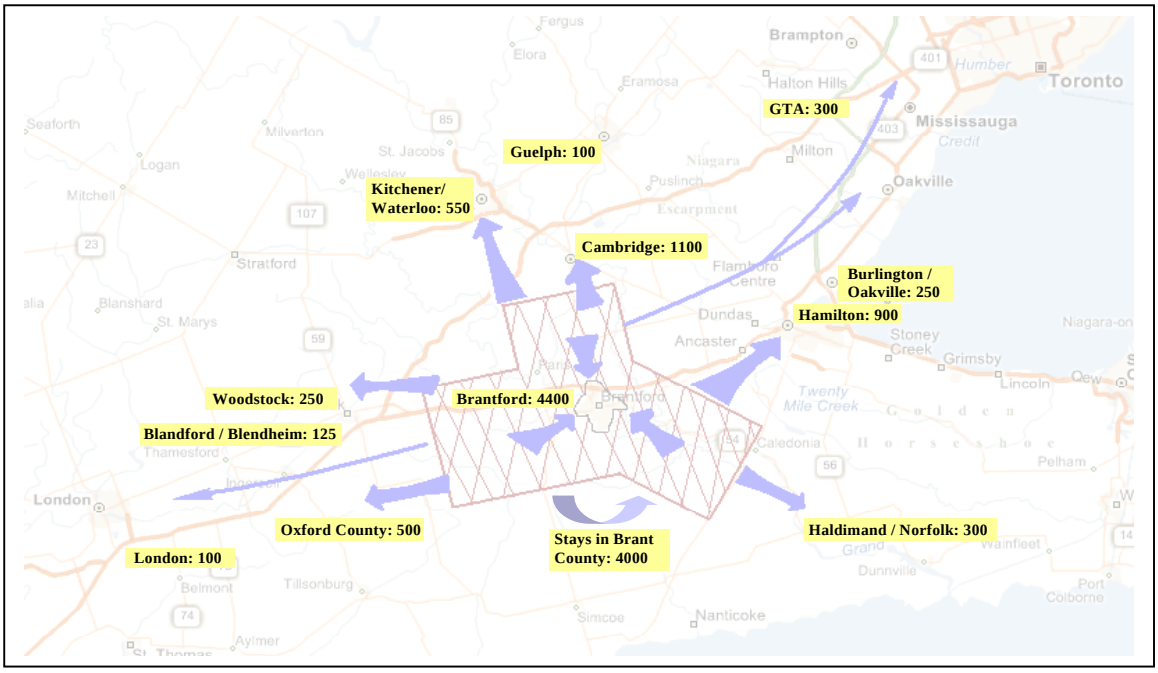
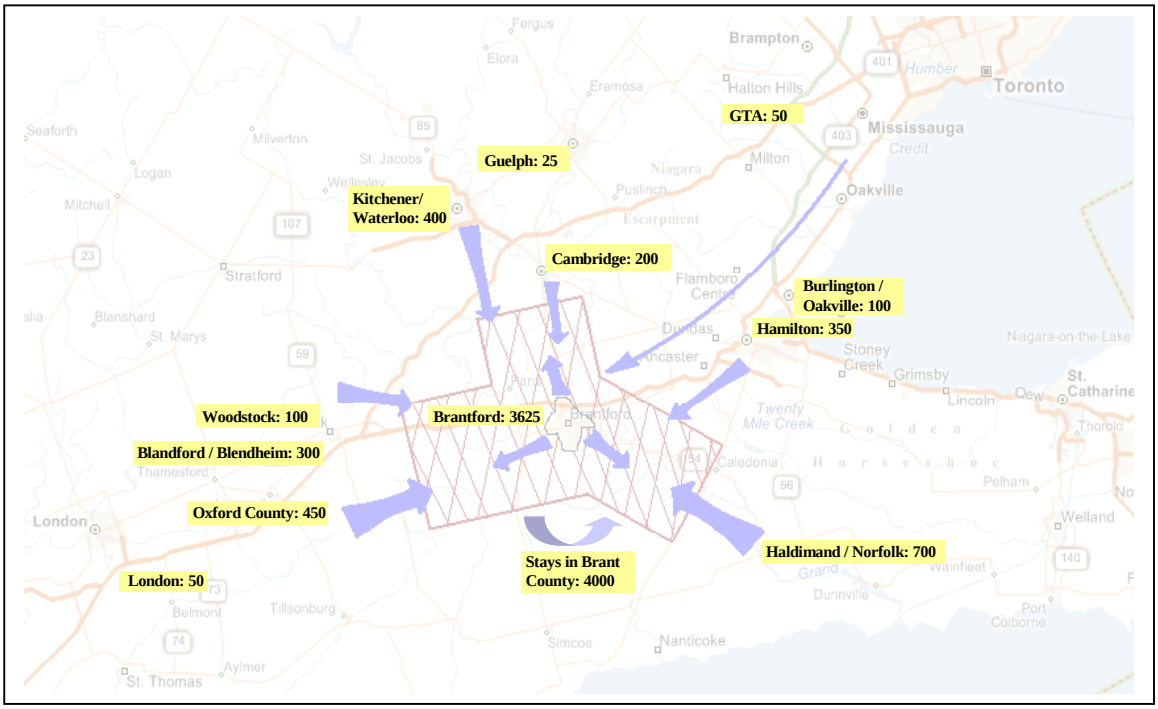


Exhibit 2-4: Origins of Commuters to County of Brant

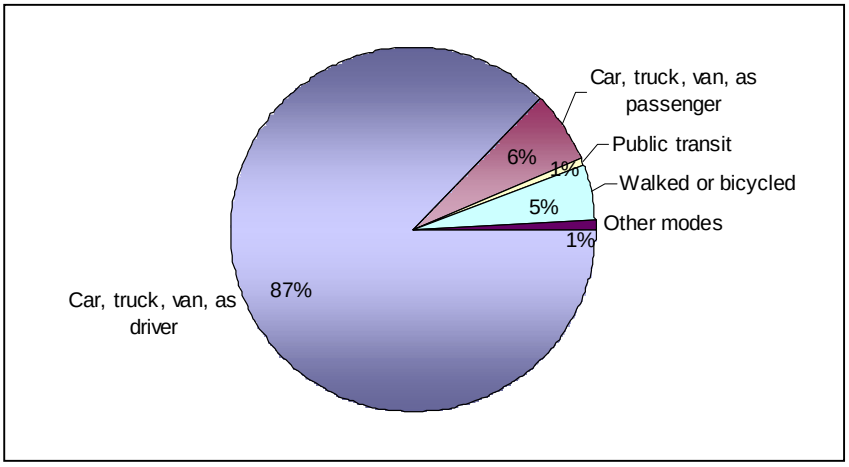


The general observations from these commuting patterns are that they are generally dispersed from the County, with Brantford as the largest destination with multiple roadway routes in and out of the City. Other major destinations are Cambridge and Kitchener-Waterloo to the north and Hamilton to the east. For traffic commuting to the County, it also arrives from all directions including Brantford, with Haldimand, Norfolk and Oxford Counties being large sources of commuters.

The main conclusion reached from these commuting patterns is that the provincial highways and County Arterial roads are the key linkages for travel from the County of Brant to other employment centres. Conversely, commuting to the County originates largely in surrounding urban and rural municipalities (Counties) using a variety of County roads and limited use of major corridors.

There is also significant reliance on the use of private automobiles in making these weekly commutes. This current trend should be recognized when considering where and how to address growth in automobile use within the County. This dependence on the automobile as the primary mode of transportation in the County is shown by the mode share of travel shown in Exhibit 2-5, with a strong dependence on the private automobile:

Exhibit 2-5: Mode Share of County Travel



2.1.3 EXISTING ROAD NETWORK CAPACITY

To understand how the County of Brant roadway network serves travel needs, the capacity of the network roads was first established. Using capacity standards from sources such as the Highway Capacity Manual, roads in the County are expected to provide the following basic operating characteristics in urban and rural setting defined as follows:

Urban Settlements - The County's settlement areas as designated by the Official Plan represent primarily urban environments where the roadway network operates. These areas are typically isolated within the general rural character of the County, but where most of the County growth has occurred in the past. Development within these areas is typically urban with higher densities of population and employment than the surrounding rural area. The roadways in urban settlements are characterized by adjacent commercial, industrial and residential development. Driveway density is higher than in the rural areas and major intersections may be controlled by traffic signals.

Rural - Development within the rural areas of the County is sparse, with very low densities of population and employment. However, agricultural and especially aggregate industry operations can represent major traffic generators, especially for heavy vehicles (trucks). Roadways in these

areas are generally characterized by adjacent agricultural development, driveway density is very low and major intersections are only occasionally controlled by traffic signals.

The differentiation between the operating speed and capacity of the road network in urban settlement vs. rural areas is summarized on Exhibit 2-6:

Exhibit 2-6: Basic County Road Network Operating Characteristics

Road Type / Classification		Free Flow Operating Speed (km/h)	Capacity vehicles/lane/hour
Provincial Highway		80 - 100	1,000
Arterial	**Urban**	50 – 80	800
	Rural	60 – 100	800
Collector	**Urban**	50 – 60	600
	Rural	60 – 90	600
Local		50	300

2.1.4 EXISTING ROAD NETWORK LEVEL-OF-SERVICE

Transportation system planning uses traffic volumes and established roadway or intersection capacities to determine a volume/capacity or v/c ratio for links or intersections in a roadway network, which equates to a measurement of Level-of-Service (LOS). In the case of the County of Brant, strategic turning movement counts were used to establish existing LOS at strategic locations on the County's road network in order to quantitatively identify any capacity deficiencies in the network.

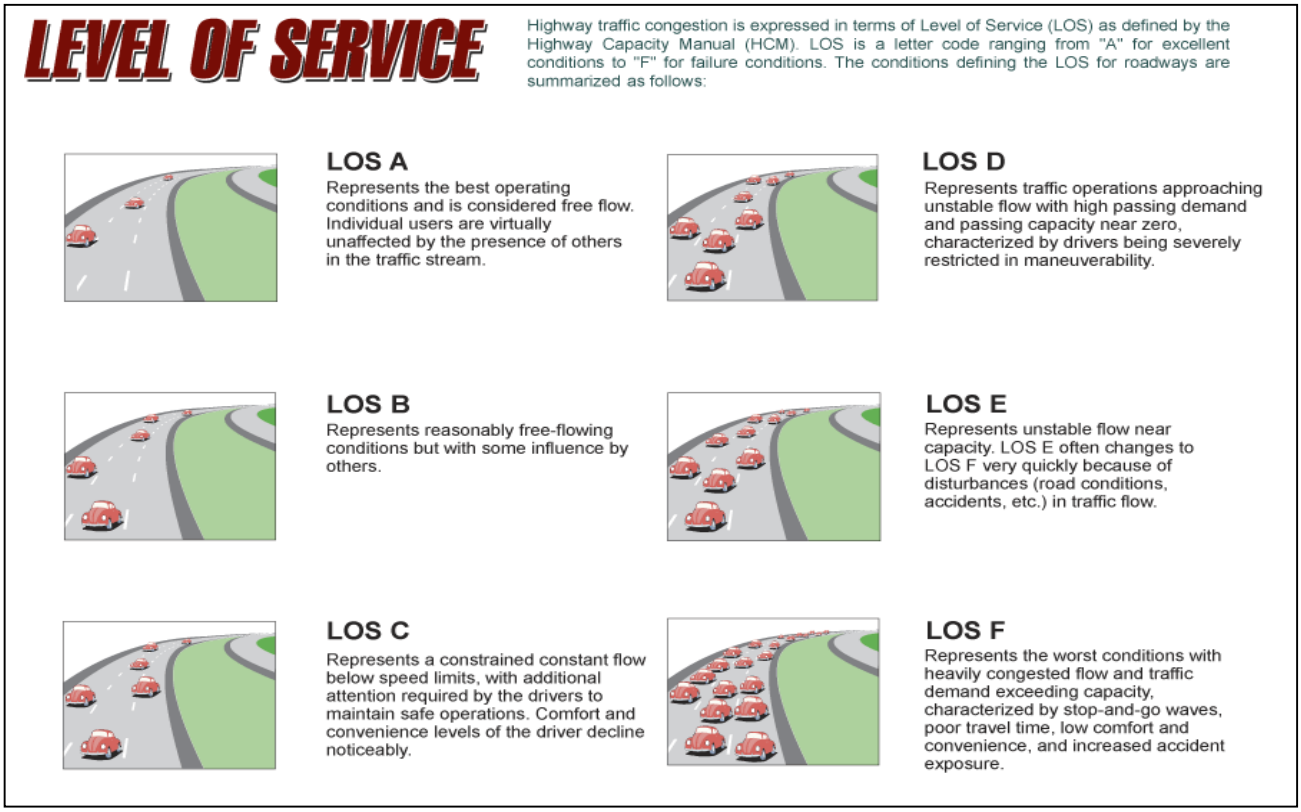
LOS is measured by six levels or grades of generalized traffic conditions, generally characterized as follows, by which transportation planners determine the quality of service on roads and at intersections.[5]: This LOS rating system is also illustrated on Exhibit 2-7.

A= Free flow B=Reasonably free flow C=Stable flow

D=Approaching unstable flow E=Unstable flow F=Forced or breakdown flow

[5] Highway Capacity Manual

Exhibit 2-7: Road Network Level of Service Ratings



Source: www.route228.com/virtMtg/elements/LOS.gif

As traffic LOS on roadways and at intersections worsens, associated socio-environmental impacts result from the restricted traffic flow, indicated by the following characteristics of roadway effectiveness:

a. Vehicle emissions increase and concentrate along more congested roadway sections as engines run less efficiently (i.e. idling);

b. Vehicle hours of delay increase;

c. Vehicle kilometres of travel increase as traffic attempts to find other and often less direct alternatives to congested routes;

d. Vehicle hours of travel time increase because of the long travel distances, diversions to alternative routes, slower speeds and delayed conditions;

e. Fuel consumption increases owing to these less efficient travel characteristics; and

f. Driver frustration and unsafe practices increase as motorists deal with reduced LOS.

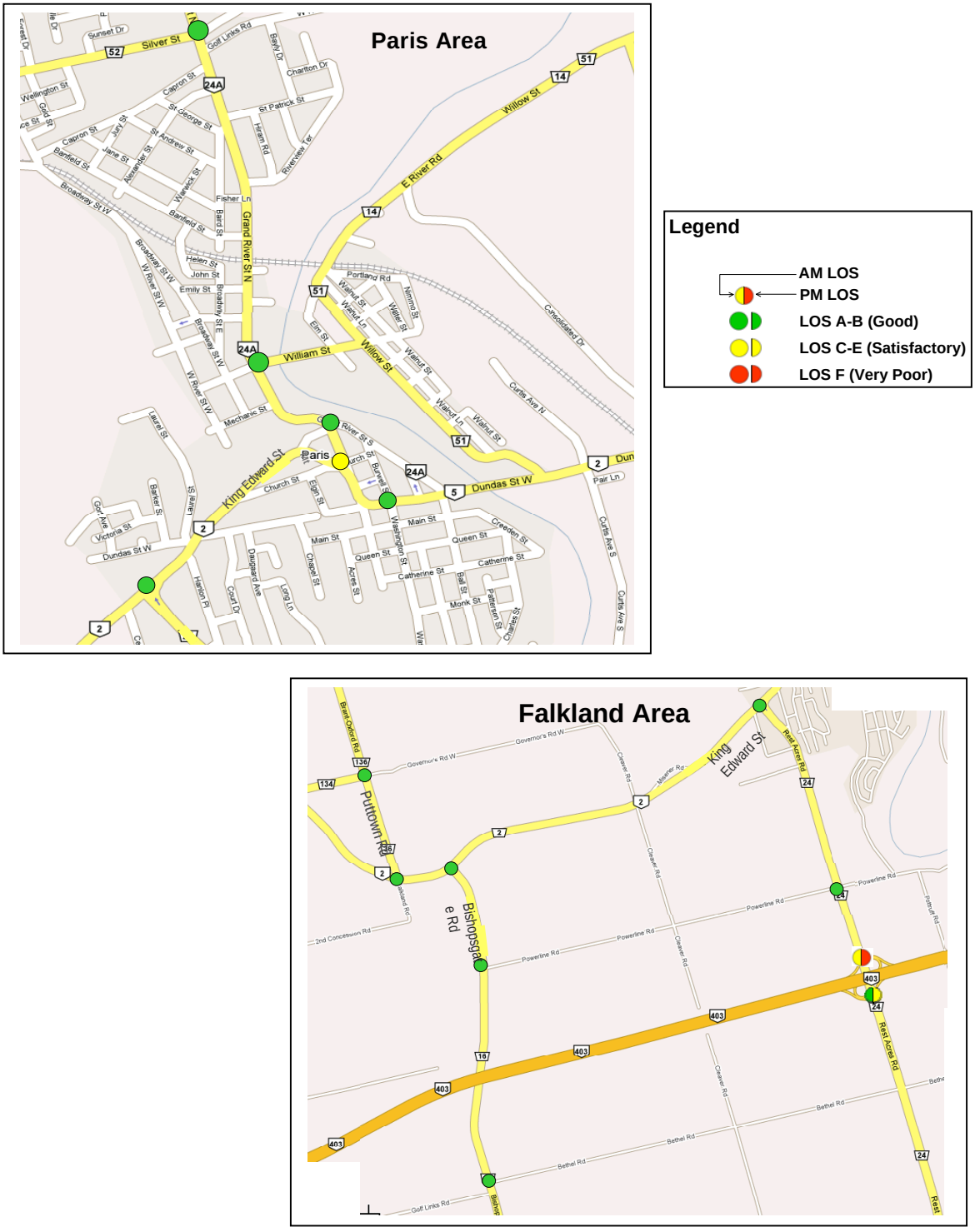
To determine if any capacity and/or operational deficiencies are present in the County's road network that would presently cause these types of impacts, turning movement (TM) counts and Automatic Traffic Recorder (ATC) counts were collected at 44 strategic roadway network intersections listed on Exhibit 2-8:

Exhibit 2-8: LOS Analysis Intersections

Jurisdiction	Key Area	Intersection		Type of Count
Brant County 8 intersections	Potential By-Pass Falkland	Brant Oxford Road	Governors Road West	TM
		Brant Oxford Road	County Highway 2	TM
		County Highway 2	Bishopsgate Road	TM
		Bethel Road	Bishopsgate Road	TM
	Future Industrial Area	Power Line Road	Bishopsgate Road	TM
		Power Line Road	Rest Acres Road	TM
		Power Line Road	Oak Park Road	TM
		Power Line Road	Paris Road	TM
Brant County 11 intersections	Burford	Maple Avenue North	South of Highway 403	ATR
		Maple Avenue North	South of Douglas Street	ATR
	Brant Growth Areas	Mount Pleasant Road	Phelps Road	TM
		County Highway 54	Phelps Road	TM
		County Highway 54	Pauline Johnson Road	TM
		Brant County Road #18	Colborne Street East	TM
	Paris Urban Area	Grand River Street North	Silver Street	TM
		Grand River Street North	William Street	TM
		Grand River Street South	Dumfries Street	TM
		Dumfries Street	King Edward Street	TM
		Dundas Street West	Washington Street	TM
		King Edward Street	Rest Acres Road	TM
City of Brantford 3 intersections	Northern portion of the City	King George Rd (Hwy 24)	Fairview Drive	TM
		Power Line Road	Park Road	TM
		Power Line Road	Wayne Gretzky Parkway	TM
MTO 22 intersections	Highway 403 Interchanges	Highway 403	Middle Townline Road	ATR Count, TM
		Highway 403	Rest Acres Road	ATR Count, TM
		Highway 403	Oak Park Road	ATR Count, TM
		Highway 403	County Highway 2	ATR Count, TM
		Highway 403	Highway 24 (King George Road)	ATR Count, TM
		Highway 403	Wayne Gretzky Parkway	ATR Count, TM
		Highway 403	Brant County Road #18	ATR Count, TM
		Highway 24	Powerline Road	TM
		Highway 24	Governors Road East	TM
		Highway 24	Blue Lake Road	TM
		Highway 24	Lockie Road	TM
	Highway 24 south of Hwy 403	Highway 24	Bethel Road	TM
		Highway 24	Robinson Road	TM
		Highway 24	Colborne Street West	TM
		Highway 24	Godby Road / Arthur Road	TM
		Highway 24	Ellis Avenue	TM
		Highway 24	Maple Grove Road	TM
	Potential By-Pass Scotland	Highway 24	Elliott Road	TM
		Highway 24	Oakland Road	TM
		Highway 24	Simcoe Street (Vanessa Road)	TM
		Highway 24	Jenkins Road	TM
		Highway 24	Burford - Delhi Townline Road	TM

By comparing the recent (2005-2006) traffic counts at these intersections with established industry capacities, no existing LOS deficiencies were measured in the current County of Brant roadway network. Examples of the LOS analysis for the Paris and Falkland areas are shown on Exhibit 2-9 showing mainly LOS A-C conditions at the strategic intersections analysed.

Exhibit 2-9: Paris and Falkland Area LOS Analysis



Traffic counts are used in transportation planning to identify capacity and operational deficiencies in the road network, by comparing the design capacity of intersections and road sections with the volume of traffic currently being served. The main conclusion reached from the analysis is that with the exception of the westbound off-ramp from Highway 403 onto Rest Acres Road that can experience relatively high peak hour volumes of southbound left turns onto the road (see Exhibit 2.8), the analysed intersections are currently operating at a good Level-of-Service, and no capacity or operational deficiencies were noted.

A third type of road deficiency involves perceived deficiencies. Some specific roads and intersections within the County were noted by some residents as being deficient, or in need of upgrading owing to growth in area traffic. For example, some intersections along Grand River Street North in Paris were noted as being very busy and difficult for pedestrians to cross because of the growth in vehicle and truck traffic. While perceived deficiencies are generally identified through resident complaints, in the case of the County of Brant none of the perceived problems noted during the preparation of the TMP were found to present measurable capacity or operation deficiencies.

However, resident perceptions about roadway deficiencies and safety problems should still continue to be addressed by the County to ensure there are no geometric design, line of sight, signal timing or traffic speed and volume issues that may warrant further consideration of improvements. Addressing these types of location-specific issues is beyond the strategic scope of the TMP, and should continue to be addressed through specific intersection control and operational studies. Capacity and operational deficiencies may also evolve in the future if parts of the road network are not capable of accommodating the growing traffic volumes and turning movements generated by the amount and patterns of population and employment growth in the County. Future conditions are further analysed in Section 4.3 of this Master Plan.

2.2 Commercial Vehicle Movement

Public input during the preparation of the CBTMP shows that the movement of heavy commercial vehicles in the County, and the impact this has on affected communities and land uses, remains a major transportation-related issue (see Section 3 for further information on Key Transportation Issues). At the same time, movement of goods within and through the County is a reflection of the economic vitality not only of the County, but also southern Ontario. As a result, there is a recognized need to develop appropriate policies to accommodate and manage goods movement by truck in the County, while at the same time avoiding travel routes that are not suited to this type of traffic, and protecting land uses that are sensitive to such traffic.

2.2.1 GOODS MOVEMENT/TRUCK ROUTE POLICY CONSIDERATIONS

The demand for goods movement by road is currently growing at a faster rate than personal travel in many areas. Changes in industry logistics and consumer purchasing patterns are contributing significantly to the change. Actually, goods movement activity in Canada is expected to increase by some 60% by 2020[6]. As a result, the significance of goods movement is increasing in terms of both its role in the municipal economy, as well as its impact on quality of life (both positive and negative).

With the population of the Greater Golden Horseshoe, in which the County of Brant is located, expected to grow at a rapid rate, and with the auto-dependent nature of most suburban and rural development and the increase in the truck component on roads all indicate that congestion will be a significant issue on provincial highways and municipal roads in years to come over some parts of the system. Combined with this is the increased amount of land that will be required for goods movement activities.

[6] Government of Canada, Transportation Canada, “Straight Ahead: A Vision for Transportation in Canada”

The County of Brant, like many other municipalities, does not have explicit policies pertaining to the movement of goods. While in the past this has not been a serious issue, it is now taking on increasing importance as industry, aggregate extraction and other users of heavy trucks continue to grow in and around the County. Commercial truck traffic is contributing to growing road congestion in downtown Paris and on other key routes such as Highway 24, with consequential negative impacts on the environment, the economy and the quality of life.

Policy guidelines in this area can provide meaningful direction for future development decisions in respect of the following areas:

- Ensuring that the requirements for infrastructure and facilities in support of goods distribution are taken into account in formulating land use policies and in the approval process for major development projects;
- Contributing to efficient and competitive logistics facilities as an attractor for commercial and industrial economic development projects;
- Establishing guidance to provide balance between environmental, social and economic responsibilities, while establishing truck route bylaws and policies;
- Sending clear signals with respect to relative roles and responsibilities of residential, recreational, industrial, institutional and commercial developers on what to expect in both the provision and restriction of goods movement;
- Promoting modal integration and innovation while capitalizing on the natural advantages that the County of Brant offers through the location of Highway 403, Highway 24 and the CN Dundas Subdivision rail line; and
- Investing in the most promising infrastructure improvement projects for goods movement, and attracting collateral investment from other participants.

2.2.2 KEY ISSUES ASSOCIATED WITH GOODS MOVEMENT IN THE COUNTY

The County of Brant is strategically located west of the Greater Toronto Area, between Highway 401 and 403 and near the Niagara Gateway for roads that serve domestic, regional and trans-border trade. These are natural advantages that have developed over time. The key issue for policy and planning of goods movement by road in the County is to preserve and enhance these advantages in an increasingly competitive context. More specific issues are:

Competitive Pressures: The competitive context is both internal and external. Internally in the County, population growth and personal mobility will create pressure on both land resources and transportation infrastructure. Congestion is expected to be a visible outcome of this internal competition. Externally, there will be competition from other locations in southern Ontario to attract industry/commerce and employment.

Truck Movements: It is one thing to be endowed with excellent facilities such as provincial highways; however, the County road network, and maintenance of adequate truck routes are also vital to sustain the efficient movement of trade in the County. In the County, as in many other municipalities across North America, trucks carry a large proportion of the total freight moved in the region.

Compatibility: In the Paris and Cainsville areas of the County, trucks using roads through downtowns and near predominantly residential areas to connect with highways, avoid delays at stop lights or congested conditions, plus the loading and unloading on these roads are some of the current specific issues noted by the public. In some cases, for example along King Edward Street in Paris, and Blossom Avenue in Cainsville, some residents felt that the volume and character of this truck traffic is not compatible with the predominantly residential land use along the routes. On other routes, such as Grand River Street North in Paris, truck traffic impacts on the operational capacity of the road and intersections, thereby reducing the level of service of roads through largely commercial and service areas.

Economic Development: According to the existing County Official Plan[7], the County is planning further industrial, extraction and commercial development in the south, southwest and north Paris areas, and possible industrial growth in the Cainsville area. In turn, initiatives to attract this growth will eventually lead to increased demand for all types of freight transportation especially by road.

Role of Railways: The CN Dundas Subdivision rail line through the County extending east into the GTA and west to the Windsor/Sarnia gateway provides for both freight and passenger service (see Section 2.5). The role of the railway to move goods within the County is limited to businesses along this corridor, although opportunities exist for multi-modal integration between rail and road at many existing and potential connections. In most cases, rail needs the trucking connection to meet the just-in-time and door-to-door delivery requirements of modern manufacturing and industry.

The County faces the challenge of balancing responses to the local specific issues (i.e. constituents' issues) versus the longer-term initiatives to satisfy its economic development potential. Policies and guidelines will be needed to clearly maintain a balance between local priorities and the regional requirements for trade and commerce so that employment growth and population growth remain in alignment.

2.2.3 EXISTING COUNTY OF BRANT TRUCK ROUTE POLICIES

Official Plan (Current)[8] - The current Official Plan (2000) states that "*the need for a designated truck route is a multi-regional issue that cannot be resolved at the local level"*. When prepared, it expected that a truck route study underway at that time would (see next section) identify a truck route for the County that would not negatively impact communities in the County. It was also expected that the County would then implement a truck route in consultation with neighbouring municipalities.

The current Official Plan also states that the County "*may exercise its legislative authority to ensure trucks are restricted to those origins and/or destinations within the municipality and/or specific communities*". Finally, the Plan states that "*Truck haul routes are restricted to the Provincial Highways and Arterial Roads as indicated on Schedule C".* Part of the function of Provincial Highways is the efficient transport of goods, and they are open to all users.. However, the use of Arterial Roads as truck routes results in routes such as Grand River Street through Paris being available as a truck route, while the portions of King Edward Street and Rest Acres Road in south Paris are not truck routes because they are designated as Collector Roads. The same situation currently exists on portions of St. George Road and Beverly Street East in St, George, and Silver Street/Keg Lane in north Paris that are designated Collectors Roads in the Official Plan, and are therefore restricted from being used as truck routes.

[7] Adopted November 7, 2000
[8] Ibid

This use of Official Plan road designations to restrict truck routes acts as a type of de-facto truck route bylaw for the County, but needs to be reviewed in terms of how well it responds to new and emerging good movement needs, and associated community needs.

As described next, the Truck Route Study did not result in approval of designated truck routes in its study area. As a result, the County of Brant currently has no truck route bylaw as its legislative authority to support the designation and enforcement of truck routes, or policies and guidelines to manage such routes. Both the positive and negative impacts of goods movement by truck have been identified in the CBTMP. While the CBTMP is not intended to develop a truck route bylaw or identify exact truck routes, Section 6.7 does introduce the County to the strategies and options available for designating and managing truck routes. These options can be further developed by the County as supporting Official Plan policies and in the development of a truck route bylaw.

Truck Route Study, June 2004 - In response to Official Plan policy, the County prepared the County of Brant Truck Route Study dated June 2004.[9] The primary purpose of the study was to establish truck routes within the study area bounded by the Grand River to the east, Highway 403 to the south, Oxford County to the west and the Region of Waterloo to the north. These truck routes were to include a bypass for trucks specifically around the Paris community. With public and industry consultation, the study identified this bypass alignment to address the needs of commercial vehicle traffic, while mitigating impacts on the social, cultural, natural and economic environments. The study area extended from the Region of Waterloo boundary south to Highway 403, and from the County of Oxford boundary east to the West River Road/Green Lane area.

The study concluded with two possible truck routes recommended for further consideration, namely:

- Alternative 2 Puttown Road extending along the Brant-Oxford Road and Puttown Road west of Paris, connecting to Highway 403 via the existing crossing of the Nith River to Bishopsgate Road, Powerline Road and Rest Acres Road; and

- Alternative 4: Green Lane extending along County Highway 24A to a new road east of Paris crossing the Grand River to link with Green Lane, Paris Road and Highway 403.

Both of these final alternatives would require some new road construction, a waterway crossing and improvements to shoulder widths on existing roads forming the bypass routes. As a result, the study also recommended that the County initiate a Schedule “C” Municipal Class Environmental Assessment (EA) of the two final alternatives to prepare preliminary designs and address environmental impacts and public concerns in much greater detail. But first it was recommended that County Council adopt the findings of the Truck Route Study.

The proposed adoption of the study, with its two final truck route alternatives, was actively opposed by many property owners along these two selected routes, based largely on concerns about the social and natural impacts of transforming certain rural roads into parts of a designated Paris bypass truck route. As a result, Council did not adopt the Truck Route Study.

2.2.4 ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Although there is no legislative requirement to conduct a Class EA to designate truck routes as part of an Official Plan policy or truck route bylaw the types of physical roadway infrastructure improvements needed in the Paris area to provide a functional truck bypass of the community are expected to require EA approval. Any municipality can pass a bylaw identifying existing roads where trucks are either allowed or restricted depending on the type of truck route management in

[9] Totten Sims Hubicki Associates

effect. The issue in the Paris area is that the two preferred bypass routes selected in the 2004 study require varying degrees of geometric and route improvements to accommodate heavy vehicles. If such improvements are deemed to change the purpose, use or capacity of the roads in question, a Schedule C Municipal Class EA is required.[10] Similarly, if a new linear paved facility such as a waterway crossing is required as part of the truck route, a Schedule C Municipal Class EA would be required.

A Schedule C EA requires completion of Phases 1 through 4 of the Municipal Class EA (2007) process. Phases 1 and 2 include the identification of the problem or opportunity being addressed, and evaluation of alternative planning solutions respectively, both of which are addressed in the CBTMP. Phases 3 and 4 require preparation of design concepts and completion and approval of an Environmental Study Report, all conducted with early and thorough public consultation. Schedule C transportation projects generally include the construction of new facilities and major expansion of existing facilities.

In summary, if it is possible to identify truck routes on existing roadway infrastructure in the County of Brant, where no associated or only minor reconstruction is required, then these roads could be designated as truck routes without the need for a full Schedule C Municipal Class EA, and the public consultation requirements and appeal provisions that come with that process. At the same time, if Council was to consider passing a truck route bylaw that identified a specific route, say around the Paris area, then the County's public hearing provisions to pass a bylaw, and appeal provisions of the Ontario Municipal Board could apply.

2.3 Public Transit

The County of Brant currently benefits from a very limited public transit service. A private firm, Paris Transportation Service (also known as Paris Taxi), provides a car or minivan shuttle service between the Brantford terminal and Paris two times a day Monday to Friday. The cost is $6.00 per trip and usage is very light. Paris Transportation took over the service from All Around Transportation four years ago, and until August 2007 ran the weekday shuttle service six (6) times a day. Brantford Transit included a Paris service until about 10 years ago.

The only transportation service that the County subsidizes is for specialized transportation services through Paris Transportation Service. The County has a contract with Paris Transportation Services to provide a pre-booked, shared ride, accessible door to accessible transportation service for persons that have a temporary or permanent physical disability or who are intellectually challenged. The service is provided from point to point within the County and from locations within the County to locations in Brantford depending on the client's requirements. The client pays the provider $6 per trip each way regardless of the destination. The County is billed $20 plus GST for each trip regardless of the destination.

No other public transit service exists within the County, but some comments were made by the public during the Public Information Centres that expanding some type of transit service into the County would provide residents with more of a choice in travel mode.

In assessing future transportation needs for residents as part of the CBTMP process, the question of introducing public transit as an alternative to continued reliance on the automobile is a key consideration. In general terms, an effective and efficient urban transit service provides demonstrable economic and environmental returns on the investment made, as well as supporting access to the community for all residents. The returns include the building of strong, sustainable communities through reductions in greenhouse gas emissions and protection of green space.

[10] Refer to Appendix 1 of the MEA Municipal Class EA (amended 2007)

Increased transit use is also essential for supporting more efficient land use patterns. It can reduce the costs of traffic congestion, the need for road and highway spending and the high cost of continued suburban sprawl.

Good quality public transit also provides residents with access to jobs, health care services, social services and educational opportunities. Greater use of transit supports the reduction and containment of pollution and accident related health care costs (pollution- related illnesses alone cost the Ontario economy $1 billion per year, according to the Ontario Medical Association). Providing good, fully accessible transit in communities of all sizes also provides mobility to the thousands of Ontarians with disabilities and the increasingly aging population, and ensures that all residents can continue to be active in their community.

For the County of Brant, a public transit service may be considered initially along the major travel corridor linking Paris with Brantford, namely Paris Road, with consideration given in the future to extended services to the Cainsville area if demand and financial resources permit.

In the short term, there are a number of alternatives for introducing transit service to the County which are outlined in Section 6.6 of this Master Plan.

2.4 Active Transportation (Cycling & Walking)

The basic non-motorized or active modes of transportation using cycling and walking take place throughout the urban and rural areas of the County of Brant primarily in response to leisure and recreation activities, group activities such as bicycle tours, routes to schools and general short distance transportation for all residents and visitors. There are no formal bikeways in the County except along multi-use off-road trails, and no marked bike lanes on County Roads. Most cycling that is not on off-road trails takes place by sharing lower volume roads in and around the settlement areas, and along the gravel shoulders of County roads.

The main cycling and walking destinations/attractions in the County are shown on Exhibit 2-10 provided courtesy of the Grand River Conservation Authority (GRCA).

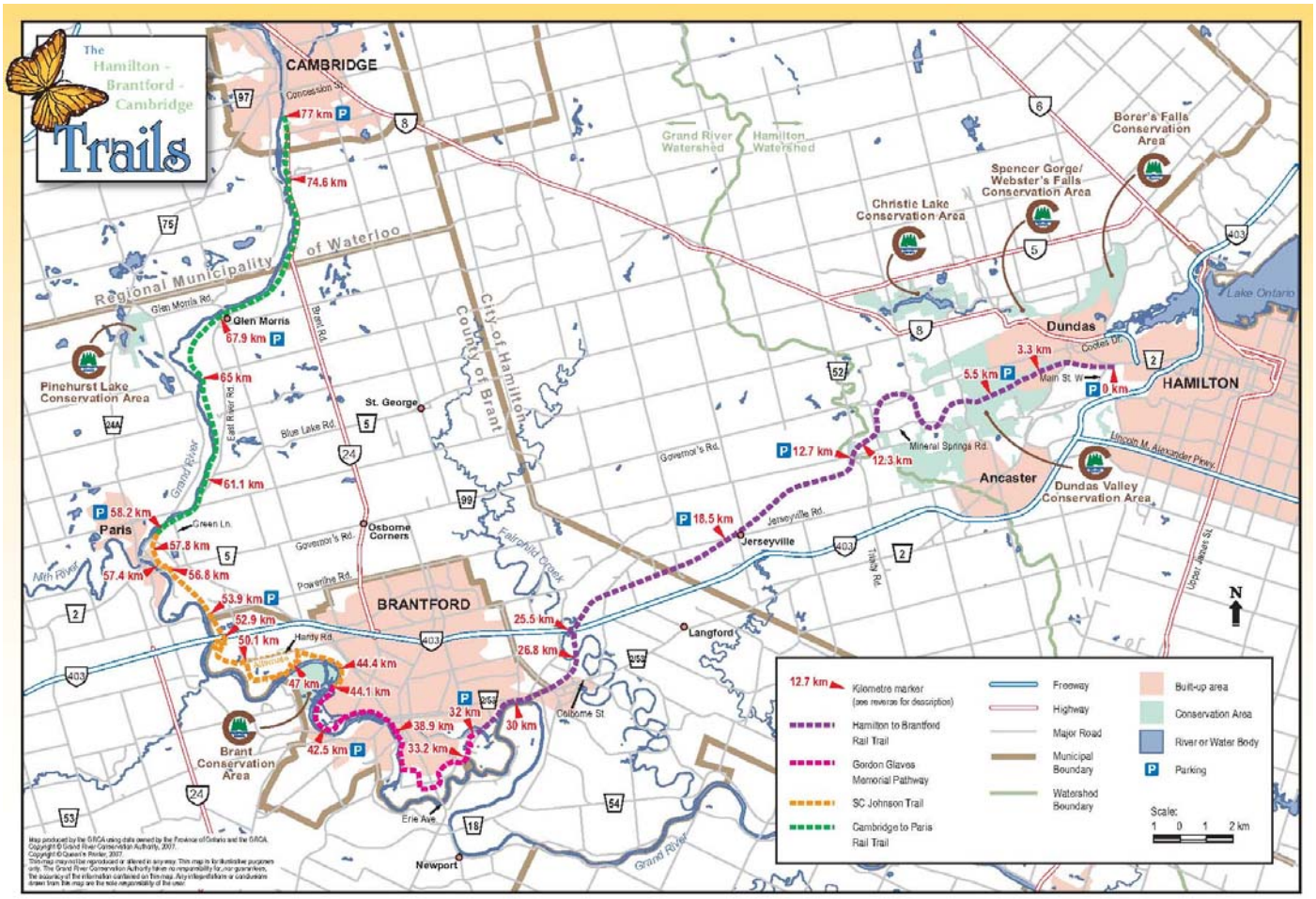
The GRCA owns and operates the following three multi-use trails that are built on abandoned railway corridors within the County of Brant:

- Hamilton to Brantford Rail Trail linking Hamilton and Brantford;
- SC Johnson Trail linking Brantford and Paris; and
- Cambridge to Paris Rail Trail linking Paris and Cambridge

These 77 km of trails form a major component of the southern Ontario loop of the Trans Canada Trail system. They also link with the Gordon Graves Memorial Pathway along the Grand River in Brantford. Walking trips are typically characterized by shorter trip lengths under two kilometres. For distances over two kilometres, the percentage of trips made by walking decreases dramatically. Cycling can be used for recreational and/or utilitarian (i.e. commuting) purposes. Most trips tend to be less than four kilometres in length, and use decreases after that depending on availability of cycling routes, trip lengths and seasonal conditions.

Section 4.6 of the current County Official Plan states that efforts will be made to expand the County trail system (see TMP Section 6.8).

Exhibit 2-10: Trail System

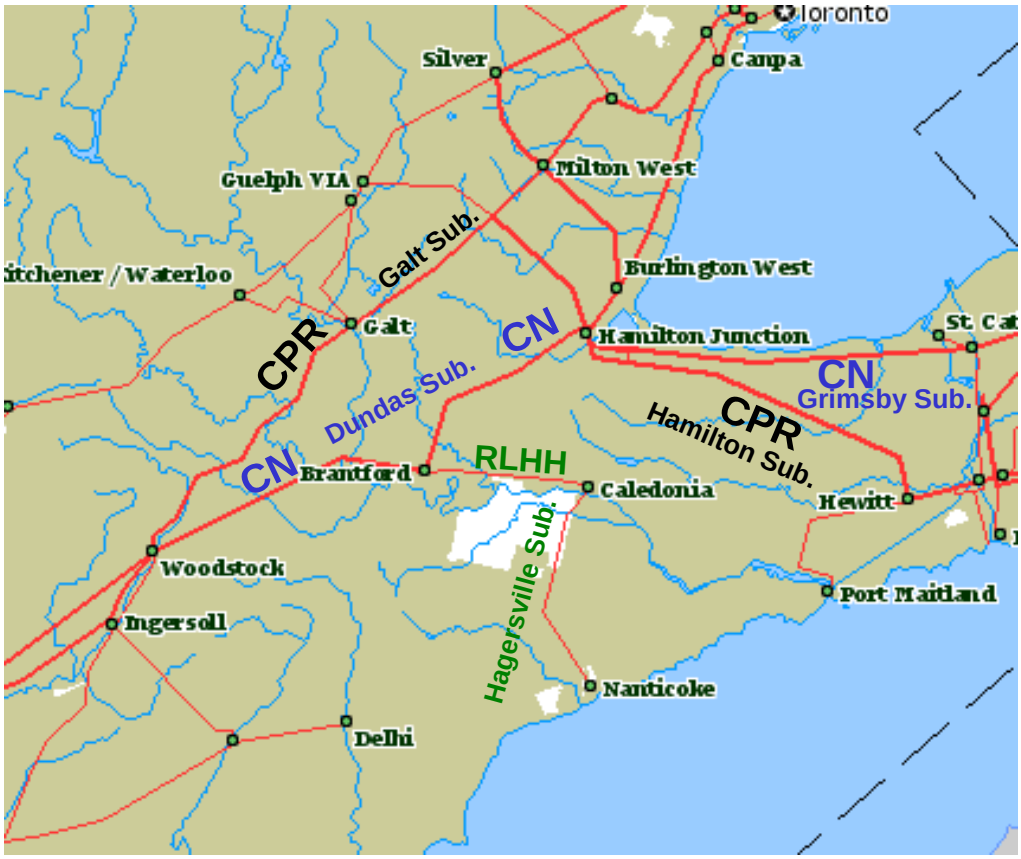


2.5 Rail Service

There are three (3) rail services currently operating in and through the County of Brant. The CN Dundas Subdivision mainline traverses the County east-west from Aldershot through Brantford and Paris to London and Windsor and on to USA transborder rail service through Detroit Michigan. As shown on Exhibit 2-11, the Grimsby Subdivision at Hamilton also links the CN mainline to the Niagara gateway transborder service at Niagara Falls. CN's Dundas Subdivision moves large volumes of industrial, resources (coal, lumber) and agricultural freight through the County of Brant. Classified as a principle mainline, the Dundas Subdivision traffic volume generally exceeds 5 trains per day at high speeds frequently exceeding 80 km/h.

Southern Ontario Railway (RLHH) is a RailAmerica company, and includes two unconnected sections. One section runs through the County of Brant from Brantford to Nanticoke. It started operation in September 1997, and has an interchange with CN at Brantford. The second unconnected branch is the Hamilton terminal portion started in December 1997. It runs for four miles accessing the Port of Hamilton and connects with both CN and CP at Hamilton. It services the industrial basin in Hamilton.

Exhibit 2-11: County of Brant Area Rail System



These two branches comprising Southern Ontario Railway provide a short line freight operation handling a broad range of commodities including petroleum products, metals, steel and plastics, chemicals, grain and forest products. As a RailAmerica company, RLHH is a former CN rail property now leased for a 21 year term to RailAmerica commencing in 1997. This railway line runs through the County of Brant connecting externally with Brantford, Caledonia, Hagersville, Onongada and Nanticoke. As a branch or short line operation, RLHH carries generally less than 5 trains per day at slower speeds generally limited to 50 km/h.

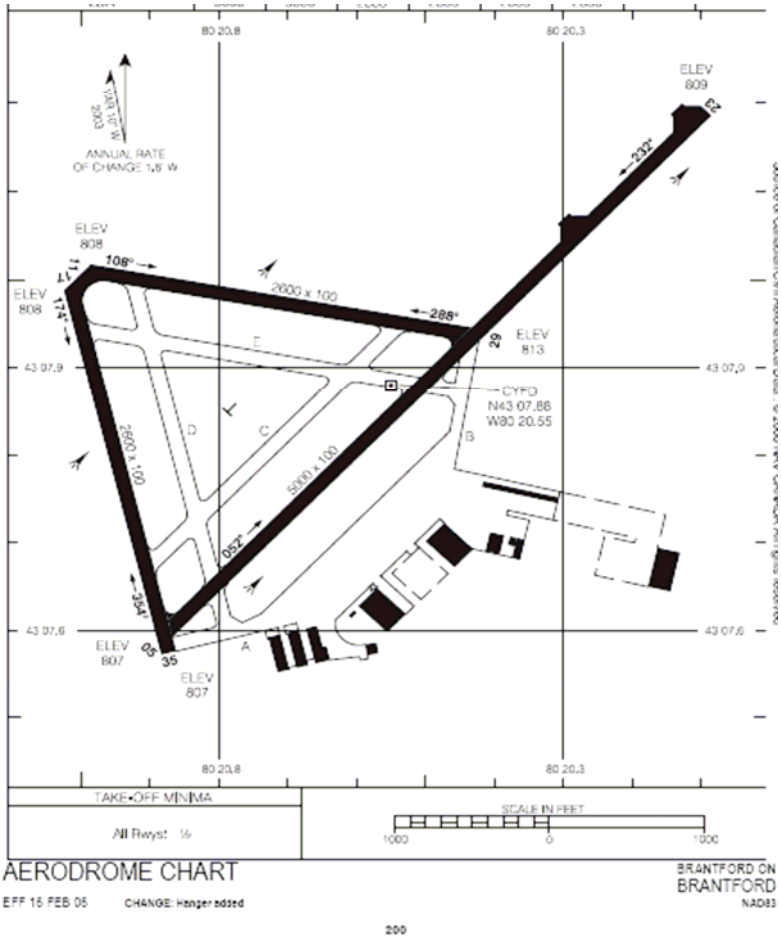
The third rail service through the County of Brant is the VIA passenger service operating on the CN Dundas Subdivision. VIA operates four (4) trains east and west through Brantford daily connecting on the Quebec City-Windsor corridor to Toronto Union Station and points east, and Woodstock, London and Windsor westbound. The closest station for County of Brant residents is the Brantford Station in the City of Brantford.



2.6 Aviation Service

The primary source of aviation service in the County of Brant is provided by the Brantford Municipal Airport, located 7.4 km west southwest of the City of Brantford. The airport is owned by the City of Brantford, with the Brantford Flight Centre being the fixed base operator (FBO) of the airport, which is run by the Brantford Flying Club. The Airport opened in 1940 as one of the Commonwealth Air Training bases. It presently has three asphalt runways as shown on Exhibit 2-12 from the Canada Flight Supplement.

Exhibit 2-12: Brantford Municipal Airport



Runway 05/23 is 1,524 m x 30.5 m and the other two runways are 792 m x 30.5 m. The airport is equipped with runway lighting and a GPS (Global Positioning System) approach to accommodate night flying. It is also a certified CANPASS airport of entry that accommodates domestic and international passenger and cargo aircraft including corporate, recreation and charter fights, plus flight training and aircraft maintenance services.

For transborder and international flights, the existing Canada Border Service Agency staff at the airport can currently handle general aviation aircraft only, with no more than 15 passengers.[11] Other than this staffing limitation, the airport offers a range of aviation-related services and opportunities for the business community and recreation flyers. This includes leasing and development opportunities on site for both aviation and non-aviation related industries. Commercial and warehouse space is also available for long and short-term lease through the City of Brantford Property Management Department.

In January 2008, Brantford City Council directed the inclusion of $1.9 million in planned Airport Infrastructure upgrades for fiscal 2008, including repaving of the main runway typically used by corporate aircraft, plus a second runway.

The role of the Brantford Municipal Airport in the County of Brant transportation system is limited to the service to corporate and recreational aircraft. While it has a very minor role in the movement of

[11] Canada Flight Supplement

people and goods across the County, and essentially no role in reducing auto demands, it is still an important transportation service for the continued economic development and vitality of both the County of Brant and City of Brantford. As a result, planning policies and decisions for land use in the vicinity of the airport must continue to protect the safe operational capability of the airport in terms of off–airport land zoning (i.e. building height, material), land uses which are compatible with the airport's noise exposure forecasts (NEFs) and links to the County and City roadway networks. Federal airport protection standards must continue to be followed to ensure that the airport can operate without any off-airport restriction.[12]

[12] Aerodrome Standards and Recommended Practices, Air Navigation System Requirements Branch, Transport Canada, revised 03/2005

3. PUBLIC CONSULTATION

3.1 Consultation Process

The public consultation process employed for the County of Brant Transportation Master Plan (CBTMP) began with a notice to agencies and stakeholders mailed in late September 2006, and a Notice of Study Commencement posted in six Brant County newspapers in early November 2006. A project web site was also set up on the County's web site at that time. Copies of this initial consultation material are included in **Appendix 1** of this document, along with the initial record of agency and stakeholder input.

The consultation process also included four Public Information Centres (PIC) held in early 2007. Other consultation events held for the project included a goods movement stakeholder workshop on June 29, 2007, and Working Group (see Section 1.7) meeting on April 18, 2008, response to public questions and comments, and a public review period to review and comment on the draft CBTMP. All public input to the project and associated responses are included in the project record.

The series of PICs provided the widest and most effective opportunity for public input into the project. The following four PICs were held to review and receive input from the public, collect background information and identify key transportation issues in the County:

PIC #1: Thursday, February 8, 2007, Burford Arena

PIC #2: Thursday, February 15, Paris District High School

PIC #3: Thursday, March 1, 2007, Cainsville Community Centre

PIC #4: Owing to poor weather conditions on March 1st, a second Cainsville PIC was added at the Cainsville Community Centre on Monday, March 26, 2007.

The format for each PIC was similar, with an informal drop-in open house beginning at 4:30 p.m. Exhibits were placed on display on both the Transportation Master Plan and Official Plan Review. Consultants and staff involved in each project were on hand during the open house until 8:30 p.m. to discuss the project information, answer questions and take notes and request the completion of comment forms on any input provided by the attendees.

Additional consultation was conducted during the TMP preparation with MTO, special stakeholders such as trucking company representatives and the Working Group with membership from the County, City of Brantford and Six Nations to advise on strategic directions for the TMP.

The Draft CBTMP dated June 17, 2008 was presented at a special meeting of County Council on June 25, 2008. It was advertised in four (4) area newspapers, and with notices sent to those on the project mailing list. Comments and questions were heard from the attendees, including:

- Need to improve the Bishopsgate Rd./Puttown Rd. route if designated as a Paris west bypass route;
- Whether an east bypass route around Paris is feasible;
- The cost of public transit investment in the County compared to more road widenings;
- The impact of a Paris truck bypass on downtown Paris business;

- The need for safe on-road cycling in the County;
- The need for a public transit service between Paris and Brantford, and between Brantford and Cambridge; and
- What alternatives are available for a new highway between Brantford and Cambridge.

A summary of public input from the PICs is presented in the following section. The PICs generated only five (5) written comment forms, which is a relatively low number. However, participants also provided a good source of verbal comments at the meetings. These comments suggest that the following should be prioritized as being public issues relating to transportation in Brant County.

3.2 Key Transportation Issues Presented by the Public

At the project commencement, the Project Team identified a number of transportation issues facing the County of Brant that were presented at the PICs. Attendees at these PICs reiterated some of these issues, and provided additional input on issues as summarized in this section. Based on the frequency of comments on particular issues, the following are considered to be the priority of key transportation issues presented by the public:

1. **Paris area traffic** growth and conditions, including volumes, speeds, noise, turning movements especially relating to truck traffic;
2. Need for a **Truck Route Plan and Management** in the County of Brant, including a possible truck route bylaw;
3. **Highway 24** route planning study and Environmental Assessment between Highways 401 and 403 by MTO (not under County jurisdiction);
4. **Intersection operations** and safety at a number of identified specific intersections that are typically beyond the scope of a comprehensive municipal transportation master plan to address. In some cases where turning movement data was available, such as at the intersection of Brant County Road #18 and Blossom Avenue, and Mount Pleasant Road and Phelps Road, the Project Team did review intersection Level-of-Service but no volume/capacity deficiencies were identified;
5. **New Highway 403 interchange** in the Paris/Falkland area to meet existing and future County growth needs;
6. Need for a new linkage of **Brant-Oxford Road/Puttown Road/Bishopsgate Road** with Highway 403 (related to Issue #5);
7. Impact of **Brantford growth** on traffic volumes on peripheral County roads such as Pleasant Ridge Road, Brant County Road #18 and Powerline Road; and
8. **Innovative transit service** to the Paris and Cainsville areas.

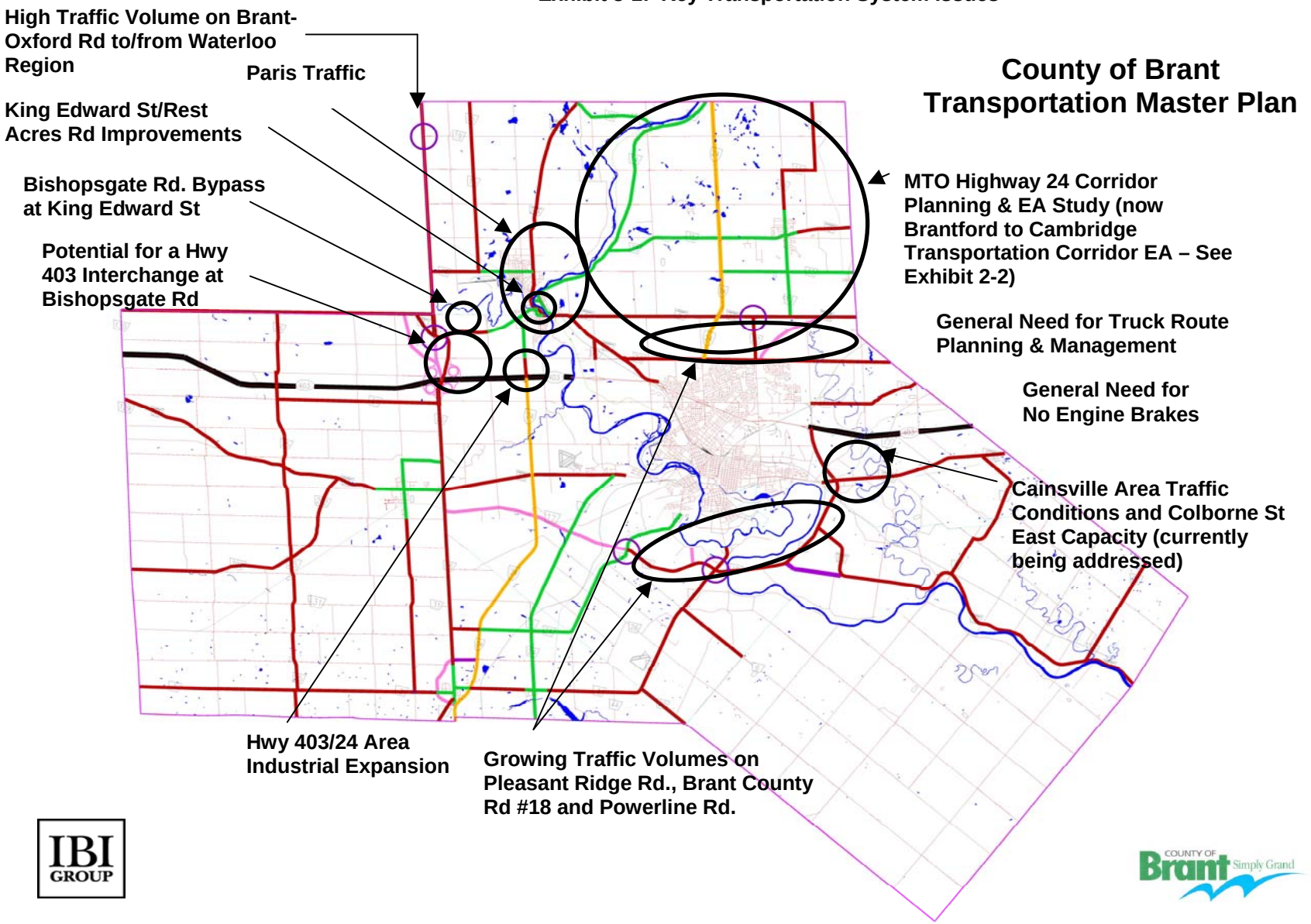
These and other key transportation issues facing the County of Brant are identified on Exhibit 3-1.

3.2.1 SPECIFIC PUBLIC COMMENTS

Note: The following is a summary of specific comments provided by the public at PICs, and does not originate from the Project Team. A number of very specific comments were also offered dealing with individual intersection operations in the County. Most have not been addressed by the CBTMP owing to the County-wide strategic scope of this project, but have been filed in the project record (see **PUBLIC CONSULTATION REPORT: Summary of Public & Agency Input Public Information Centre Series** dated May 7, 2007).

- Many seniors have mobility problems, and it would be helpful to have improved community transit, potentially for a dial-a-ride type service.
- Intersection safety is a concern in the area west of Paris in the Falkland area on Governors Road West at County Highway 2 and Brant-Oxford Road, County Highway 2 at Puttown Road and King Edward Street at Bishopsgate Road.
- County of Brant's transportation system generally works well with no major problems.
- Of the two possible locations for a new interchange on Highway 403 at either Bishopsgate Road or Maple Avenue North, Bishopsgate makes the most sense because it provides a continuous north-south connection, while Maple Avenue North is discontinuous north of Highway 403.
- Increasing truck traffic on Bishopsgate Road north of the 403 is a concern. This traffic is generated by some trucking firms located in this area, but Bishopsgate Road also appears to be a diversion route if there are problems on Highway 403.
- Concerns that any new or upgraded Highway 24 will be expanded to a 400 series highway in the future.
- Powerline Road along the north boundary of Brantford is increasingly being used by pedestrians and cyclists, yet there are almost no shoulders on this road. This will increase if residential development is extended south of Paris. Trucks also use Cleaver Road and Powerline Road, so there may be a potential future conflict with residential development.
- CN rail traffic volume and train lengths have grown particularly in the Cainsville area.
- East River Road should be considered as a potential Paris bypass route.
- Extend the existing Cambridge-to-Paris rail-to-trail route south into the Paris downtown.
- Extend Bishopsgate Road north of King Edward Street to connect with Brant-Oxford Road.

Exhibit 3-1: Key Transportation System Issues



- There is too much truck traffic in downtown Paris. Other Paris transportation issues include:
    - All the trees on the main street in Paris were cut down. Can new trees be planted?
    - The parking layout on the Paris main street works well but requires people to stop and let people out. The stores need the parking to encourage customers.
    - Main Street parking in downtown Paris should become residential parking in the evening to encourage multi-use buildings with residential above stores.
    - In order for residential units to be feasible above the stores in downtown Paris, the truck traffic needs to be dealt with.
- Connect the Cainsville area to Highway 24 via an extension of Brant County Road #18 around the east side of Brantford.
- Concern that an extension of the BSAR (Brantford Southern Access Route, since renamed the Veterans Memorial Parkway) in Brantford will increase traffic on Pleasant Ridge Road.
- Does the County need new guidelines for the location of 4-way stops?
- Potential need for rural traffic calming by checking with the OPP on rural hot spots in the County.
- Consultants should review the County's existing haul road map as part of considering truck route bylaw.
- County needs an alternative truck route plan with associated signage information.
- Review posted speeds on County roads as posted 80 km/h is usually exceeded.
- Pedestrian safety along County roads especially at night with no illumination and high traffic speeds i.e. Old Onondaga Road East.
- Farm machinery movement is an issue on County roads that split the same farming operation. Question of whether Farm Machinery signage would help. Traffic on County roads (i.e. Blossom Ave) is making it difficult for farmers who need to drive equipment on these roads. There are growing conflicts with traffic.
- The volume of commuter traffic going north on Highway 24A in the morning is growing.
- The study should look at opportunities for transit. These may need to be innovative and customized transit services.
- Better connections to Cambridge are required. A Cambridge By-pass has been identified by the Region of Waterloo and this should help.
- Noise of trucks on County roads is a growing concern. More signage of "No Use of Air Brakes" would help.
- Truck traffic is growing on Brant-Oxford Road.

3.2.2 MINISTRY OF TRANSPORTATION INPUT

MTO has provided input to the CBTMP and the new Official Plan regarding:

- Control of County road and intersection improvements within MTO permit control areas.
- General support for a new Highway 403/Bishopsgate Road interchange, at County cost since MTO has not identified such a project as a provincial need.
- Highway 403/Highway 24 Area Industrial Expansion and MTO's access management best practices.
- The Highway 24 Transportation Corridor Planning and Class EA Study generated considerable interest by County residents in 2006 and 2007. On June 10, 2008, MTO announced that the most effective way to respond to comments and questions received as part of this process was to change the project direction, and proceed now with the study as an Individual EA(see Section 2.1.1). This continuing MTO initiative provides limited opportunities to reflect its findings in the CBTMP based on study completion schedules. A preferred new highway alignment is not expected to be public until late 2009.
- Requirement to consider MTO interests and input in any planning of traffic improvements in the Paris area, including bypass planning.
- MTO provided final comments on the CBTMP in their letter of November 3, 2008, and these requested edits were made in this Final Report.

4. STRATEGIC TRANSPORTATION ALTERNATIVES FOR THE COUNTY

4.1 Environmental Planning Approach

In order to conform to the Municipal Class Environmental Assessment environmental planning process, the following key principles of successful environmental assessment planning must be followed in preparing this CBTMP:[13]

- Consult with affected parties throughout the plan development so concerns and needs can be identified and addressed within the scope of a master plan;
- Consider a reasonable range of strategic transportation planning alternatives in developing the master plan, both structural and non-structural to address the County's overall transportation needs. This includes consideration of the Do Nothing or Status Quo planning alternative;
- Identify and consider the general effects of any structural alternatives, at a strategic level, on all aspects of the environment, namely the impacts on the natural, social, cultural, technical and economic environment;
- Systematically evaluate any structural planning alternatives in terms of their general advantages and disadvantages to determine their net environmental effects. Consideration should be given to changing conditions over time in order to produce a dynamic plan that is capable of change;
- Provide clear and complete documentation of the planning process to allow "traceability" in the decision-making process that eventually recommends the transportation master plan.

It is important to again stress that while this CBTMP has been prepared using these environmental planning principles, it does not constitute an Environmental Assessment under the EA Act. Schedule C transportation undertakings in the County must still undergo the complete Schedule C EA process, but this CBTMP will form Phases 1 and 2 of the process dealing with problem identification and evaluation of alternative planning solutions respectively. Also, the CBTMP cannot be the subject of a Part II Order appeal.

Also, any works in the County that impact a Provincial Highway will need to conform to the Provincial Class Environmental Assessment for Transportation.

4.2 Strategic Transportation Alternatives

4.2.1 IDENTIFICATION OF STRATEGIC PLANNING ALTERNATIVES

The consideration of functionally different planning solutions or "alternatives" is an essential part of the EA process. In parallel with the evaluation of growth options considered in the new Official Plan (see Section 5), three broad transportation planning strategies for the County were examined in terms of their potential to address the County's transportation needs while respecting the goal and objectives of this plan outlined in Section 1.4, namely:

[13] Municipal Class Environmental Assessment, Municipal Engineers Association, June 2007

- **Status Quo** - No major structural changes would be made to the road network under County jurisdiction, or other transportation infrastructure and services provided by the County. The County would focus on road and trail maintenance, and monitoring the warrants for traffic control and localized intersection improvements on an as-required basis within the existing roadway network. In this strategic alternative, no action would be taken to make significant capacity enhancements within the road network and on any specific corridors. This is considered the most conservative approach to transportation system planning for the County.

- **Enhanced Basic Mobility –** In this strategic alternative, those transportation projects already planned or underway by the County would be completed, as well as roadway capacity enhancements where required to serve new development through strategic road widenings and extensions. It also includes roadway capacity optimization through localized intersection improvements where warranted, and access management where warranted along major corridors (i.e. improved signal coordination, turn restrictions).

- **Towards Sustainability** – This strategic alternative would not only enhance basic mobility through roadway network capacity expansion as in the previous alternative, but would also move to further expansion of active transportation infrastructure (trails, on-road bikeways) and introduction of selective transit service in the County. This would also include use of demand management programs appropriate for the County of Brant to encourage use of these alternatives to the private automobile.

4.2.2 EVALUATION OF STRATEGIC ALTERNATIVES AND PREFERRED TRANSPORTATION STRATEGY

Each strategic transportation alternative was evaluated based on four broad categories relating to the EA principles outlined in Section 4.1. The evaluation was largely based on a subjective evaluation, drawing on existing transportation conditions in the County and input from the public and stakeholders summarized in Section 3, as well as transportation planning experience. Considerations under each of the four categories, or factors, are listed below.

1. Natural Environment Factors

- Reduction in Air Contaminants (i.e. CO emissions from vehicles)
- Minimizes noise impacts on sensitive areas
- Protect water quality, natural areas, flora and fauna, etc.

2. Socio-cultural Factors

- Improve quality of life in neighbourhoods
- Reduce collisions; improves personal safety and security
- Improve travel mode choice

3. Economic Factors

- Attract and retain employment, capital, optimal use of transportation infrastructure capacity, and future land use
- Maintain/enhance property value (does not decrease property values)

- Reduce or defer public and private costs of transportation capital (construction or acquisition of fixed infrastructure) and operations (maintenance, enforcement, delay, fuel, etc.)
- Capital cost to implement

4. Technical Factors

- Maintain traffic flow at acceptable Level-of-Service
- Ease of implementation
- Minimize operational impacts

Exhibit 4-1 provides a summary of the evaluation of strategic transportation alternatives and the key considerations made in this evaluation. The preferred overall strategy is to rely on **enhanced basic mobility** to achieve improved roadway and active transportation conditions where required, while moving towards more **transportation sustainability** within the context of the County of Brant through the introduction of other transportation services in association with roadway capacity optimization and travel demand management where required over the next 20 years.

This preferred strategic approach, represented by the **Towards Sustainability** planning strategy, will solve transportation problems and minimize the need for further road expansion. At the same time, it is also recognized that adequate road infrastructure is essential for the County's economic development, especially within rural and employment areas, and that this preferred strategy must reflect a balanced transportation network. Specific strategies also vary by individual location in the County as described further in Section 6.

Exhibit 4-1: Evaluation of Strategic Transportation Alternatives

Evaluation Criteria	Status Quo	Enhanced Basic Mobility	Towards Sustainability
DESCRIPTION	- No major changes to the road and active transportation networks	- Complete planned capacity enhancement projects plus further capacity enhancements, optimization and access management where warranted	- Enhanced Mobility alternative with more active transportation, selective transit service and travel demand management programs over the long term in the County
NATURAL ENVIRONMENT FACTORS	- No natural area impact due to construction and operation - Increased traffic congestion and related air emissions and fuel consumption	- Localized impacts due to selective road widenings - May increase auto use due to enhanced roadway mobility	- Move towards reduced air emissions - Reduce localized road network congestion where applied, with less fuel consumption
SOCIO-CULTURAL FACTORS	- Would result in constrained social activity due to traffic congestion and travel delays on key corridors	- Current committed transportation projects and further capacity enhancements will address future travel demand, but will not significantly improve transportation choice in the County	- Requires major behavioural changes over the long term - Capacity optimization has few impacts on travel patterns - Promotes non-auto oriented lifestyle - May require property acquisition
ECONOMIC FACTORS	- Travel delays will be created by congestion - Likely to detract new development in selective areas of the County owing to transportation travel congestion and related travel time delays	- County's committed project can address problems within planned capital budgets - Enhanced Mobility projects and initiative do not account for other active transportation, transit and travel demand management opportunities	- Travel demand management initiatives require County costs plus those of the private sector (employers) - Cost for transit service
TECHNICAL FACTORS	- Traffic operational deficiencies and related safety and Level-of-Service problems will increase with planned County growth	- Committed transportation network capacity enhancements are technically feasible, with no major technical impacts	- Requires extensive staff resources from the County to monitor and manage a multi-modal transportation system
OVERALL ASSESSMENT	**NOT RECOMMENDED**	**RECOMMENDED AS BASIC REQUIREMENT**	**RECOMMENDED AS PREFERRED STRATEGY**

5. FUTURE TRANSPORTATION NEEDS ASSESSMENT

Most of the transportation system needs in the County of Brant will evolve in direct response to the amount, type and form of population and employment growth in the County. The County's transportation system will also continue to be affected by growth and traffic patterns in the City of Brantford, as well as from neighbouring municipalities. As noted in Section 2.1.2, roadway travel patterns in the County are generally dispersed, with Brantford as the largest destination with multiple roadway routes in and out of the City. Other major destinations are Cambridge and Kitchener-Waterloo to the north and Hamilton to the east. For traffic commuting to the County, it also arrives from all directions including Brantford, with Haldimand, Norfolk and Oxford Counties being large sources of commuters.

However, it is growth in the County itself over the next 25 years, and specifically in the Paris-Brantford area that is expected to generate the most related County transportation needs for all modes of transportation. Fortunately, this TMP was prepared in association with the County's new Official Plan, which provided the growth forecasts, locations and types required to forecast associated travel demands. The County's growth plans were taken from the following key documents:

- County of Brant Official Plan Review: Growth Strategy & Policy Direction Report Draft, MMM Group, April 14, 2008
- Brant County Official Plan Review: Growth Analysis Study 2006-2031, Watson & Associates, March 20, 2008

5.1 Population Growth

Growth in the County of Brant is now directed by The Growth Plan for the Greater Golden Horseshoe (GGH), prepared under the *Places to Grow Act*, *2005*. The Growth Plan outlines how and where growth should be accommodated, as well as how much growth is targeted for each community within the GGH. The targets provided in the Growth Plan outline the Province's intent as it relates to population and employment growth for the County of Brant. The determination of local area projections, or settlement area projections in the case of the County, were made by the County to identify intended growth within the County's settlement areas, hamlets, and rural area.

The projections identified in the Growth Plan indicate that the County of Brant is to benefit from modest growth of approximately 4,000 persons and approximately 1,000 jobs between the years of 2001 and 2011. After 2011, the projections for the County of Brant and the City of Brantford have been combined into one overall target. It appears that the County and City combined are anticipated to increase by approximately 16,000 persons and 4,000 jobs between the years of 2011 and 2031.

The Growth Analysis Study conducted by Watson & Associates differentiates the County portion of the combined growth between 2011 and 2031 as shown on Exhibit 5-1. Using 2006 as the baseline with a County population of 38,400 according to the 2001 census, the County is expected to experience relatively modest population growth in the County of 2,100 new residents by 2011, 6,100 by 2021 and 11,700 by 2031.

The TMP is interested in the transportation impacts of these additional 11,700 residents in the County by 2031, with these impacts dependent on the location of new housing development. This was forecast by Watson & Associates based on the location of new housing units by settlement area as shown in Exhibit 5-2.

Exhibit 5-1: County Growth Forecasts 2001 - 2003

Population and Employment Projection Comparison for Brant County 2001-2031								
	Population				Employment			
	2001	2011	2021	2031	2001	2011	2021	2031
County of Brant*	35,000	39,000	157,000	173,000	16,000	17,000	67,000	71,000
City of Brantford*	94,000	102,000			39,000	45,000		
County of Brant**	34,800	40,500	44,500	50,100	16,000	19,000	22,000	25,000

* Targets indicated in Growth Plan for the GGH

** Forecasts conducted by Watson and Associates and calculated from mid 2001, mid 2011, mid 2021 and mid 2031.

Exhibit 5-2: Location of New Housing Units for Brant County Location

Growth Area	2006-2011	2011-2016	2016- 2021	2021-2026	2026-2031	Total Housing Units
Fully-Serviced						
Paris (existing built boundary)	100	50	75	75	75	375
SW Paris	260	800	750	850	850	3,510
Remaining Paris	0	0	0	0	0	0
St. George	65	0	0	0	0	65
Cainsville	0	0	0	0	0	0
Partially Serviced						
Oakhill	25	10	10	10	10	65
Mt. Pleasant/Tutela Heights	60	20	20	20	20	140
SW Paris	5	0	0	0	0	5
No-Services	375	145	120	120	120	880
Total	**890**	**1,025**	**975**	**1,075**	**1,075**	**5,040**

Source: Watson & Associates Economists Ltd. 2008

The important conclusion from these population forecasts is that the vast majority (70%) of population growth in the County of Brant is expected to be located in the SW Paris settlement area. This growth allocation is summarized in Exhibit 5-3.

Exhibit 5-3: Distribution of Annual Housing Growth

Growth Area	2006-2011	2011-2016	2016-2021	2021-2026	2026-2031	Annual Average (2006-2031)	Percent of Growth
Fully-Serviced							
Remaining Paris & Existing Built Boundary	20	10	15	15	15	15	7%
Southwest Paris	52	160	150	170	170	140	70%
St. George	13	0	0	0	0	3	1%
Partially Serviced							
Oakhill	5	2	2	2	2	3	1%
Mt. Pleasant/Tutela Heights	12	4	4	4	4	6	3%
Southwest Paris	1	0	0	0	0	0	0%
No Services	75	29	24	24	24	35	17%
Total Annual	**178**	**205**	**195**	**215**	**215**	**202**	**100%**

Source: Watson & Associates Economists Ltd. 2008

Note: Forecast housing unit mix is 73% low-density, 19% medium-density, and 8% high-density.

5.2 Employment Growth

The amount and location of employment growth will also impact transportation needs in the County based on predominant home-work trip patterns. Watson & Associates forecast employment growth for the County as a whole, growing from 17,000 jobs in 2006 to 19,000 in 2011, 22,000 in 2021 and 25,000 in 2031. Similar to population growth, these 8,000 new employment positions over the next 30 years will influence transportation needs.

The County also confirmed that almost all of these new employment positions will be located in SW Paris. Watson & Associates calculated that 75% of the serviced industrial land in the County is located in SW Paris. As a result, Exhibit 5-4 shows that 75% or 6,000 new jobs will be located in SW Paris by 2031.

Exhibit 5-4: Employment Growth Forecasts

Year	Jobs	Growth from Baseline	SW Paris
2006	17,000	Baseline	-
2011	19,000	2,000	1,500
2021	22,000	5,000	3,750
2031	25,000	8,000	6,000

5.3 Travel Demand Growth

Roadway travel demand generated by this population and employment growth was manually calculated based on standard peak hour trip-making factors developed by the Institute of Transportation Engineers (ITE) for numerous land uses and building types. This is part of the following conventional three-stage trip generation process used in this TMP to estimate transportation needs within the County:

1. **Trip Generation** – This is based on ITE trip generation rates for specific land uses such as 0.21 trip in and 0.62 trip out of a low density residential unit in the morning peak hour, primarily as the go-to-work trip. The detailed trip generation table developed for the residential growth areas of the County is included in **Appendix 2** of this TMP.

2. **Trip Distribution** – This deals with where the trips go that are generated, in general directions to municipal destinations based on the available road network and established travel patterns. The regional distribution of travel to and from the County was present on Exhibits 2.2 and 2.3 based on 2001 Census Place of Work data. These patterns have been applied to the future trip distribution, resulting in the future trip table and 2031 trip distribution maps to and from the SW Paris area shown in **Appendix 2**.

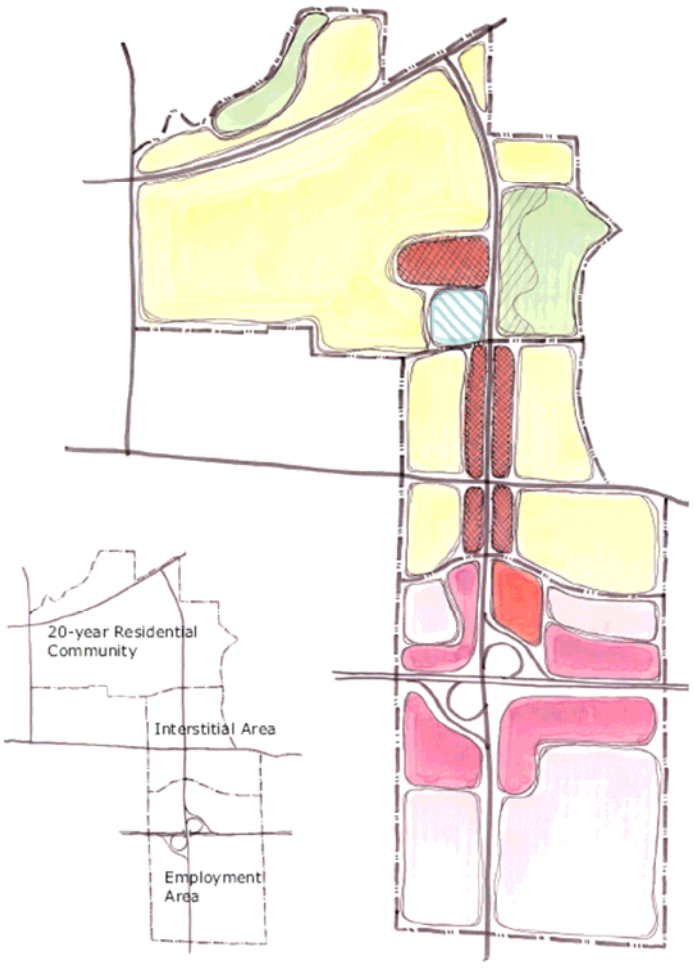
3. **Mode Choice** – Presently the mode choice for trips in the County generally more that 4 km in length is the private automobile or ride-sharing. With no transit service in the County, there is no mode share to transit. The amount of inter-municipal bus service use for example to Brantford and Hamilton is extremely small. Cycling and walking trips generally serve short trips, and therefore have limited mode share potential over longer distances. However, the fact that the SW Paris urban development area is planned for a mix of both residential and employment components represents an example of a development area in the County with a wider mode choice potential.

The other serviced growth areas of the County identified in the Watson & Associates study, namely the remainder of the existing Paris settlement, St. George and Cainsville, as well as unserviced portions of the Oakhill, Mount Pleasant/Tutela Heights and SW Paris areas are assigned very low levels of growth that do not generate levels of trip generation significant enough to forecast for County-wide strategic planning purpose. As a result, they are not expected to impact Level-of-Service on the existing or future road network.

New travel demands that are generated by these growth areas over the long term to 2031 can also be expected to be offset by Transportation Demand management initiatives in the County that form part of the **Towards Sustainability** strategic direction recommended in Section 4.2. Also, the 17% of housing growth forecast in unserviced rural areas will distribute travel across the extensive network of County roads, also with no expected impact on roadway Level-of-Service.

Exhibit 5-5: SW Paris Urban Expansion Area Plan

As a result of this focus on SW Paris for housing and employment growth in the County, the focus of future trip generation and associated transportation system needs is also focused geographically on the SW Paris urban expansion area, as discussed further in Section 5.4 and shown here on Exhibit 5-5.



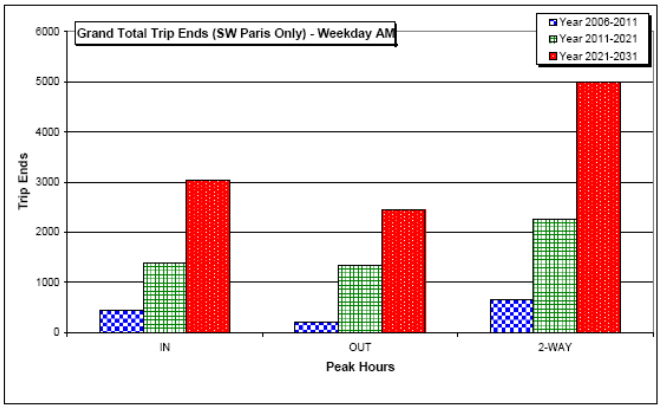
(top) A Preferred Plan for the Urban Expansion Area

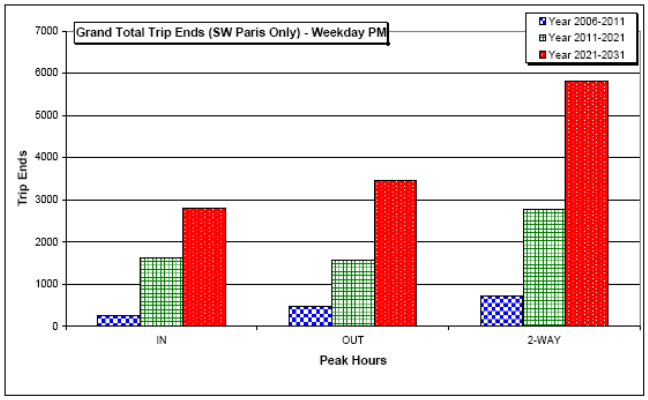
The trip generation resulting from these growth forecasts across the entire County is tabulated in **Appendix 2** and summarized on Exhibit 5.6. The amount, type and location of forecasted growth in the County is expected to ultimately generate some 9,400 additional trips in the AM peak hour and 11,235 in the PM peak hour spread across the entire County road network.

Of this, 5,000 more AM peak hour trip and 5,800 more PM peak hour trips will ultimately be generated by the SW Paris urban expansion area by 2031. The generation from SW Paris only is shown graphically on Exhibit 5-6.

Exhibit 5-6: Summary of New Trip Generation (rounded)

By Year	2-Way AM Trips	2-Way PM Trips
TOTAL COUNTY		
2011	1,125	1,325
2021	3,855	4,695
2031	9,420	11,235
SW PARIS ONLY		
2011	655	725
2021	2,260	2,770
2031	5,000	5,815



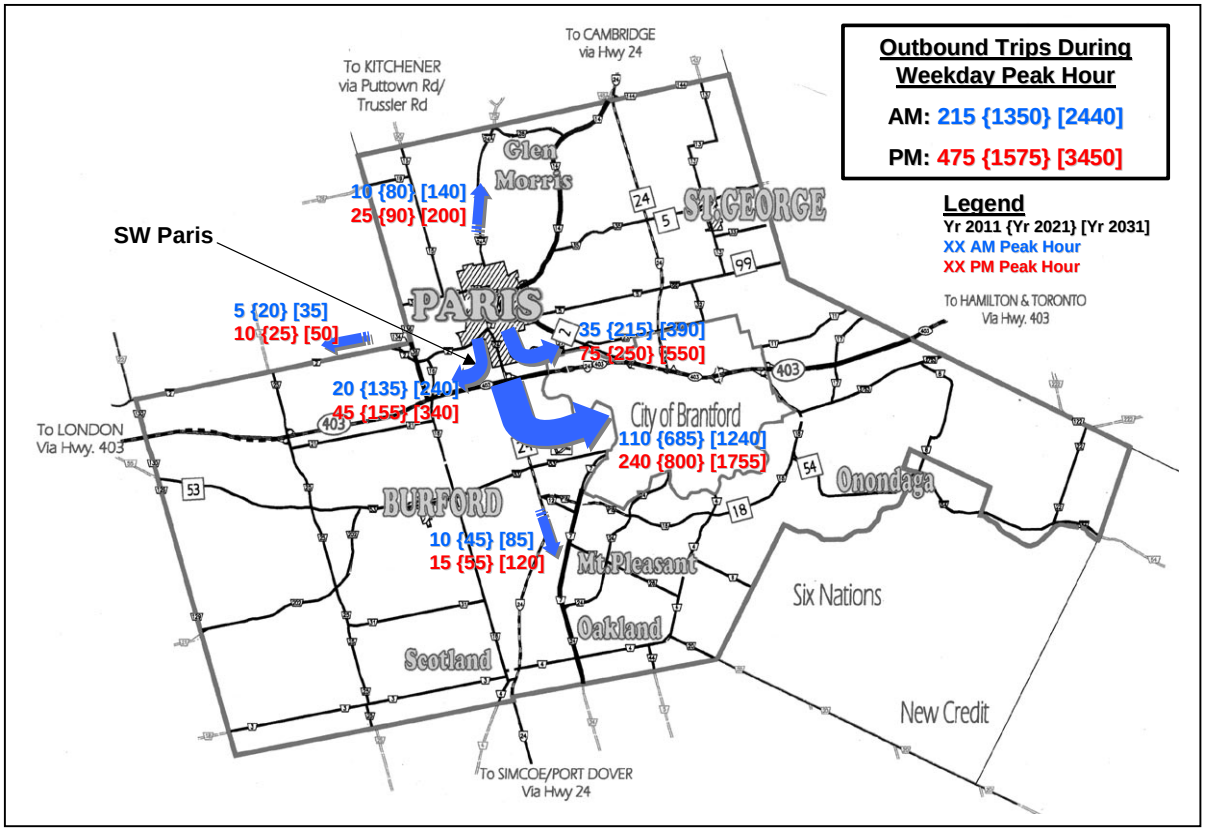


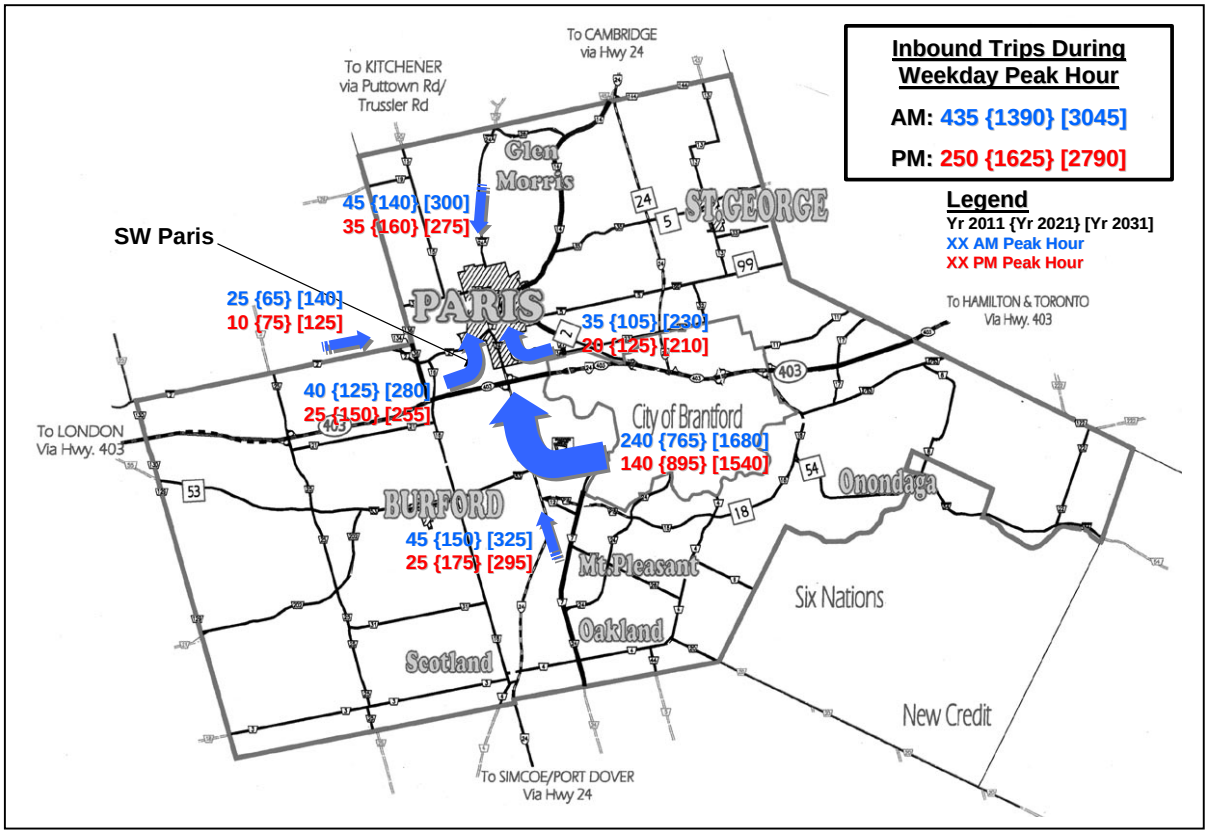
The forecasted distribution of the SW Paris traffic generation resulting from population and employment growth is shown on Exhibit 5-7 for trips originating from SW Paris in the morning and afternoon peak hours, and trips destined to SW Paris in those peak hours. Note that trip distribution on Exhibit 5-7 is only on primary highway and arterial routes. Some minor trip generation would be expected on collector and local roads but volumes are expected to be low. As a result, the trip generation numbers on Exhibit 5-7 are not intended to match those on Exhibit 5-6 and in Appendix 2 for the SW Paris area.

The trip generation and distribution volumes on Exhibit 5-7 shows that SW Paris growth can be accommodated by the existing road network at least to 2011. However, by 2021 the peak hour trip volumes to and from Brantford (685) will begin to approach the need for one additional travel lane per direction. This is expected to grow to a need for two added travel lanes per direction by 2031 based on a planning capacity for arterial roads of 800 vehicle/lane/hour (see Section 2.1.3).

This confirms that the greatest roadway network capacity enhancement need is expected to be in the SW Paris area. The next highest traffic volumes will be to and from SW Paris to the east, but these will be served by sufficient Highway 403 capacity. It is expected that the remainder of the traffic distribution forecast to and from SW Paris will be accommodated by the existing County and highway road networks.

Exhibit 5-7: Trips Originating from and Destined to SW Paris 2011 – 2031





5.4 Alternative Roadway Network Improvements

The analysis of new growth patterns and associated trip generation conducted for the TMP, based on information provided from the Official Plan review, has provided an opportunity to review and update past road network enhancement recommendations found in the existing Official Plan, Schedule C. The following conclusions have been reached in this CBTMP regarding these previous and new roadway network improvement needs:

5.4.1 PREVIOUSLY RECOMMENDED IMPROVEMENTS

1. **Intersection Improvements –** Schedule C of the current County of Brant Official Plan previously shown on Exhibit 2.1 includes five proposed intersection improvements at the following location that are re-evaluated in this TMP. Any other potential intersection improvements will be addressed by the County based on established improvement warrants described in Section 6.5.1, and are beyond the strategic scope of this TMP to identify or address:

    1. Brant-Oxford Road and Drumbo Road
    2. County Highway 2/King Edward Street and Puttown Road
    3. Park Road N. and Governors Road East
    4. Brant County Road #18 and Cockshutt Road
    5. Phelps Road and Mount Pleasant Road;

2. Planning for a new Highway 403 interchange at Bishopsgate Road;
3. Associated with the previous improvement #2 is the realignment of Bishopsgate Road west of the Puttown Road/King Edward Street intersection to intersect with County Highway 2;
4. Extension of Phelps Road from Mount Pleasant Road to Bishopsgate Road across Highway 24;
5. Construction of a west bypass of the Scotland settlement extending from Elliott Road south to Vanessa Road;
6. Construction of a short road connection between Phelps Road and Tutela Heights Road; and
7. Construction of a new road connecting Park Road North at Powerline Road with Governors Road East to the east.

Each of these previously recommended roadway network enhancement projects are addressed in Section 6.3 of this TMP in terms of whether each should continue to form part of the County's roadway network enhancement and improvement planning.

5.4.2 NEW RECOMMENDED IMPROVEMENTS

The travel demand growth presented in Section 5.3 identifies some new growth and associated roadway network needs not found in the current Official Plan. The main new roadway network challenges to be addressed in Section 6 of this TMP are:

- The need for roadway capacity enhancement of up to new 2 lanes per direction in the SW Paris area;
- The need for an effective roadway detour of downtown Paris for heavy vehicles; and
- The need to re-evaluate the need for capacity improvement and enhancement to Phelps Road/Brant County Roads #18 around the south edge of the City of Brantford based on the City's new TMP roadway network improvement plans.

5.5 Other County Transportation Needs

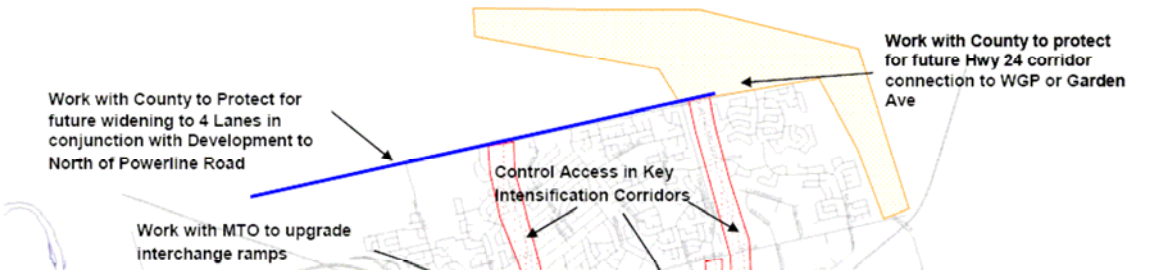
Following the recommended **Towards Sustainability** strategy, other challenges to be faced by the County over the next 20 years involve improvements to alternative modes of transportation. These are addressed in Section 6 of the TMP first involving potential transit service in the Paris area to reduce the high level of forecasted trip generation. This is followed by strategic directions for Transportation Demand Management (TDM) in appropriate locations and with appropriate methods within of the County. Part of the TDM strategy is enhancement of active transportation infrastructure and services involving cycling and walking to replace auto trips over short distances, for example in the SW Paris urban expansion area.

5.6 City of Brantford Transportation Impacts

The City of Brantford's Transportation Master Plan Update completed in late 2006 by Earth Tech Canada includes a number of transportation system recommendations that potentially impact on the County of Brant, namely:

- Consider extending Brantford Transit service to Paris (in conjunction with County);
- Protect future Highway 24 corridor connection to Wayne Gretzky Parkway or Garden Avenue (see Exhibit 5-8);

Exhibit 5-8: City of Brantford Roadway Planning Recommendations



Source: City of Brantford Transportation Plan Update, December 1, 2006

- Protect for future widening of Powerline Road to 4 lanes in conjunction with development north of Powerline Road;
- Widen the BSAR (now renamed to Veterans Memorial Parkway) to 4 lanes from Mount Pleasant Avenue to Market Street in the period 2006-2011;
- Widen Shellard Lane to 4 lanes to Conklin Road in the period 2011-2016; and
- Widen Shellard Lane to 4 lanes to the west city limits.

6. TRANSPORTATION MASTER PLAN

6.1 Master Plan Outline

A Transportation Master Plan includes a broad description of the planning framework to be used to implement future works and developments for the transportation system. This set of works is outlined as follows in response to the following elements of the County's transportation system:

- County Road Classification System
- Strategic Roadway Improvements
- Provincial Highway Improvements
- Transportation Demand Management
- Active Transportation
- Public Transit
- Goods Movement

6.2 County Road Classification System

6.2.1 NEED FOR AN EXPANDED CLASSIFICATION SYSTEM

A road classification system establishes a hierarchical structure of roadway groupings according to their physical and functional characteristics and the type of service they are intended to provide to the public. Currently, the existing County of Brant Official Plan provides a limited description of road classification elements. Benefits of implementing an expanded road classification system include:

- Established geometric design standards for consistent short and long term operational needs of all road classes;
- Established standards for functional characteristics such as land access, traffic flow thresholds, level of service (LOS), speed limits, accommodation of cyclists and pedestrians, and parking provisions;
- Improved coordination and planning of land use and transportation developments; and
- Preservation of intended service function of planned roadways and promotion of a safer environment with operational integrity.

Road classification standards must be defined such that they provide appropriate allowances for the demands of future developments rather than for just short-term requirements. In response to the County's growth plans, the proposed road classification aims to accommodate not only the future demands of motorists but also the future movements of pedestrians and cyclists through a connective environment. Although in the short run applying recommended standards may appear excessive for certain land uses (e.g. sidewalks on industrial local roads, dedicated bike lanes on rural arterials), economical and operational benefits will be realized in the long run as the adjacent lands continue to develop and demand for access increases. Maintaining a long-term vision will ensure the road

network is prepared to accommodate safe residential neighbourhoods and accessible industrial and commercial developments for all modes of travel.

6.2.2 PLANNING REFERENCE

The main sources of references for road classification in Ontario are the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads* and the Ministry of Transportation's *Geometric Design Standards for Ontario Highways*. Other classification systems adopted by Ontario municipalities have also been reviewed for reference of the current best practices. Any established road classification system has taken into consideration both the public's demand for travel and the existing and future land service function, while maintaining network connectivity and continuity. Within different classifications systems, a common component exists consisting of the following basic roadway services:

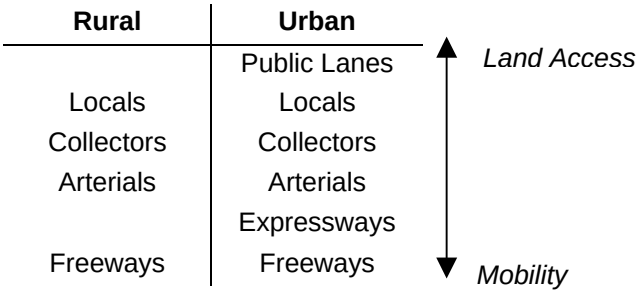
- Providing mobility by facilitating travel between points of origin and destination; and
- Providing land access.

The provision of these services is maintained throughout all road classification systems despite varying classification terminology and modifications to classification characteristics.

The Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* proposes a general structure for roadway classification with recommended standards that is the most commonly used reference for road classification. Characteristics of Rural Roads, and Characteristics of Urban Roads in the TAC manual provide the foundations of many road classification systems across the country.

Under the TAC design manual guidelines, roadways are divided into primary divisions under the classifications of "Rural" and "Urban". The terms Rural and Urban refer to the primary characteristics of adjacent land use and not necessarily jurisdictional boundaries. The primary divisions that are most commonly referenced are shown in Exhibit 6-1. The divisions are organized from "low-level" to "high-level", where the lowest level primarily provides land access to low traffic volumes without consideration to mobility and the highest-level primarily provides mobility to high traffic volumes with less consideration to access. Each division type typically connects to divisions of one level higher or one level lower. These divisions can be further subdivided to reflect the individual needs of residential, industrial, and commercial land uses.

Exhibit 6-1: TAC Design Manual Road Classification Divisions



To identify the appropriate classification for any roadway, the service function and operational characteristics need to be considered. The TAC design manual recognizes the following factors as the most important characteristics to consider when assigning a roadway classification:

- **Land Use** – Land use is an important factor when classifying roadways because of its relationship with access demands, geometric requirements, prevalent vehicular traffic, and site-specific objectives. For example, an industrial land use may service heavier vehicles and may have different geometric requirements than a residential land use. Also, residential roads may have specific objectives such as traffic calming and the promotion of cycling and walking.

- **Service Function** – All roads service traffic and land access by varying degrees of priority. For example, freeways and arterials mainly service traffic mobility, whereas local roads and public lanes almost exclusively service land access. Collectors typically provide service to both traffic mobility and land access.

- **Traffic Volume** – Road classes that mainly service traffic movement (i.e. freeways and arterials) are typically associated with high traffic volumes, whereas road classes that do not consider the movement of traffic are typically associated with low volumes (i.e. locals and public lanes). The volume range for each classification is wide and overlaps that of other classifications. It is important to note that traffic volume should not be used at the main criteria for classifying roadways because it reflects how a road is serving demand in a particular part of the network, rather than a road's role in the network. For example, a collector serving more than one arterial may experience high volumes, but this alone does not justify it being classified as an arterial. Improvements to the arterial grid capacity often alleviate escalating volumes on collectors or local roads.

- **Flow Characteristics** – The desired characteristics of traffic flow greatly impact the performance of a roadway and therefore play a major role in road classification. Uninterrupted traffic flow is expected for roadways serving traffic movement such as freeways and arterials (except at signals and crosswalks). Interrupted flow is expected for collectors and local roads where traffic movement is restricted by traffic entering, leaving and crossway the roadway, or by features such as on-street parking and traffic calming,

- **Design Speed/Running Speed** – Typically, design and running speeds increase from locals to collectors, arterials and freeways. However, to ensure a safe running speed, care must be taken to select the design speed that appropriately corresponds to the adjacent land use, service function, and speed zoning policy for the roadway. An inappropriately selected design speed (i.e. a residential collector with a design speed of 90 km/h) can encourage high running speeds and high variations in speeds between vehicles, compromising the safety of road users.

- **Vehicle Types** – The proportion of passenger cars, and heavy vehicles (trucks) served by a roadway is dependent of the purpose of that roadway. Therefore, vehicle type is related to road design and classification. Freeways and arterials are generally designed to carry a higher proportion of commercial vehicles than local and collectors which typically service passenger cars and small trucks. However, allowances can be made within the classification subgroups for the operational needs of vehicle types accessing industrial and/or commercial areas.

- **Connections** – Ideally, public lanes and local streets connect with collectors, collectors connect with arterials, and arterials connect with freeways. Maintaining such connectivity increases consistency within a road network and facilitates short and long term planning.

In addition to these key factors, the TAC design manual also includes provisions for the following:

- Transit Service;
- Accommodation of Cyclists;
- Accommodation of Pedestrians;
- Parking;
- Minimum Intersection spacing; and
- Right-of-way width.

6.2.3 ROAD CLASSIFICATION SYSTEM

The existing road classification system of the County of Brant offers limited guidance for the design, operation and maintenance of roads in rural areas compared to urban areas. Considering the current and planned patterns of land use and development in the County, a new classification structure is proposed that includes:

- Rural and Urban designations;
- Rural road classes that are consistent with existing County standards;
- Urban road classes of arterials, collectors, locals and public lanes;
- Residential and Industrial sub-classes for Urban roads;
- A comprehensive set of classification characteristics.

An expanded road classification system for the County of Brant has been developed, satisfying the above-mentioned recommendations. The proposed road classification policies for the County are primarily based on the core classification structures outlined in the TAC design manual. The classification structure of arterials, collectors and locals, as proposed by TAC, is recommended for urban areas within the County to provide a comprehensive roadway framework for future urban development, especially in the Paris and St. George areas. However, this more detailed classification structure is not warranted for rural areas where the County's existing Arterial and Collector classifications can continue to be used so that continuity in design and functionality is maintained in rural areas.

Introducing separate classifications for urban and rural roads is recommended because roads in rural settings are characterized by factors that make their operational characteristics, design requirements and associated impacts different from roads in urban areas, as summarized on Exhibit 6-2. The term "Rural" refers only to the predominant characteristics of adjacent land use along roads, and as indicated in the Exhibit, rural roads have fundamentally different characteristics than urban roads regarding density and type of land use, density of street and roadway network, natural of travel patterns and the way in which these elements are related.

More specifically, land use is the most important factor dictating rural road standards. The intensity of access needs change in rural settings, with associated roadway geometric requirements dictated by the agricultural, residential, industrial or commercial areas being served. For example, roads in rural residential areas, serving individual farmsteads up to rural estate subdivisions, are designed to

achieve many objectives other than serving passenger car residential traffic, including accommodating agricultural and industrial (i.e. aggregate extraction) traffic. Unlike roads in urban settlements that serve specific arterial/collector/local functions, rural roads are more multi-purpose, and so geometric design standards for rural roads tend to be more "generous" than in the more strictly controlled urban areas. Rural roads also tend to serve vehicular traffic only, with little if any dedicated facilities for pedestrian and cycling users (i.e. gravel shoulders and no sidewalks).

Exhibit 6-2: Comparison of Rural and Urban Roadway Characteristics

Roadway Characteristic	Rural	Urban
Service Function, such as degree of mobility and land access	Relatively unlimited land access and maximum mobility	Controlled land access with associated mobility limitations
Traffic Volume and associated Level-of-Service (LOS)	Generally low traffic volumes and high LOS	Generally medium/high traffic volumes (depending on type of road) with LOS reductions during peak periods
Traffic Flow/Composition of Traffic	Free Flow Mixed	Interrupted Flows
Running Speed of traffic during off-peak conditions	Medium to High (50-90 km/h)	Low to Medium (40-70 km/h)
Vehicle Types (proportion of cars, trucks, buses)	Can include high percentage of heavy vehicles. May include slow moving vehicles including farm vehicles	May include high degree of heavy vehicles but only on designated major routes

Under the proposed guidelines, every road in the County of Brant that is not under provincial jurisdiction (Controlled Access Highway 403 and Provincial Highway 24) would be categorized as one of the following:

- Urban Public Lane
- Urban Residential Local
- Urban Industrial Local
- Urban Residential Collector
- Urban Industrial Collector
- Urban Arterial
- Rural Arterial Road
- Rural Collector Road
- Rural Local Road

Note that with this classification structure, careful planning is crucial when performing new construction or reconstruction work in rural areas. If long-term growth is anticipated in an area currently under a rural designation, roadways should be designed appropriately (i.e. as settlement designation or with allowance for upgrades) to accommodate this future growth.

The proposed guidelines for this road classification system are summarized in Exhibit 6-3. The table provides the primary functional and design characteristics of each roadway class listed above.

Characteristic	Urban Public Lane	Urban					Rural		
		Local		Collector		Arterial	Arterial	Collector	Local
		Residential	Industrial	Residential	Industrial				
Land /Traffic Service	Land access only function	Land access primary function. Traffic movement secondary consideration		Traffic movement/land access of equal importance		Traffic movement primary	Traffic movement primary	Traffic movement/land access of equal importance	Individual property access primary
Traffic volume (veh/day)	< 250	< 1,000	< 3,000	1,000 – 20,000	1,000 – 12,000	5,000 – 30,000	1,000 – 20,000	200 – 10,000	200 – 5,000
Design Speed (km/h)	40 - 50	60		60 – 70		80 - 90	80 - 100	60 – 100	50 - 80
Average off-peak running speeds (km/h)	20 - 30	40 - 50		50 – 60		70 - 80	60 – 100	60 – 90	50 - 70
Vehicle Type	Passenger and service vehicles	Passenger and service vehicles	All types	Passenger and service vehicles	All types	All types	All types up to 20% trucks	All types up to 10% trucks mostly single unit type	
Desirable Connections	Public lanes, Locals	Public lanes, Locals, Collectors		Locals, Collectors, Arterials		Collectors, Arterials, Freeways	Collectors, Arterials, Freeways	Collectors, Arterials	Collectors, Locals
Pedestrian and Bikeway Facilities	No sidewalks or bike lanes/paths	Sidewalks on one or both sides. Shared bike route. No on-road bike lanes.		Sidewalks on both sides. On-road bike lanes or wide curb lanes.	Sidewalk on one side. No on-road bike lane	Sidewalks on both sides. Dedicated on-road bike lanes where required.	Sidewalks not required, but shoulder bike lanes may be considered if speed limit is less than 80 km/h[14]		
Transit Service	Not Permitted	Generally Avoided		Permitted		Permitted	Generally Avoided		
Road Right-of-Way Width (m) (typical)	6 –10	15 – 22 (20 m)		20 – 26		24 - 45	24 – 45		20 – 24
Travel Surface Width (m) (typically)	5 – 6	8.5	13	10	14	8.5 - 15	8.5 – 13		8.5 – 13
Parking Provisions	No Parking	Parking on One Side		Parking on One Sides		No parking	No Parking		
Traffic Calming	Not Provided	Where Required	Not Provided	Where Required	Not Provided	Not Provided	Not Provided		

Exhibit 6-3: Road Classification Guidelines for the County of Brant

[14] Sidewalks and bike lanes should be provided if the rural roadway is a connecting link between settlement areas or a major recreation attraction, or is a rural roadway falls along a bicycle route.

6.2.4 ROADWAY CLASSIFICATION DESCRIPTIONS

Urban Public Lanes - Although there are few public lanes in the County of Brant, they can be located in settlement residential or industrial/commercial areas, serving simply to provide land access and should only connect with local roads. Through traffic is generally prohibited, as traffic movement is not a consideration. Public lanes are intended for low volumes (< 250 veh/day) and low speeds, with no provision for pedestrian, cyclist or transit facilities. Existing public lanes in the County are found in the heritage sections of the Paris area.

Urban Locals - The primary function of local roads is to provide land access to adjacent residential, commercial, industrial or other uses. The movement of traffic is a secondary consideration. As such, roads that are designated as locals should be planned to avoid frequent through traffic. Since volumes should be low, no special facilities are required for cyclists; however, sidewalks should be provided to separate pedestrians from traffic and parking. In the event that volumes increase beyond a safe or desirable level due to “cut-through” traffic, traffic calming measures may be investigated and introduced on residential local roads to decrease travel speeds and mobility.

Under the proposed classification, locals are categorized as either residential or industrial, depending on the adjacent land use. Traffic volumes on industrial locals are permitted to be higher than residential locals due to the potential for higher number of trips generated. Note that the recommended roadway width for residential local roadways is limited to 8.5 m. This width provides enough space for two lanes of travel and parking on one side, but is narrow enough to discourage high travel speeds. For industrial local roads, the roadway width is permitted to be higher to accommodate the increased physical requirements of heavier vehicles.

Urban Collectors - Collector roads balance the provision of traffic mobility with land access. Their primary function is to move traffic to and from residential neighbourhoods and commercial/industrial districts. Collectors act as the connection between local roads and arterials. Therefore, they represent that major access point to and from areas of development. Collectors are categorized as either residential or industrial, depending on the adjacent land use. Although both types typically service volumes greater than 1,000 veh/day, residential collectors may service volumes up to 20,000 veh/day while industrial collectors may service up 12,000 veh/day. The upper volume threshold for residential collector roadways should only be attained in cases where a community-based use is present in the neighbourhood (i.e. community centre, school, etc.).

If collector roads experience daily volumes in excess of these recommended thresholds, the first action should be to identify the cause of the increased volumes. In many cases, an increase in volume on collector roadways is an indication of arterial network deficiencies that cause drivers to seek alternative routes. Improvements to the adjacent arterial network should be investigated that will remove traffic from the collector. In the case of a residential collector, traffic calming may be introduced where required, but should be limited to horizontal features or passive treatments. In any event, the collector should not be upgraded to arterial classification on the sole basis of volume if the other primary characteristics of the collector remain unchanged.

Residential collector roads should include dedicated space for bikeways such as exclusive on-road bike lanes in response to an overall bikeway plan, and sidewalks should be provided for pedestrian movement. Parking may be provided on one side of the street. The recommended roadway width is limited to 10 m for residential collectors and 15 m for industrial collectors to provide enough space for two lanes of travel and parking on one side. This road width is slightly higher than the road width for local roads, allowing for increased mobility while still discouraging higher travel speeds.

Urban Arterials - The main function of urban arterial roadways is to provide mobility. Therefore, arterials typically service higher volumes of traffic than collectors, and traffic speeds are often

higher on arterials. It is recommended that sidewalks and dedicated bikeways or separate cycling facilities be provided on all urban arterials. The roadway width is permitted to vary for arterials due to the higher range of intended use and varying adjacent land developments. Parking is generally prohibited on arterials and traffic calming is not recommended.

Rural Arterials - The primary function of rural arterial roads is to provide mobility to traffic throughout areas of low density and low developmental activity. Rural arterial roads typically link centres of activity separated by large distances and provide connections with collectors, other arterials, highways and freeways. Rural arterial roads typically service relatively high volumes of traffic (up to 20,000 veh/day) at high speeds, and therefore flow should be uninterrupted along the majority of the roadway. Features such as transit, parking, and traffic calming are not applicable on rural arterial roads due to the nature of the surrounding land use and intended service function. Pedestrian and cyclist facilities are not generally provided, unless the roadway links two areas of development separated by reasonably short distance, or if the roadway falls along County plans for a walking and cycling network. Many of the currently designated County Highways and County Roads in the County of Brant Official Plan would be designated as rural arterial roads.

Rural Collectors - Rural collector roads are very similar in design to rural arterials, but differ slightly in service function. The function of rural collector roads places more importance on land access, servicing lower traffic volumes at slightly lower speeds along road sections with multiple rural access driveways. It is recommended that rural collectors roads provide connections only with rural arterials and other rural collectors. The roads designated Collector Roads on Schedule C of the existing County Official Plan would be expected to classified as Rural Collector Roads.

Rural Locals - In rural areas, the rural local roads provide land access to adjacent farmsteads and agricultural and aggregate operations. In most cases they are previous minor township roads that provide for basic access requirements. The movement of traffic is a secondary consideration on these roads.

Based on the above road classification system, the following actions are recommended:

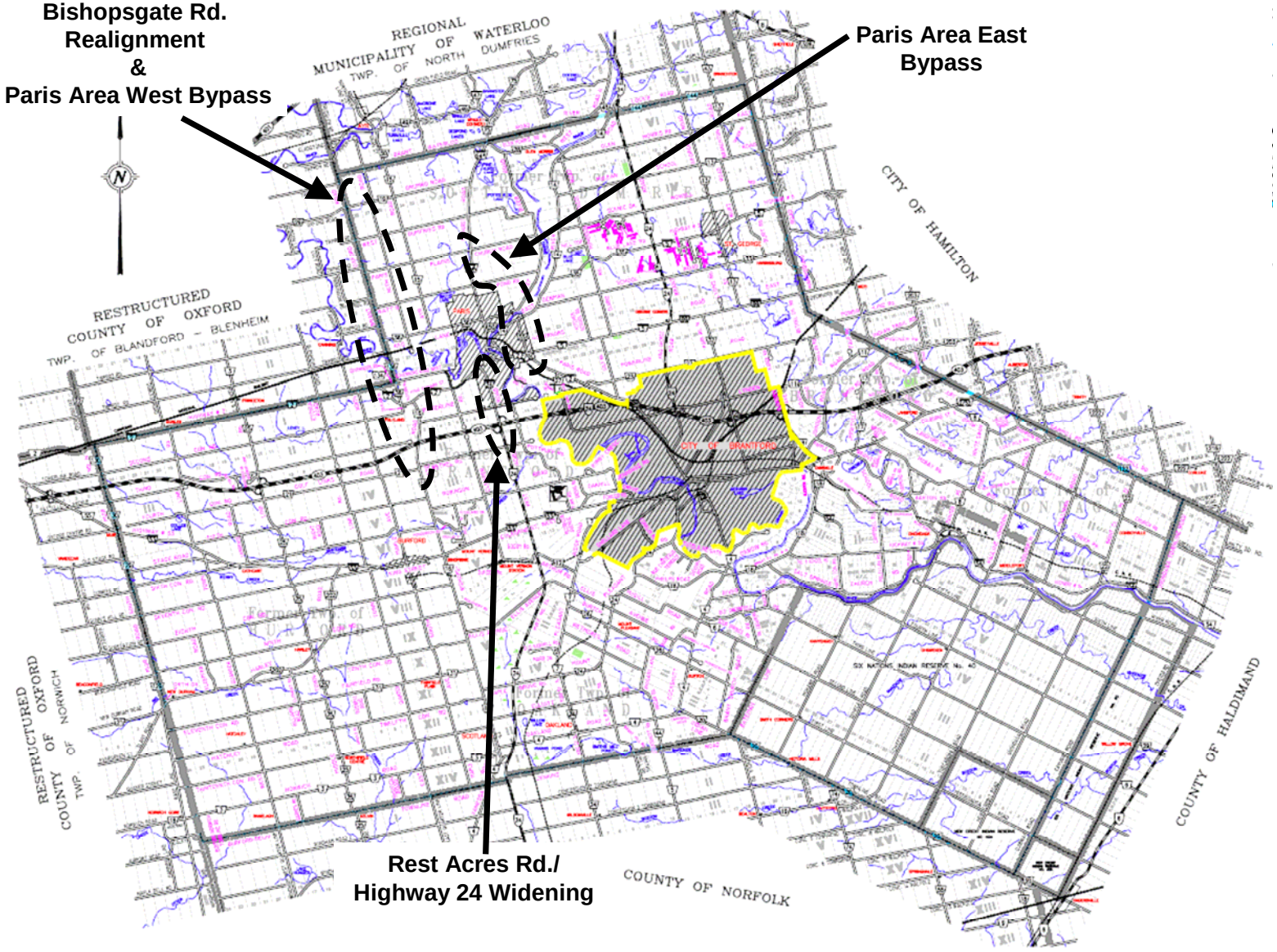
- Incorporate the proposed road classification system definitions into the new County of Brant Official Plan and the Engineering Standards Manual (this manual includes geometric parameters for Local, Minor Collector, Major Collector and Arterial Roads, plus guidelines for sidewalks, boulevards and other road design elements); and

- Revise the Transportation Schedule of the new County Official Plan to reflect the new road classification system for rural roads, and for urban roads in each of the County's designated urban settlement areas.

6.3 Strategic Roadway Improvements

Section 5.4 of this TMP summarizes the strategic roadway improvements planned in the County's Official Plan, and further improvements and capacity enhancements that are expected to be required as a result of planned County growth. The following actions are recommended as part of this TMP to update the strategic roadway improvement planning in the County, with locations shown on Exhibit 6-4.

Exhibit 6-4: Strategic County Road Improvement Areas



6.3.1 ROADWAY CAPACITY ENHANCEMENTS

Rest Acres Road - One of the most critical medium and long term transportation improvement needs the County will face is enhancement of travel capacity in the SW Paris area. Since 70% of the County's population growth and most of its employment growth will be located in SW Paris, it is recommended that the County plan on enhancing the capacity of Rest Acres Road by widening the road to two lanes per direction from King Edward Street to the Highway 403 interchange in the medium term by 2021. The capacity of this critical link should also be protected by limiting access to Rest Acres Road from surrounding new developments. Inclusion of on-road bike lanes on the widened road is also recommended to provide active transportation access between these new developments and the existing Paris urban area, in response to the Towards Sustainability strategic direction recommended in this TMP for the County.

Associated with this Rest Acres Road capacity enhancement may be the need to upgrade the King Edward Street intersection, and consider widening of King Edward Street to two lanes per direction along the entire length from Church Street to Rest Acres Road to avoid turning movement congestion.

Beyond 2021, as the SW Paris area grows to planned buildout by 2031, one additional travel lane per direction will be required in the area to serve the ultimate trip generation. The options for this added capacity enhancement would be to:

- Further widen Rest Acres Road to three lanes per direction. This is not recommended since a six lane road would not be compatible with the "avenue" character planned for Rest Acres Road through the SW Paris urban expansion area;

- Upgrade Cleaver Road between King Edward Street and Highway 403 or Bethel Road with a new interchange provided at the highway as a municipal initiative following the MTO Class EA. However, there may be insufficient weaving distance between Cleaver Road and the existing Rest Acres Road interchange to make this feasible; and therefore may not be acceptable to MTO[15]

- Upgrade Bishopsgate Road with a new interchange at Highway 403, as a municipal initiative following the MTO Class EA. Although located outside and west of the SW Paris urban expansion area, Bishopsgate Road offers the potential to attract traffic from north and west of the Paris area and provide access to Highway 403. As discussed in Section 6.3.2, improving Bishopsgate Road also holds the potential to improve traffic access west of the Paris area as a potential Paris bypass route (see Section 6.3.2).

One of the purposes of each of these capacity enhancement options is to increase the attractiveness and use of Highway 403 as a major traffic carrier in the Paris area, linking the Paris area with Brantford and points east. It is recommended that Rest Acres Road be protected for an ultimate four lane cross-section with turn lanes or roundabouts (see Section 7.5.2) at the limited access points.

In the case of widening King Edward Street between Church Street and Rest Acres Road, it is expected that a Municipal Class Environmental Assessment (EA) will be required before this improvement can be undertaken. Similarly, a Class EA will be required to improve Bishopsgate Road as part of intersection and alignment improvements in that area (see Section 6.3.3). In the case of widening Rest Acres Road to four lanes between King Edward Street and Highway 403, this widening is recommended in the Secondary Plan approved under the Planning Act. Therefore,

[15] Weaving distance is the length needed for vehicles to enter or leave a freeway

the County can proceed to construct that portion of Rest Acres Road under the County jurisdiction without any further Class EA requirements. Associated construction of Highway 24 to the municipally controlled Rest Acres Road will be subject to the requirements of the MTO Class EA for Ontario Highways.

If planned employment growth south of Highway 403 requires improvements to Highway 24 from Highway 403 to Bethel Road, a MTO Class EA for Ontario Highways will be required.

In the long term between 2021 and 2031, if planned employment growth south of Highway 403 required an extended Rest Acres Road widening to four lanes along Highway 24 from Highway 403 to Bethel Road, then the MTO and County may be required to conduct a Class EA for this section of road widening.

Paris Road – Since Paris Road currently provides a direct connection to Brantford and Highway 403, its capacity to accommodate traffic growth in the Paris-Brant corridor must also be protected through careful access management and appropriate capacity enhancement. By widening Rest Acres Road, and potentially widen Bishopsgate Road in the long term to accommodate SW Paris growth and development, it is expected that additional widening of Paris Road may not be required, as long as the operational capacity of the road can be maintained. However, observations of current peak period traffic volumes on the two lane Paris Road from Governors Road to south of Powerline Road suggest that further analysis of the role and function of Paris Road should be conducted. The County should consider various options available to enhance the capacity of Paris Road, where required along the road and at intersections, in order to maintain an adequate Level-of-Service on the road.

Intersection Capacity Enhancements - The current Official Plan also recommends intersection improvements at five strategic intersections previously listed in Section 5.4.1. However, this TMP recommends that all major intersection improvements first be the subject of an Intersection Control Study, and should not be identified in the Official Plan. This approach will provide the County with flexibility in where and how intersections are improved based on more detailed technical analysis.

6.3.2 PARIS AREA BYPASS

One main transportation issue identified in the County of Brant by this TMP involves traffic conditions within the Paris urban area. This TMP has concluded that much of the public concerns about traffic volume and speed within the area are perceived, and have arisen as traffic volumes have grown in response to urban and regional growth. However, the existing road network Level-of-Service analysis reported in Section 2.4.1 concludes that from a technical volume/capacity perspective, the main intersections and routes in Paris are operating at acceptable levels. The only locations of potential concern that require monitoring as traffic volume grows are the Church St./Dundas St./King Edward St. intersection, and Grand River Street North through the downtown in response to retail and mixed use redevelopment being encouraged in the core. Other intersections of concern have either already been addressed by the County, for example the Willow Street/Dundas Street intersection where an Environmental Assessment (EA) for improvements was completed in 2007, or will be addressed through the County's monitoring of traffic conditions and establishment of warrants and EAs for needed improvement.

However, the one element of traffic in the Paris urban area that has been observed as being a concern that will have to be addressed is the volume of heavy vehicles (trucks) using roads in the downtown area. Heavy trucks move through the downtown area from origins and to destinations to the north, mainly Waterloo Region along Pinehurst Road, and to and from Highway 24, Branford and Highway 403 to the east via Governors Road East and Paris Road. This results in use of Grand River Street and Dundas Street as primary truck routes within Paris. Truck travel from Grand River

Street west to Rest Acres Road and Highway 403 is limited by the steep grade on King Edward Street.

The Truck Route Study completed for the County in 2004 by TSH concluded that two alternative bypass routes around the Paris area should undergo a further detailed Environmental Assessment to select the preferred routing (see Section 2.2.3). This TMP supports this recommendation to at least protect a feasible Paris bypass route, thereby allowing the County to enact a truck route bylaw that would divert heavy trucks around the settlement except for internal trip origins or destinations. The two alternative routes for this further EA analysis are shown on Exhibit 6.4:

- Brant-Oxford Road, Puttown Road and Bishopsgate Road to a new Highway 403 interchange west of the settlement; and

- Extend Green Lane from Pinehurst Road to Governors Road and Paris Road.

More recently, the County has identified and signed a Highway 24A Alternative Route to the west of the Paris settlement, with the intent of providing all through traffic, including heavy trucks, with an alternative to traveling through Paris. Trucks traveling to and from Highway 403, and points south and north, are directed to routes that avoid the entire Paris settlement area. However, with no truck route bylaw in place, the County has no legislative authority to limit through truck trips to the alternative routes, or to require that non-compliance with the intended truck routes be enforced,

6.3.3 NEW ROAD CONSTRUCTION

The current County of Brant Official Plan includes the following five new roads recommended for construction in the County. Each have been assessed based on the growth and transportation planning conducted as part of this TMP preparation, with the following recommendations being made regarding new road construction:

1. **Bishopsgate Road Realignment -** Associated with the previously discussed need to upgrade Bishopsgate Road as part of a potential Paris bypass route and to provide added capacity to accommodate SW Paris trip generation, this TMP recommends that the County should continue to plan for the realignment of Bishopsgate Road from a new Highway 403 interchange to link with Brant-Oxford Road. It is understood that such an extension would potentially impact on the natural and social environments, and this would have to be addressed and mitigated as part of the Environmental Assessment and road design process, depending on what route is preferred for this extension.

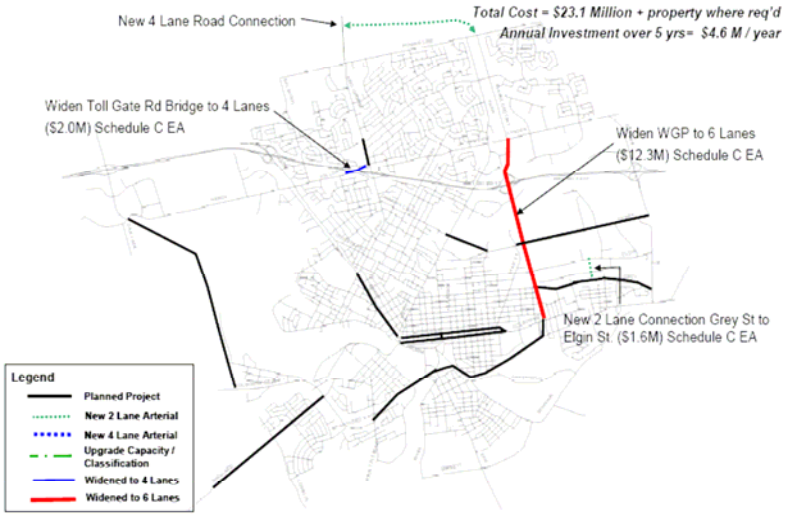
   According to Appendix 1: Natural Heritage Features in the County Official Plan, the area between Highway 403 and Brant-Oxford Road includes the Nith River and associated Provincially Significant Wetlands, significant woodlands and Provincially Significant Life Science ANSI (Areas of Natural and Scientific Interest). The improved link and interchange would be required in the medium term by 2021 based on County growth forecasts.

2. **Phelps Road Extension from Mount Pleasant Road to Bishopsgate Road –** This extension is included in the Official Plan to complete a continuous southern bypass of Brantford that would extend from Bishopsgate Road to Highway 403 via Brant County Road #18 to Colborne Street East and Highway 403. While this TMP recognizes the extensive amount of residential growth occurring in SW Brantford in the Shellard Lane/Conklin Road area that would potentially use this bypass route, it also recognizes that the City of Brantford TMP recommends major roadway network capacity enhancements from the SW area to the rest of the City and Highway 403. That plan recommends widening the Veterans Memorial Parkway (formerly BSAR) to 4 lanes by 2011 to increase road capacity

across the Grand River to accommodate ongoing growth in the West Brant area and new development in the SW quadrant of the City. Further network enhancement is planned by 2016 to widen Shellard Lane to 4 lanes and extend the Veterans Memorial Parkway to Wayne Gretzky Parkway to serve the SW development area.

The City's ultimate roadway network improvements are shown on Exhibit 6-5 taken from the City's TMP, and brings into question the need and justification for a major roadway extension in the County to the west when no further growth is planned in this area. Furthermore, constructing a major roadway extension in the County to primarily serve trips by City residents should be questioned. As a result, this TMP does not include the Phelps Road extension as part of the County's road network improvement plan.

Exhibit 6-5: City of Branford Road Network Improvement Plan



3. **Scotland Bypass –** The Official Plan includes a proposed bypass of the Scotland community from Elliott Road south to Norwich Road. No public or agency input has been received as part of the TMP project supporting the need for such as extension. Furthermore, traffic analysis conducted as part of the TMP preparation did not identify any Level-of-Service deficiency in the community that would justify a bypass, and as a result it is not included in the County's road network improvement plan.

4. **Link Phelps Road and Tutela Heights Road –** The Official Plan includes this very short road link, which is intended to protect a right-of-way for a possible realignment of Tutela Heights Road should riverbank slope instability make the existing road unsafe for public use. As a result, this short road realignment is preserved in the TMP.

5. **Park Road North Extension –** The County Official Plan includes a new road extension of Park Road North from Powerline Road to Governors Road to the east. Similarly, the City of Brantford TMP recommends protection of a corridor to link Wayne Gretzky Parkway or Garden Avenue with Highway 24 to alleviate Highway-oriented traffic conditions in north Brantford and along Powerline Road. With MTO currently studying the location of new access between Highway 401 in Cambridge and Highway 403 in Branford within the Highway 24 study area, it is premature to include any roadway plans in this TMP that relate to Highway 24. As a result, this planned extension is not included in this TMP.

6.3.4 ROADWAY ACCESS MANAGEMENT

Access management on public roads is achieved through the logical application of planning and design strategies. Access management is required to maintain the operational capacity of roads and functional integrity of the roadway network. This TMP section recommends guidelines for access provisions on and within the functional area of the County of Brant road network. The recommended guidelines are based on the County's current access management standards, and a state-of-the-practice review of other jurisdictions and transportation organizations.

The County's population and employment growth being experienced and planned in both urban and rural areas has resulted in the need to manage truck routes, emergency and routine detour routes for provincial Highways 403 and 24 and local access to private homes and businesses in the County. The objectives of roadway access management in the County are:

1. Provide a safe operating environment for all road users;

2. Allow motorists to operate vehicles with fewer delays, and less fuel consumption/emissions;

3. Coordinate land use and transportation decisions over time while providing reasonable access to properties at interim and ultimate conditions; and

4. Maintain the functional integrity and efficiency of County roads.

Based on the above objectives, the following principles have been developed for roadway access management in the County:

- **Limit Direct Access** – To preserve its through traffic function, frequent and direct property access must be limited on County roads through the application of site interconnection and the proper development of local/internal road networks;

- **Promote Intersection Hierarchy** – Proper intersection hierarchy is required to ensure that arterial and major collector roadways connect efficiently, and minor roadways and private accesses are minimized and are given a lesser consideration in traffic control;

- **Preserve the Functional Area of the Major Intersections** – The functional area of an intersection is where motorists are responding to the intersection and the approach signs, markings and other visual cues. Within this area motorists may be decelerating, manoeuvring into an adjacent lane and processing critical information in order to proceed, stop or negotiate a turn. Poorly located accesses within the functional area can severely impact the capacity of the intersection or a critical turning movement;

- **Locate Signals to Favour Through Movements** – Long and uniformly spaced signalized intersections on major roadways enhance the ability to provide a reasonable level of two-way coordination. Conversely, the lack of signalized access at regular intervals in a built-up area may decrease major road throughput by creating excessive side street demands at a limited number of locations, i.e., they become the system bottlenecks; and

- **Limit the Number of Conflict Points and Separate Multi-Threat Locations** – Road users are more likely to make judgement errors and have collisions when they are presented with complex conditions involving multiple conflict areas. Road users need

sufficient time to address a driving task or potential conflict before being presented with another.

Access management is often a process involving trade-offs and balancing competing objectives between mobility and accessibility. While property access is obviously an important prerequisite to successful property development, it can be negated by congested arterial conditions that limit access and create a negative image of adjacent property development (i.e. commercial uses). Therefore, it is recommended that in the County of Brant's roadway access management, County or arterial roadway mobility and Level of Service should take first priority in the planning of access and intersection operations. This should be interpreted and applied as meaning that any proposed access or intersection treatment that is determined to be potentially detrimental to the operation of a County road can be denied.

Design standards used for access management measures in the County such as driveways and driveway spacing must conform to the **County's Development and Engineering Standards** and other applicable County bylaws, as well as the Ministry of Transportation's **Geometric Design Standards for Ontario Highways Manual** and/or the **Geometric Design Guide for Canadian Roads** by TAC. These standards must also be applied consistently across the County, with the rationale clearly described to the public and equitably administered. This approach is recommended to ensure ease of use and user understanding of all access management and intersection operation measures in the County, and to avoid liability claims against the County rising from substandard access control and intersection operations.

Access management and intersection operations should be applied and designed not only for auto traffic, but also for commercial vehicles, transit vehicles, cyclists, pedestrian and persons with special mobility needs. This multi-modal approach to access management ensures that the person-carrying capacity of arterial roads is optimized, as well as the vehicle capacity.

Traffic control warrants and access design standards often involve a range of values such as lane widths between x and y metres, or intersection volumes between x and y vph. In these cases, although maximum values may be desirable when making access management or traffic control decisions, the minimum values often become the norm. This situation can be avoided by setting the minimum standards that represent the desired values, with a supporting deviation process that allows consideration of lesser standards where unique or special conditions make the use of the minimum standards unrealistic. This approach to minimum design and warrant standards provides a degree of access control management that is restrictive, but with special allowances and consideration of alternative solutions. For example, some municipal traffic agencies include a formal appeal procedure in cases where access permits are denied. A more common approach is for the municipal decision-makers to consider alternative access provisions to offer an applicant, should the preferred access request off an arterial road be denied.

The need for safe and convenient traffic operations at an acceptable Level of Service should be the paramount priority for access management and traffic control planning in the County. This priority begins with the functional classification system established for the County's roadway network as the guiding system for access management and traffic control. The importance of the classification system allows the same level of access and control to be provided to all County roads in the same functional class.

As noted previously, there may be times when land use and urban design policies may compete with access management policies. For example, in order to provide a more pedestrian oriented street frontage, it may be desirable in some areas to face homes and businesses towards the street and allow access directly off an arterial road, similar to what occurs on some of the older streets for example in the Paris settlement area today. However, there are ways to achieve the desired urban

design objectives as well as access management. For example, homes and businesses along an arterial could face the street, with all pedestrian access occurring at the front, while vehicular access could be provided by a local street or laneway.

6.4 Provincial Highways

In the review of roadway and transportation-related issues currently found in the County of Brant, consideration was given to the role of the provincial highway system. The following general requirements and site specific conclusions and recommendations will be recognized by the County.[16]

6.4.1 GENERAL MINISTRY REQUIREMENTS

In addition to all the applicable municipal requirements, all proposed development located in the vicinity of a provincial highway within the MTO's permit control areas defined under the Public Transportation and Highway Improvement Act (PTHIA) will also be subject to MTO approval.

The following summarizes the MTO's permit control areas under the Public Transportation and Highway Improvement Act:

- An MTO permit is required if you want to:
    - Place a building, structure, entrance or any road within 45 m of the limit of any highway, 180 m of the centre point of any intersection (on King's Highways) and 395 m of the centre point of any intersection or interchange (on controlled-access highways);
    - Place a sign 400 m of the limit of the highway; and
    - Change the use of land in a way that will generate large amounts of traffic (note that all roads are considered to be large traffic generators) 800 m of the limit of the highway.

New entrances or the upgrading or entrances, location of buildings, signs and encroachments within MTO's permit control area of a provincial highway will be subject to the approval of MTO. Where the requirements of MTO exceed those of the municipality, MTO requirements will be met despite recommendations contained elsewhere in this CBTMP.

For major development proposals for large traffic generators within the permit control area of a provincial highway, the MTO will require an application to prepare a transportation impact assessment in accordance with its "General Guidelines for the Preparation of Traffic Impact Studies". The main purpose of a Traffic Impact Study is to determine how the transportation impacts of a proposed development or redevelop can be mitigated and addressed in a manner that is consistent with the objectives of the MTO. The Traffic Impact Study also serves as the basis for the identification and evaluation of transportation related improvements or measures to be included as a condition of access approval, including funding, for the development or redevelopment. The ministry may consider the use of County approved criteria stipulated in Section 7.5.3 of this CBTMP dealing with Requirements for Transportation Impact Studies.

The County and the MTO will work cooperatively with respect to the planning of land development and associated access connections within the MTO's permit control area adjacent to all provincial

[16] Information in Section 6.4 provided by MTO in their letter to IBI Group dated November 3, 2008

highways and interchanges within the County, in order to protect for the future safety, operation and capacity of both the provincial highway network and the County's transportation corridors for the movement of people and goods.

6.4.2 HIGHWAY 403 / HIGHWAY 24 /REST ACRES ROAD

The following specific criteria with regard to access to Highway 24 and Rest Acres Road will apply to the Southwest Paris Urban Settlement Area.

No new full movement public road, private road or commercial access connections will be permitted by MTO from Highway 24/Rest Acres Road between Bethel Road and Powerline Road. All access to Highway 24/Rest Acres Road will be via Bethel Road and Powerline Road. Existing access for the current use and zoning will be permitted to remain.

Highway improvements necessitated by land development within MTO's permit control area as specified by the PTHIA will generally be the responsibility, financially and otherwise, of stakeholders and municipalities. Improvements will be based on the recommendations of a MTO approved Traffic Impact Study, which will identify the transportation needs and traffic impacts that land use development will have on the surrounding highway network including the interchange of Highway 24 and Highway 403. The cost of a Traffic Impact Study will be the financial responsibility of the stakeholder (municipality and/or applicant).

6.4.3 HIGHWAY 403 / BISHOPSGATE ROAD

In the question of constructing a new interchange at Highway 403 and Bishopsgate Road, MTO has provided the County with the following input:

- The location of an interchange at Highway 403 and Bishopsgate Road has been found to be acceptable and can be incorporated into the Official Plan and TMP of the County;
- The ministry will only consider an interchange location which has the potential to be developed into a fill Parclo A-4 design, constructed in accordance with ministry design standards;
- The County will be responsible, financially and otherwise, for both the Municipal Class EA and the Class EA for Provincial Transportation Facilities. Financial responsibility will not be limited to design, construction and construction administration; and
- The County would be required to control development along Bishopsgate Road between Powerline Road and Bethel Road. No new full movement public road, private road or commercial access connections will be permitted from Bishopsgate Road between Powerline Road and Bethel Road.

6.4.4 HIGHWAY 401 / TRUSSLER ROAD

As part of the TMP study, the study considered the potential for a new provincial highway link west of Paris aligned with Brant-Oxford Road and Trussler Road to Highway 401 to the north. Although MTO can support a new interchange at this location, the extensive re-construction requirements needed at this location are also noted. Associated costs would be the responsibility of involved municipalities.

The TMP concluded that the cost/benefit of such a project may not be justified. Furthermore, the project would involve the Regional Municipality of Waterloo and County of Oxford as proponents or at least host municipalities. There was no indication provided that the Region is contemplating this project as part of its new TMP update, and it is not in the new County of Oxford TMP.

MTO had also earlier responded that their focus was on a new eastern link between Highway 401 and Highway 403 in the Highway 24 corridor on the east side of the County of Brant that was being studied in the initial Highway 24 Transportation Corridor Planning and Class Environmental Study. At that time the possibility of a new west side highway link had been screened out from further consideration, but has since been reintroduced by MTO in their modified study area (see Exhibit 2.2) for the Brantford to Cambridge Transportation Corridor EA.

6.4.5 HIGHWAY 403 / GARDEN AVENUE INTERCHANGE

No new full movement public road, private road or commercial access connections will be permitted by MTO from Garden Avenue between the Highway 403 westbound ramp terminal and Lynden Road. All access to Garden Avenue north of Highway 403 will be provided via Lynden Road.

No new fill movement public road, private road or commercial access connections will be permitted by MTO from County Road 18 south of Highway 403 between the Highway 403 eastbound ramp terminal and Henry Street. Access to the lands in the southeast quadrant of the interchange will be provided via an extension of Henry Street.

6.5 Transportation Demand Management

For the County of Brant to move Towards Sustainability as a long term transportation planning strategy, one of the policy directions that is required involves the role that Transportation Demand Management (TDM) should realistically play in the County.

TDM is defined as strategies and actions intended to reduce the demand for vehicular travel by changing travel demands, times and modes. The objective of TDM is to make more efficient use of the existing transportation system, and reduce or at least maintain the environmental impacts of growing vehicular travel. As shown on the Exhibit 6-6 below, TDM strategies are applied to the demand side of the transportation supply/demand relationship through three types of strategies:

Exhibit 6-6: Types of TDM

Structural Strategies (Supply-Side)	**TDM Strategies (Demand-Side)**		
Widen Roads Add Travel Lanes Build New Roads Add Bicycle Lanes Improve Roadway Geometrics & Conditions Divert Traffic	**Market-Based:** User Pay Parking Supply/Pricing	**Behaviour-Based:** Transit Service Telecommuting Ride-Sharing Peak-Hour Shifts	**Land Use-Based:** Increase Density Mixed Land Use

Market-Based strategies affect the individual or collective cost to travel. Behaviour-Based strategies affect the personal decision on when and how to travel. Land Use-Based strategies

affect the functional relationship and proximity between major travel origins and destinations, most notably the home/work trip.

The following is a summary list of the types of TDM measures most commonly being considered or applied in North American municipalities. Most are not applicable in a rural context such as the County of Brant, although some selected measures may be applied in urban communities such as the Paris area:

TDM Strategy	Applicability for County of Brant
Market Based:	
User Pay – includes measures to increase the cost of travel by the private automobile, especially during peak hours, to reduce or eliminate trips, encourage them to be made at different times or use an alternative travel mode. User pay is usually applied using road tolls.	NO, toll roads would be difficult to operate on a rural grid network as found in the County and the urban areas. The only controlled access roadway where tolling is possible is Highway 403 and MTO has no policies or plans to toll this highway.
Parking Supply/Pricing – involves limiting the supply of long term employee parking and increasing the cost to encourage employees to use alternatives to the private auto.	NO, limiting long term employee parking in any area of the County, and especially in the urban communities, can discourage economic development and investment.
Behaviour-Based:	
Transit Service – expansion into appropriate areas of the County would provide an alternative to auto use in these areas.	YES, the TMP concludes that in the short-term, a private service operator should operate a Paris-area and Brantford Terminal-to-Paris service, but ridership must grow significantly before this service can have any TDM effect (see Section 6.6).
Telecommuting – has more people working from their home, thereby eliminating their peak period home-work and work-home trips.	NO, the ability to telecommute is dependent on the type of employment and the support of the employer, and is expected to reduce trip-making by no more than 5%.
Ride-Sharing – involves a number of programs designed to facilitate increased vehicle occupancy. It usually requires some degree of collective organization, for example by a large employer, to be effective.	YES, ride-sharing can be practical in the County if offered and supported by large employers, along with incentives to ride-share such as preferential parking and guaranteed ride home programs. Effectiveness would be dependent on how many employees participate. Ride-sharing can also be promoted and provided for County of Brant commuters by MTO through their Carpool Parking Facilities Policy, Procedures and Responsibilities policy. This policy was last updated in 2000, and outlines the Ministry's policy for establishing guidelines to identify the need for

	carpool lots for car pooling and scheduled commuter bus service interface that may be provided in the County of Brant associated with Highways 403 and 24. It includes the criteria for site selection, design fundamentals, Environmental Assessment requirements, construction and maintenance operations procedures, program evaluation and responsibilities. Recognizing that the use of provincial highways for inter-regional commuting has grown in recent years, MTO issued a "state of the art" report on guidelines for designing transit-supportive facilities at highway interchanges in Central Region in May 2006.[17] While a number of off-highway facilities are addressed in this report in and around highway interchanges, the guidelines most relevant to the CBTMP are: ***Commuter Parking Lot –*** *highway-based parking facility with basic transit provisions;* ***Carpool Lot*** *– with no transit service; and* ***Park & Ride Lot*** *– associated with permanent Bus Rapid Transit or Transitway routes.*
Peak Hour Shifts – encourage work trips during the off-peak periods of the day, such as before 7 a.m. and after 9 a.m. using flextime or variable work hours.	NO, many employees already use flextime or variable work hours so the benefits in the County is expected to be minimal. It also conflicts with effective ride-sharing.
Land Use-Based:	
Increase Density – in urban communities supports the use of transit and active transportation (cycling and walking) as alternatives to auto use through intensification of development.	YES, the new Places To Grow legislation includes requirements for increased density and intensification. The issue in the County will be whether existing communities will accept higher density urban forms, compared to the low density suburban expansion that has exemplified most of the County's growth.
Mixed Land Use – that has residences, jobs, retailing and services built in closer proximity, or as one combined project. This can significantly reduce the need for auto travel and promotes active transportation (cycling and walking).	YES, but Official Plan policies, specialized developers, community support and political commitment will be required in the County to see the development of enough mixed use projects to have any TDM benefit.

[17] Summary Report 2004-E-0047, McCormick Rankin Corp., May 2006

6.6 Public Transit

As reported in Section 2.3, Paris Taxi currently operates a limited Paris-Brantford-Paris minibus service to the main transit terminal in Brantford. Other transit service options available to the County are discussed below.

6.6.1 TRANSIT SERVICE ALTERNATIVES

Van/Car Pooling - A transit or commuter service can be provided through a "pooling" of resources by people located in a specific geographic area who then travel together to one destination point in one vehicle. This service can be provided in two ways:

- Service could be operated by the County to encourage people to link their trips. The County could establish a "van/car pool" telephone number, or web site, which prospective travellers would contact to register their travel needs. The County would then facilitate the communication between these travellers who would then share the use of their own vehicles and related costs. Car-pooling parking lots could also be established at strategic start and end points along major County roads between strategic trip origins and destinations.

- An Independent Agency could encourage people to share a vehicle and would provide a vehicle for use by the travellers through a form of a lease including operating costs (gas, repairs). This option functions best when delivered through a single major employer.

Demand Response Services - A demand-response service is one that is operated according to the demand for the service. Services for people with disabilities are primary examples. There are several approaches as follows:

Dial-a-Bus

The service does not follow a fixed route but operates according to the needs of users. Customers contact the driver of the vehicle to arrange their pick-up or drop-off point and the driver then develops the route according to these needs. The advantage of the dial-a-bus approach is that a larger area can be served and a more personalized service offered by fewer vehicles thereby reducing overall operating costs to serve a given area.

Shared Ride Taxi

Similar to Dial-a-Bus, Shared Ride Taxi utilizes local taxi-cabs to provide transit service. The Trans-Cab service picks up and drops off customers at designated stops.

Fixed Route Service - This service option is the most common form of public transit. It consists of regular ("fixed") routes along which vehicles (minibuses or small buses or large buses) operate according to a regular schedule. The frequency of the service (time between vehicles) can vary widely according to the area served and the demand for the service. Fixed route service can also include vehicles operating between municipalities along a highway.

6.6.2 SERVICE DELIVERY ALTERNATIVES

Transit service can be provided in several ways. These include:

- contracted service with a private operator including a taxi operator;

- contracting with an existing transit service provider, or
- direct operation by County staff.

Contract with a Private Operator - This service delivery option utilizes the resources of a private transportation operator such as a school bus operator, taxi operator or other type of private transportation firm who would provide specific services under contract. The County would be responsible for defining the services, establishing the contract and administering the service. Users would pay a set fare (similar to a municipal transit service) to use the service.

Contract with Existing Transit Service Provider - A contract would be arranged with an existing transit service provider to provide services either within a specified part or parts of the County. For example, arrangements may be made to augment the trips they offer to and from Brantford, Hamilton and Cambridge to serve County settlement areas such as Paris and St. George. However, given the limited nature of the services offered by the current private service providers, and the focus of their service, this option could be difficult to arrange and costly.

Brantford Transit could also be contracted to extend one of their regular transit routes to Paris via Paris Road or Oak Park Road. However, it is expected that such a service would have to be provided on a cost-recovery basis which may include the cost of an added bus to extend an existing route service. It would also be expected to replace any existing service provided by an independent operator. Any consideration of contracted service would require further discussions with the City of Brantford. Section 5.4.1 Short term Transit Improvements in the new City of Brantford TMP includes one recommendation to:

"consider extending service to Paris (in conjunction with County)"

Direct Operation - If the County directly operated a public transit service, the County would hire its own staff and purchase the vehicles to operate a service within the County. Under this option, the County would be restricted to operating within its municipal boundaries according to the Public Vehicles Act. Brantford Transit's licence to operate in the County is currently held by the private operator currently providing the limited shuttle service between Paris and the Brantford terminal. In order to operate service outside the County, such as to downtown Brantford, either the County would have to obtain the necessary Public Vehicles licence or contract with a licensed operator.

A rough cost estimate for the County to operate a transit service, for example to the Paris area, would depend on the service area and type of service provided. For example, if peak hour service only was provided in the Paris community, using one bus, hourly service for 6 hours a day 5 days a week, the annual service cost could be in the order of $100,000. Assuming 90 passengers a day at an average $2.00 per ride, the annual revenue could be approximately $50,000, with a resulting net annual cost to the County of $50,000.

If the service was provided all day 5 days a week, the net cost to the County would increase to approximately $100,000. If Saturday service was added, the net County cost would increase to approximately $110,000 annually.

Capital expenditures could range from $90,000 for a small shuttle-type bus to $400,000 for a 40 foot low floor diesel bus. Transit stop construction could cost approximately $15,000 per stop, and about $45,000 for transit shelters. Conversely, the County could expect to receive the $0.05/litre federal gas tax rebate through the province, equating to a rough estimation of about $50,000 per year assuming a 6 day/week, all day type of ultimate transit service in the Paris area.

Note again that these are extremely rough, conceptual cost estimates assuming optimistic ridership volumes serving only the Paris community, and could double if another County service was added, for example to the Cainsville area. So in summary, total net cost to serve the County with transit service could range from $100,000 to $225,000/year depending on the service area, plus about $1 M in initial capital costs, minus potential gas tax rebates.

6.6.3 RECOMMENDED TRANSIT SERVICE

The recent history of providing transit service beyond the boundary of Brantford shows low demand and a break-even financial performance at best. As a result, it is recommended that a private operator continue to offer a Brantford terminal-to-Paris shuttle service, but that the County of Brant and City of Branford actively support this service with advertising and marketing on their web sites, on Brantford Transit maps and marketing materials and other public information sources. Ridership data should also be monitored as the Paris area grows in population and employment to determine if and when service can be improved.

6.7 Commercial Goods Movement

Goods movement needs are often over-looked or under-represented in long-range transportation plans, yet efficient goods movement is critical for the economic success of a municipality such as the County of Brant, but is also a major transportation issue. This section discusses potential policy directions to improve the management of goods movement in the County, grouped under five broad issue themes:

- Communication and Coordination;
- Land Use Planning;
- Operations;
- Regulation; and
- Truck Route Planning.

6.7.1 COMMUNICATION AND COORDINATION

Goods movement is largely carried out by the private sector. The private sector has played an important role in the evolution of goods movement through and within the County of Brant associated with aggregate extraction, agriculture, industry and manufacturing. Continuing dialogue between social, environmental and economic proponents should be a top priority at the County to appropriately identify and address critical trucking related issues in the years ahead. The County needs to be aware of initiatives being undertaken by the goods movement industry. Likewise, the goods movement industry needs to be kept apprised of the long-term planning and transportation objectives of the County.

Government-industry advisory groups, councils, consultation boards etc. are becoming a common feature of regional governments' programs oriented to goods movement. The County of Brant currently does not have such an advisory group and thus the establishment of one would be a significant initial action to be considered to provide for meaningful consultation on policy plans.

Ongoing consultation and coordination with private stakeholders, agencies and departments of governments, and special interest groups with respect to goods movement supportive policy

proposals will need to occur on several levels. Some of the avenues through which a one-time or standing advisory group could participate include:

- Environmental Assessment processes to mitigate the risk and uncertainty of development projects;
- Acquisition of timely and useful data on goods movement trends in the County;
- Harmony between provincial highway, County road and railway regulations and municipal policies; and
- Improvement of mutual understanding of high freight service levels (i.e. the widespread use of just-in-time delivery) which increase use of roads, versus consolidation of shipments.

In addition to basic communication, there is also a need to improve data collection in order to better inform decision-making processes. At present, there is very little data collected on goods movement patterns in the County of Brant, as is the case in many other municipalities, especially rural municipalities. This becomes an issue when the County is making important decisions on the need for transportation infrastructure, or when policies are considered to divert trucks from a certain area such as the Paris downtown core.

6.7.2 LAND USE PLANNING

Compatibility issues regularly arise between truck routes and abutting land use, especially residential communities. These issues arise from the fact that land use planning and goods movement have evolved in different directions over time. For example, most parts of the County of Brant were developed long before the relatively recent phenomenon of long distance trucking or the expansion of aggregate extraction in the County. There are several actions that can be undertaken to prevent future compatibility issues, while also enhancing the attractiveness of the County for economic development investments that involve goods movement.

A critical starting point would be the establishment of a “Strategic Truck Route Network for the County of Brant”. This would essentially be a mapped inventory of all existing and future significant goods movement corridors and facilities (i.e. active and licensed pits and quarries, commercial centres and corridors, industrial plants). The private sector would be contacted to provide input on the routes used by their operations to move goods and materials by heavy truck.

Designation of this strategic truck route network would have the primary policy objective of ensuring that adequate provision is made for efficient and safe goods handling and movement. Once the strategic network has been established, and all existing and potential corridors are known, it is then possible to define existing and planned adjacent land uses to ensure compatibility. This may include, for example:

- Zoning Bylaw provisions and Official Plan policies for buffer zones adjacent to designated truck routes;
- Incentives (regulatory flexibility and/or financial relief) for intensive users of transportation and warehousing to locate in compatible zones;
- Costs such as haulage charges for heavy trucks on County roads not designated for this type of traffic (as sometimes occurs with aggregate extraction); and

- Restrictions on when and where heavy trucks can travel, which is typically the purpose of a truck route bylaw.

6.7.3 OPERATIONS

Within the scope of a TMP, operational issues related to goods movement often include consideration of commercial vehicle loading and unloading, specifically the conditions and requirements for on-street and off-street loading facilities.

In general, it is desirable to have all commercial loading and unloading occur off-street so as to minimize traffic disruptions and maximize pedestrian and vehicle safety. Policy directions should establish criteria for off-street loading/unloading for new commercial and industrial facilities, including performance guidelines for provision of off-street loading/unloading and commercial vehicle parking, depending upon the nature and extent of anticipated shipments. Such criteria can also include site-specific access and egress requirements that form part of a Zoning Bylaw.

In some cases, particularly downtown retail and commercial establishments for example in the Paris core, off-street loading/unloading is not a viable solution. In these cases, policies should focus on maintaining on-street loading/unloading with due regard to efficiency and safety of other traffic, pedestrians and transit users. The policies should consider the conditions acceptable for on-street loading/unloading, while also defining the process for permits and fees for exceptional situations. Enforcement measures should also be included such that effective observance of rules can be assured, and penalties administered, within existing administrative structures and resources of the County of Brant.

6.7.4 REGULATIONS

Given that there will always be potential issues relating to moving freight in the County of Brant, there is a need to support operational and planning policies with regulatory policies. Two areas where regulatory policies are warranted are:

- truck route designations; and,
- timing of delivery.

Truck Route Designations

The County currently does not impose restrictions on truck movements. However, restriction options include this passive approach to truck routes used in the County today, which may have worked well in the past but is now not responding to truck impacts in the Paris community, on roads connecting to Highway 403 and in rural areas associated with aggregate extraction.

Advantages of continuing with the passive approach include reduced costs for signage, ease of understanding by trucking industry, reduced enforcement burden and reduced legislative (e.g. by-law) requirements. Possible disadvantages of establishing designated truck routes include trucks disobeying the signed routes, and people may attach a negative stigma to areas that are adjacent to truck routes. One of the emerging challenges with maintaining the truck route network in some municipalities is the removal of individual truck route links in response to public demands. This has the impact of fragmenting the truck route network and undermining its effectiveness. Therefore, an important policy area is to maintain, protect and, if possible, enhance the system of designated truck routes established in a municipality.

If the municipality desires a restrictive rather than a passive truck route approach, there are a number of regulatory options available, including:

- **Vehicle Restrictions** – are most commonly based on vehicle weight, with other limitations being height, length and width as well as specific types of vehicles or loads. This approach is often implemented by default because of existing roadway obstructions or geometric limitations;

- **Time Restrictions** – can reduce impacts associated with truck routes on surrounding land use and are usually associated with night hours. When time restrictions are used, it must be ensured that the impacts on the remaining or alternative truck routes are not accentuated;

- **Seasonal Restrictions** – are usually used in rural settings where seasonal conditions (i.e. frost, snow, thaw, flooding) create structural limitations on what type of vehicles can use the road;

- **"No-Entry" Access Restrictions** – may or may not provide for local access through an area, such as the Paris or St. George downtown core for example, where an alternative bypass route exists. This requires diligent enforcement and traffic management;

- **Zonal Truck Restrictions** – are meant to cover reasonably small areas, such as a small downtown, usually bounded by arterial road truck routes (not the case in Paris), with the intent to keep through traffic out of the designated area; and

- **Local Truck Restrictions** – are similar to zonal restrictions, but only apply to one street or part of a street, and may be temporary or permanent to protect the roadway surface, narrow widths or steep slopes from heavy truck intrusion.

Timing of Delivery

The second area where regulatory polices are relevant to goods movement is in the timing of deliveries. Transportation facilities generally operate on a schedule of 24-hours/day -7 days/week. Shippers and receivers, however, often restrict their operations to the normal workday (5 or 6 days, 9 to 5); this requires goods movements to occur during peak periods of traffic.

In most cases, the incremental cost of extending hours for shipping and receiving would either incur high labour costs for a perceptibly minor activity, or would require capital investment to provide carriers with secure access to their facilities for loading or unloading. The latter case would also involve the risk of reengineering some operations. Financial incentives, such as tax credits, could help make the difference. The possible role of the County of Brant would be to provide such incentives.

6.7.5 TRUCK ROUTE PLANNING

The location of designated truck routes is dictated by the land use patterns that generate truck traffic. For example, industrial areas typically generate high goods movement activity, while downtown retailing, service and office activities generate low truck traffic volumes. Therefore, it is not surprising that the public and merchants take exception to high volumes of through truck traffic in a downtown core.

In terms of truck size, straight heavy trucks exceeding 45,000 kg in weight or 12.5 m in length generally serve terminal and warehouse type of industrial and major retail areas.[18] The presence of these vehicles in downtown cores and beside residential area is extremely noticeable.

Planning of truck routes for these and other heavy commercial vehicles, for example serving the aggregate extract industry, is dictated by engineering, social and natural conditions. Specific factors affecting potential truck route planning and designations in the County of Brant include:

- Impacts on abutting land use;
- Availability of driver and vehicle facilities along the route (fuel, parking, food and beverage);
- Provision of transportation network continuity via inter-connecting links, for example between a County Road and a Provincial Highway;
- Provide adequate structural strength and geometric design to accommodate truck weights and dimensions. For example this includes limiting sharp turns with radii determined by permitted truck types as per Transportation Association of Canada design guidelines;
- Clearance of overhead structures and obstructions;
- Travel lanes of at least 3.5 m in width;
- Vertical road grades to a preferable maximum 4 percent; and
- Provision of adequate roadway capacity so that travel time along a truck route should be comparable to, or less than, motor vehicles traveling on alternative routes.

6.7.6 POLICY RECOMMENDATIONS

Section 4.5 Truck Routes in the current County of Brant Official Plan is inadequate in providing a strong policy foundation for the development and management of designated truck routes in the County. Its reliance on a Truck Route Study that has not been adopted by County Council leaves the County with a policy gap on this subject, and in the same position regarding truck route designation as before the study was conducted.

The existing Official Plan permits truck haul routes on Arterial roads, and trucks are allowed on the provincial highways. This represents the current state of truck route legislation in the County. It is proposed that this current state be strengthened in this TMP with the following policy recommendations:

- The County should establish an as-required Trucking Advisory Group to review all transportation and land use policy and plan directives that potentially affect the trucking industry;
- The County and the Trucking Advisory Group should develop a Strategic Goods Movement Network Plan showing the origins, destinations and primary travel routes of the primary goods movement in the County. This should then be compared with the existing and planned land use patterns along these routes to highlight existing or potential goods movement conflicts;

[18] Heavy Truck Weight and Dimension Limits in Canada, Railway Association of Canada, 2003

- The County should investigate the potential designation of a new truck route bypass of the Paris community, through the use of a County Truck Route Bylaw. As previously noted in Section 2.2.4, providing the types of roadway infrastructure improvements needed to create a functional truck bypass of Paris are expected to require Environmental Assessment approval; and

- The County should consider a similar truck route designation and bylaw enforcement process around any other urban settlement area where the through movement of truck traffic is proven to be a community issue.

6.8 Active Transportation

In healthy communities, walking, cycling and other kinds of non-motorized active transportation (e.g. roller blades, scooters, skateboards, etc.) are a normal, routine part of daily life. These active modes contribute to the quality of life and public health, provide options for getting around, and are important elements of an integrated transportation system that is moving Towards Sustainability.

Promoting and encouraging walking and cycling through the provision of facilities and programs helps build active communities, and reduces the dependence on automobile transportation and the associated infrastructure costs, air quality, safety and congestion problems. With the increasing focus on the health costs of our sedentary lifestyles, daily walking and cycling are seen as essential components of a healthy lifestyle primarily in urban communities, but also in rural areas. Many communities are attempting to redesign themselves to facilitate active transportation by:

- Providing walkways and bikeways that accommodate and encourage non-motorized travel, rather than only designing communities around the automobile;

- Managing traffic with road designs that allow pedestrians, cyclists and other travelers as well as motorists to use the roads. Features that facilitate automobile use such as wide roads and intersections, large parking lots and drive-through businesses can create an uncomfortable and unsafe environment for non-motorists; and

- Encouraging walking and cycling within and between communities by managing the shape of urban growth and promoting more compact development.

Within transportation plans, policies that affect walking and cycling involve the planning, design, implementation, operation and maintenance of linear facilities (sidewalks, crosswalks, trails, bikeways, and bicycles aboard transit) and other amenities (benches, shelters, bicycle parking, etc.), and may also complement policies in other municipal programs that encourage cycling and walking (safety and education programs, bikeway maps, etc.). Examples of these programs already in place in the County of Brant include:

- The Hamilton-Brantford-Cambridge Trail brochure and map produced by the Brant Waterways Foundation in association with the Grand River Conservation Foundation and the Conservation Foundation of Hamilton Region with donations from a wide cross-section of area stakeholders;

- Best of Brant Outdoors prepared by the County of Brant Tourism; and

- The Grand River Exceptional Waters material developed by the Grand River Conservation Authority.

6.9 Off-Road Cycling Strategy

6.9.1 MULTI-USE TRAILS STRATEGY

Three main off-road multi-use trail networks in the County of Brant are shown on Exhibit 2.9 as:

- Hamilton to Brantford Rail Trail linking Hamilton and Brantford;
- SC Johnson Trail linking Brantford and Paris; and
- Cambridge to Paris Rail Trail

In 2006/07 the Trail Use Steering Committee prepared recommendations on the planning and use of the County's trail system, including the TH&B abandoned rail corridor trail purchased by the County in 2007, and the only trail in the County owned by the County. Reference is directed to the work of this Committee in the planning, implementation and management of this trail as a multi use recreational corridor.

The following additional trail planning guidelines are provided to assist the County and involved agencies in the further development of a system of active transportation trails within the County. As well, the guidelines will aid in establishing feeder/connector trails to provide access to the existing trail system, strategic municipal sidewalks, external municipal trail access points, public lands, waterways, etc. The guidelines also provide a means of cooperation between the County of Brant, the City of Brantford, Grand River Conservation Authority, Ontario Trails Council, Brant Waterways Foundation and other government and non-government agencies, service clubs and individual members of the community in the planning and development of off-road trails.

The trail system encourages public use of public lands, abandoned rail rights-of-way (rails-to-trails), streams, rivers, greenbelts and where appropriate and acceptable, private easements/rights-of-ways. With an inventory of trails in the County, specific trails could be refined, expanded or developed depending upon desire, funding, volunteerism and need. The County and involved agencies will use these guidelines to plan and prioritize trail development on an annual basis, subject to funding availability.

Trail planning guidelines recommended for the County to implement coordinated trail planning are:

- All new trail developments shall comply with these guidelines wherever relevant;
- County Council should determine overall budgetary priorities and allocations for an annual County of Brant Trail Development and Lifecycle Maintenance Program, including annual allocations for new trail development;
- The County should complete and review a minimum of every five years, and possibly over a shorter time period in the case of new phased trail develop, a Trails Master Plan that will provide the following for the County's Trail System:
    - Specific trail standards, design criteria, material applications, etc.
    - A map of all trails in the County delineating priority use, locations, access points, services, lengths, links to natural heritage and natural habitat areas, and proposed/possible future on-road/off-road trails
    - Marketing and promotion plans and materials

  - Identified linkages with the County's Transportation Master Plan, tourism newsletters and brochures, Parks and Recreation plans and the Official Plan

- The County should strongly encourage community partnerships for acquisition, improvement(s) and maintenance of the trail system. However, the absence of a third-party agreement for acquisition, improvement or maintenance should not be cause for the County to reject acceptance of a proposed trail which is in compliance with these guidelines. The acceptance of a trail does not guarantee County-funded construction or maintenance; and,

- Trails proposed for incorporation into the County's Trail System will initially be reviewed by a County Trails Ad Hoc Advisory Committee, and appropriate action taken by County Council as part of the annual budget process.

6.9.2 BASIC DESIGN STANDARDS

Basic standards for the development and maintenance of off-road trails for walking and cycling in the County of Brant should encourage accessible, logical, safe and comfortable usage, serve a wide variety of recreation and transportation modes and impact the environment as little as possible. A mix of trails suitable for use by hikers, bicyclists, equestrians and wheelchairs should be encouraged.

Generally, trail widths should be wide enough to accommodate the intended use. General specifications are provided in these guidelines. Trail grades should generally not exceed two metres per thirty metres (15% slope), but may be built steeper for short distances. Other basic planning standards include:

- Trail surfaces should be nearly level with a minimal out slope for drainage;

- Drainage dips/swales/ditches and erosion control components should be engineered and scheduled to provide maximum endurance and to minimize impact on soil and vegetative resources;

- Turning radii for curves other than switchbacks should generally be greater than 3 m;

- All trails should have signage at trail heads and distance markers at either one or five kilometre distances where possible; and

- All trails should be reviewed for support opportunities relative to services for rentals, food services, parking and related enhancement opportunities where feasible.

6.9.3 WALKING / HIKING TRAILS

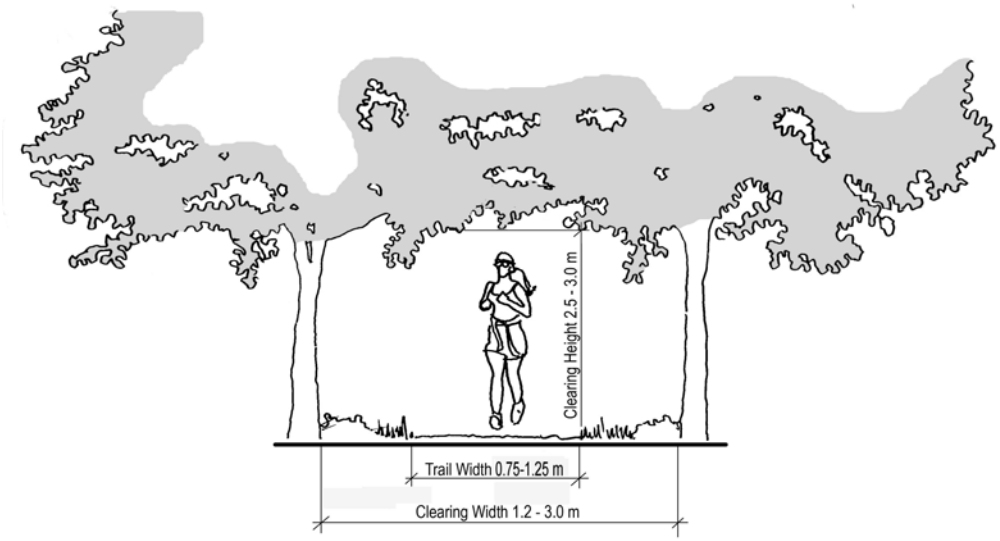
The purpose of walking and hiking trails is to provide passive recreational opportunities and connections between points of interest. The trail designs vary depending on the volume of activity. Less travelled walking trails will be narrower and will have fewer amenities. More important trails with heavier use will have greater enhancements and be wider. Walking trails will be located predominately in areas of natural heritage including woodlots, along watercourses, around stormwater management areas and as connection linkages between larger parks.

The following standards shall apply to walking and hiking trails where the County or other proponent installs trail features as shown on Exhibit 6-7:

- *Clearing Width*: 1.2 metres to 3.0 metres varying by volume of activity;

- *Tread Width:* 0.75 metres to 1.25 metres;
- *Clearing Height:* 2.5 metres with sensitivity to maintain existing vegetation where possible;
- *Surface:* compacted limestone fines or woodchips; or other suitable material;
- *Grades:* The trail is intended to match the natural terrain wherever possible. Normally the desirable grade is less than 5% with a maximum of 15% to 25% for short distances;
- The construction practices and type of material used for surface treatment should be sensitive to the surrounding natural vegetation and existing materials; and
- *Water Crossing:* Wherever possible the need to cross watercourses will be accommodated through existing bridge systems. Where necessary small bridges will be provided to accommodate walking traffic only. The bridges will be designed to minimize disruption to the waterway and provide sufficient clearance for continued canoe and kayak use.

Exhibit 6-7: Basic Walking Hiking Trail Standards



6.9.4 WALKING, CYCLING AND MULTI-USE TRAILS

Multi-use recreation trails are intended to provide opportunities for a wide range of passive non-motorized activities. These may include walking, cycling, wheelchair access, rollerblades, strollers and walkers for seniors. These trails are intended to be located in proximity to residential areas and newly developing subdivisions. These trails provide access to open space areas and link schools, and commercial and institutional activities within the community. Where possible these trails will be located adjacent to stormwater management ponds, environmental areas and natural areas.

The following design standards are recommended for multi-use recreation trails as shown on Exhibit 6-8:

- *Clearing Width:* 5 metres to 8 metres with some impact on adjacent vegetation;

- *Tread Width:* 2 metres to 2.7 metres; 3 metres to 4.5 metres where the tread width anticipates significant cycling activity;

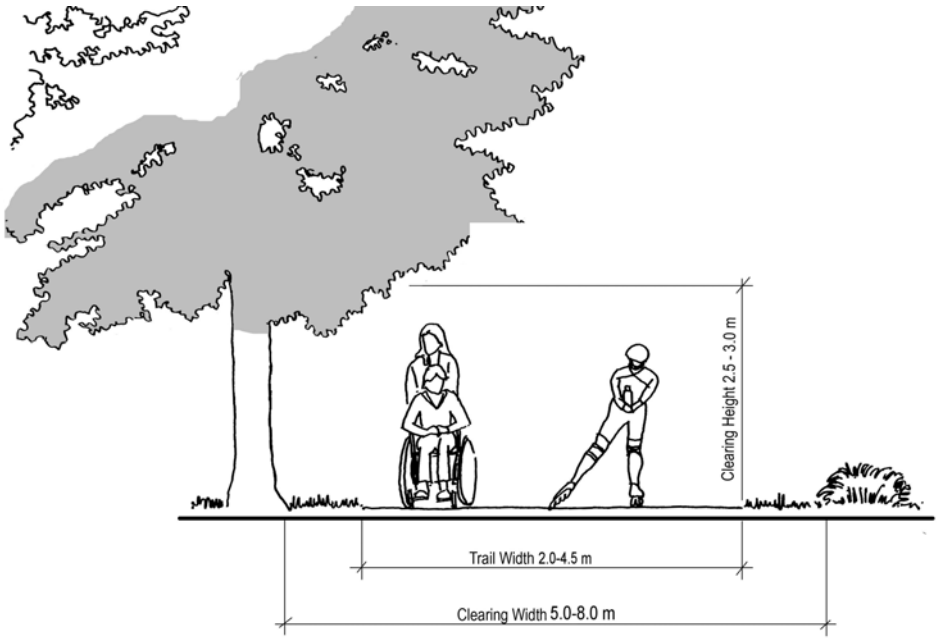
- *Clearing Height:* 2.5 metres to 3.0 metres with some impact on surrounding vegetation;

- *Surface:* compacted limestone fines, minimum; recommended asphalt where significant user activity is anticipated; and

- *Grades:* 0 to 5% with maximum sustained grades less than 10%.

The design shall minimize blind corners, sudden grade changes or steep slopes terminating at a path or road intersections. This is intended to provide high levels of safety for cycling and in-line skating where higher speeds may occur.

Exhibit 6-8: Basic Multi-Use Trail Standards



6.9.5 TRAIL SELECTION, MAPPING AND FUNDING

Trail Selection Procedure - The following criteria are recommended to determine the suitability of a proposed trail to be included in the County of Brant trail system.

- Trails will be considered for inclusion upon submission of an official request to the County of Brant;

- Anyone or group may submit a request.

- Documented concurrence of the involved landowner(s) and/or managing agency(s) must be provided with each request.

- All requests will be reviewed by the County for general public safety, completeness and appropriateness. Based upon the recommendation of County staff, final approval of the

requested trail for inclusion in the County's trail system will be by the County of Brant Council.

- Submitted existing trails requests should show recent use as well as verified history of the route having been used by the public as a trail.

- Trails that connect with one of the following will be given strong consideration:

- Existing or proposed trails as already delineated on the County's trail maps;

- The preferred basic geometry of a trail should reflect the guidelines provided in Section 6.8.4 of this TMP.

- The terrain and/or topography for a trail should be suitable for trail purposes, either multi-use or specific. They may be of various degrees of difficulty. .

- Trails that provide an alternate means of transportation should be given strong consideration, as should trails located in floodplains, old railroad rights of way, and utility easements and on watercourses.

Trail Maps - The Trail Maps adopted by County Council should be the official documents outlining the County's Trail System. These maps should be maintained by the County and revised as directed by the County Council. These official Trail Maps should also be reflected on the Transportation Schedule of the County's Official Plan, and maps and brochures produced by the County of Brant Community Services Department, Parks & Recreation, economic development and tourism agencies and private organizations (i.e. GRCA, Brant Waterways Foundation).

Trails Amendments - The decision to amend the trail system and Trails maps should be based on one or more of the following criteria:

- Whether the subject trail or trail access serves as a link to a major nature preserve or waterway;

- Whether the subject trail or trail access is selected so as to minimize the impact on the environment; and/or whether the subject trail access is positioned in a way to minimize impacts upon adjacent structures and property owners;

- Whether the subject trail or trail access crosses roadways at grade separations or away from blind curves or stretches of road where visibility is obscured;

- Whether the subject trail or trail access is a significant scenic or historical route which serves as a link in the overall trail system;

- Whether the subject trail or trail access will require significant alteration or removal of existing vegetation; and/or,

- Whether the subject trail or trail access will pose significant design or safety problems or has experienced water level or related constraints.

Funding - County Council may set up a separate account to accept donations, grants or any funds to be used exclusively for the acquisition, development, preservation and maintenance of the County's trail system. County Council may also consider the use of Ecological Land Donations, Job Creation Programs and other funding sources.

Trails that serve new development may also be funded by development charges. As new subdivisions are developed, additional charges/revenues may apply.

6.10 On-Road Cycling Strategy

The Transportation Association of Canada (TAC) Design Guide, in Chapter 3.4: Bikeways, provides design principles that apply to four functional classifications of on-road cycling facilities (refer to **Exhibit 6-9**):

- **Shared Roadway or Wide Curb Lane** – Cyclists share the roadway with other vehicles, usually on the right side of the travel lane. This type of bikeway, signed as a shared route, is suitable for utilitarian or recreational uses, but is most appropriate only on local urban or suburban roads where motor vehicle volumes and speeds are relatively low. See Exhibit 6.9 for typical bikeway selection criteria. As these volumes and speeds increase, the travel lane should be widened to a desired 4.5 m width to accommodate the safe passage of motor vehicles and bicycles without changing lanes.

- **Shoulder Bikeway** – A smooth paved shoulder on which cyclists are separated from the travel lane for motor vehicles. Shoulder bikeways typically have few conflicts and are present on roadways with fast moving motor vehicles traffic, making them more suitable for rural applications. In rural areas they can also include a rumble strip between the travel lane and paved shoulder as a warning to motorists to not encroach on the shoulder space.

- **Bike Lane –** Situated within roadways serving other vehicular traffic, but separated from adjacent travel lanes for motor vehicles, bike lanes are intended for the exclusive use of bicycles. Bike lanes are designated by either a painted line or raised delineator (e.g. posts, bollards), however the latter is not recommended due to safety concerns. Due to their exclusive use for cyclists, bike lanes are a safer alternative than a shared roadway and are often used on collectors and arterials (see Exhibit 6-**10**). The minimum bike lane width is 1.2 m from the face of curb, with 1.5 m preferred.

- **Bike Path –** Physically separated from the roadway, bike paths, sometimes called side paths, are for the exclusive use of cyclists, although they may be shared with pedestrians. Bike paths may be located within a road right of way or may follow a route not served by roads. Non-road corridors present an attractive opportunity for recreational cycling and sometimes provide a more direct route for commuters. Typical locations for bike paths are along rivers and creeks, waterfronts, utility rights of way, parks, within the right of way of major subdivision roads or along abandoned railway rights of way. In all cases, crossing of roadways is kept to a minimum. Also, due to safety and operational problems, the use of boulevards as bike paths should only be considered when no other routes are available.

Exhibit 6-9: Bikeway Types (TAC Design Guide, 1999)

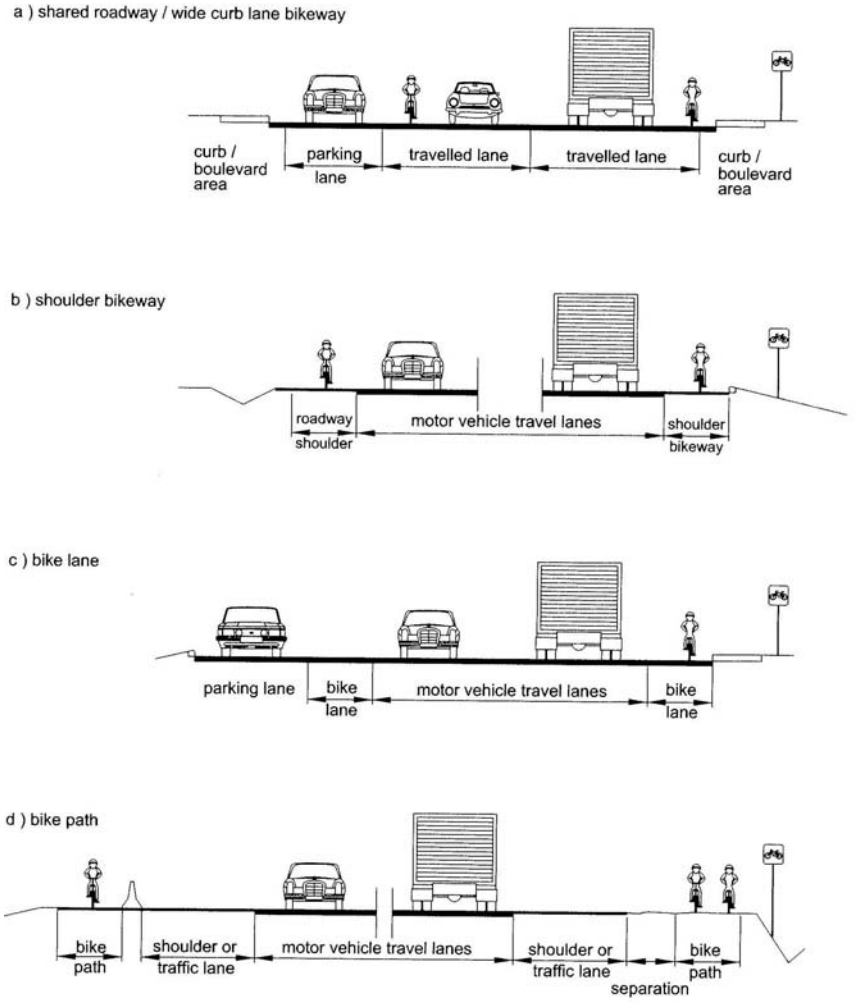


Exhibit 6-10: Bikeway Selection Criteria

Average Motor Vehicle Operating Speed (km/h)	Average Annual Daily Traffic Per Lane		
	<3,000 vpd/lane	**3,000-5,000 vpd/lane**	**>5,000 vpd/lane**
<50 km/h	Shared Roadway	Wide Curb Lane	N/A
50-60 km/h	Wide Curb Lane	Wide Curb Lane or Bike Lane	Wide Curb Lane or Bike Lane
60-70 km/h	Wide Curb Lane or Bike Lane	Bike Lane	Bike Lane
>70 km/h	N/A	Bike Lane	Bike Lane or Bike Path

Note: Where the choice is wide curb lane or bike lane, use the bike lane if there is a high volume of trucks (>10%) and/or on-street parking. These selection criteria are guidelines only.



Some municipalities will also consider the use of boulevard multi-use bike paths, or side paths where there is sufficient road right-of-way so that cyclists are kept off the road surface. Caution must be used in locating any side paths since traffic engineering and cycling data shows a high rate of cyclist/auto collisions where side paths are crossed by numerous driveways and side streets. On side paths, cyclists are required to yield to other vehicles at driveways and intersections, and when this does not happen, accidents result. This is different that cyclists sharing the road or in on-road bike lanes where they have the right-of-way, just like motor vehicles, when they intersect driveways and side streets. An important criteria in considering any sidepath application is that there should be no more than **three crossings** (driveways/intersections) per kilometre.

Side paths should not be used as a substitute for viable on-road facilities.

7. IMPLEMENTATION ACTION PLAN

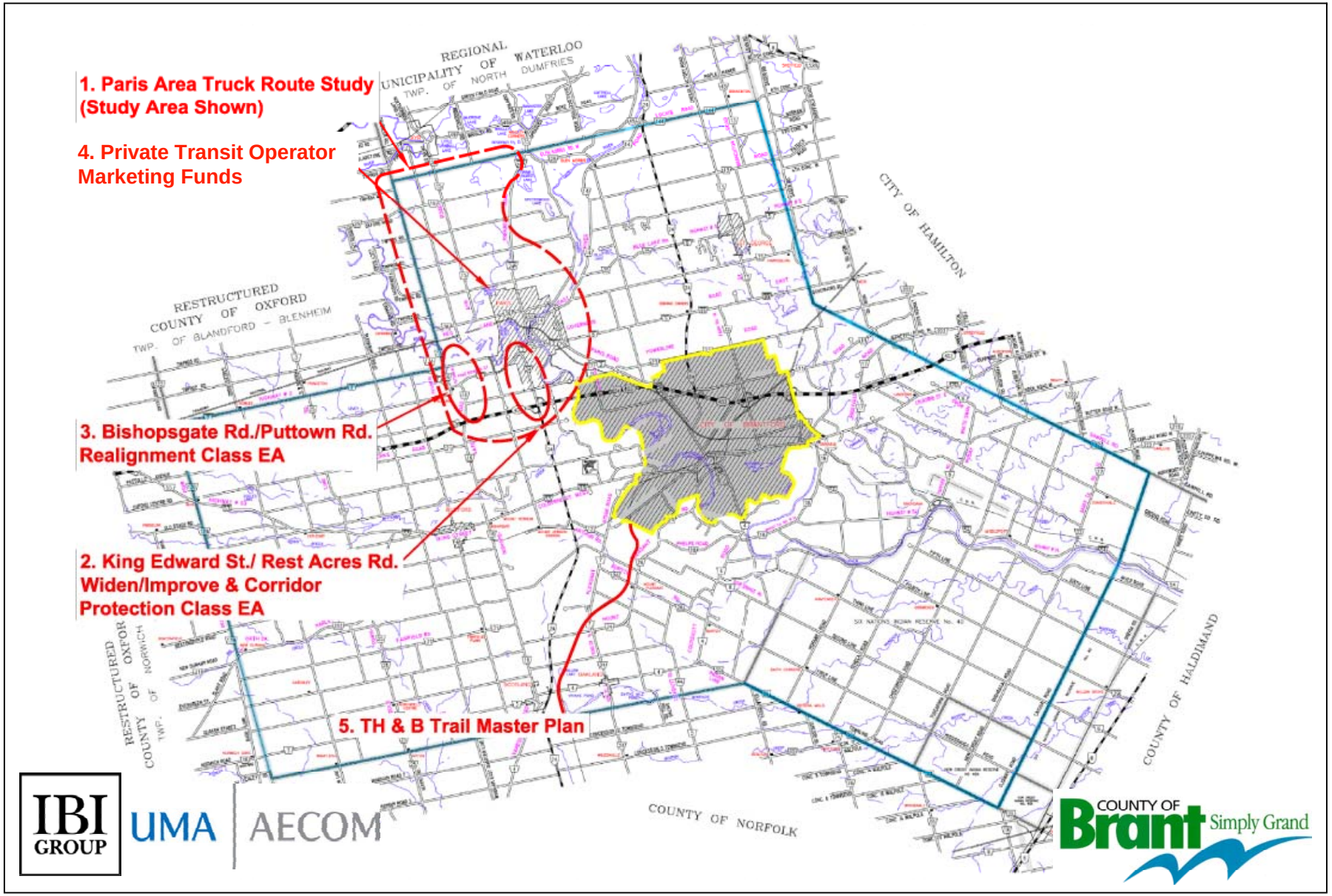
7.1 Project Priorities and Costs

7.1.1 SHORT TERM TO 2011

The strategic transportation improvement projects recommended in the County of Brant in the short term to 2011 are described as follows and shown on Exhibit 7-1:

Project Description	Estimated Capital Cost	Class EA Requirement
1. Complete a Paris Area Truck Route Study following on the work conducted in the 2004 Brant County Truck Route Study, to establish truck routes for a subsequent County Truck Route Bylaw (see Project #6)	$100,000	N/A
2. Complete a King Edward Street/Rest Acres Road Widening/Improvement and Corridor Protection Class EA from Church Street to Rest Acres Road, including an Intersection Control Study of potential improvements to the King Edward Street/Rest Acres Road intersection	$150,000	Conduct as a Schedule B or C Class EA
3. Complete Bishopsgate Road/Puttown Road Realignment Class EA between Highway 403 and Brant-Oxford Road	$150,000	Conduct as a Schedule C Class EA
4. Contribute funding to the marketing and promotion of a private operator Transit Service in association with matching funding from the City of Brantford	$10,000 annually x 3 = $30,000	NA
5. Staged implementation of the Master Plan and Implementation Strategy for the development of the Toronto, Hamilton and Brantford (TH&B) multi-use trail from Brantford south to the County of Norfolk (assuming the trail Master Plan has been completed)	$15,000 annually x 3 = $45,000	NA
TOTAL COST TO 2011	**$475,000**	

Exhibit 7-1: County Road Network Improvement Plan 2008-2011



7.1.2 MEDIUM TERM 2011 TO 2021

The strategic transportation improvement projects recommended in the County of Brant in the medium term from 2011 to 2021 are described as follows and shown on Exhibit 7-2:

Project Description	Estimated Capital Cost	Class EA Requirement
6. Implement a Truck Route Bylaw, including potential localized intersection, traffic management and link improvements where required, and therefore are expected to require Municipal Class EA approval.	$150,000	As Required
7. Construct widening of Rest Acres Road to 2 lanes/direction from King Edward Street to Highway 403 according to the approval under the Planning Act of the SW Paris Urban Expansion Area Secondary Plan, and including associated improvements to the King Edward Street/Rest Acres Road intersection and widening of King Edward Street between Church Street and Rest Acres Road (see Project #2)	2,750 m x $2,250/m* = $6.2 M	Approved Schedule B or C Class EA from Project #2 for Church St. and Rest Acres Rd., plus Secondary Plan Approval. MTO highways subject to MTO Class EA
8. Construct 1-lane/direction Bishopsgate Road/Puttown Road realignment between Highway 403 and Brant-Oxford Road according to the approved Class EA	2,000 m x $2,100/ m** = $4.2 M	Approved Schedule C Class EA from Project #3
9. Monitor ridership on a private operator transit service in the Paris area to determine if and when extension of scheduled transit service from Brantford to Paris is warranted and justified	NA	NA
10 Continued staged implementation of the TH&B Master Plan and Implementation Strategy, in association with involved agencies, to complete improvements and facility development along the entire trail length from Brantford to County of Norfolk	$15,000 annually for 5 years = $75,000	NA
11. Monitor traffic growth in the SW Brantford Area associated with development in the Shellard Lane and West Brant areas to determine impacts on Phelps Road, Brant County Road # 18, Mount Pleasant Road and Pleasant Ridge Road in the County. Monitoring will be directed at the roadway network impacts and benefits that are expected to evolve through the City's planned capacity enhancements in SW Brantford across the Grand River into the remainder of the City road network and links to Highway 403	NA	NA
12. Monitor Traffic Growth along Powerline Road from Oak Park Road to Park Road North for capacity enhancement and associated on-road bike lane requirements	NA	NA
TOTAL COST 2011-2021	**$10.6 M**	

***Note**: Conceptual cost estimates are based on $2250/m to widen a 2 lane rural road to a 4 lane urban road. This includes concrete sidewalks, and on-road bike lanes on each side of the road, street lighting, traffic signals as warranted, concrete curb and gutter, ROW drainage, asphalt and granulars, 13% engineering and 10% contingency. Land acquisition costs are not included.

****Note**: Conceptual cost estimates are based on $2100/m to build a new realigned 2 lane rural road. This includes concrete sidewalks, and on-road bike lanes on each side of the road, street lighting, traffic signals as warranted, concrete curb and gutter, ROW drainage, asphalt and granulars, 13% engineering and 10% contingency. Land acquisition costs are not included.

7.1.3 LONG TERM 2021 – 2031

The strategic transportation improvement projects recommended in the County of Brant in the long term from 2021 to 2031 are described as follows and shown on Exhibit 7-3:

Project Description	Estimated Capital Cost	Class EA Requirement
13. Construct new interchange at Bishopsgate Road and Highway 403 (assuming the existing flyover would have to be reconstructed for widening)[19]	$17 M ***	Municipal Class and MTO EA required
14. Widen Highway 24 to 2 lanes/direction between Highway 403 and Bethel Road	750 m x $2,250/m = $1.7 M	MTO Class EA
15. Widen the realigned Bishopsgate Road to 2 lanes/direction between new Highway 403 interchange and King Edward Street/County Highway 2	1,800 m x $2,400/m = $4.3 M ****	Based on approved Schedule C EA from Project #3 and realignment construction from Project #8
TOTAL COST 2021-2031	**$23 M**	
TOTAL COST 2008 – 2031	**$34 M ($1.5 M/year)**	

*****Note:** cost per directional ramp - $2M x 2
cost per loop ramp - $1.5M x 2
cost for new structure (20m wide x 60m long x $3500/m2) = $4.2M
cost for new roadway (likely wider and higher in order to provide falsework along the highway) - $3M
demolition, Utilities and Misc - $3M

******Note**: Conceptual cost estimates are based on $2100/m to widen a 2 lane rural road to a 4 lane urban road. This includes concrete sidewalks, and on-road bike lanes on each side of the road, street lighting, traffic signals as warranted, concrete curb and gutter, ROW drainage, asphalt and granulars, 13% engineering and 10% contingency. Land acquisition costs are not included.

[19] a flyover is a grade-separated bridge crossing of a freeway with no connection to the freeway

Exhibit 7-2: County Road Network Improvement Plan 2011-2021

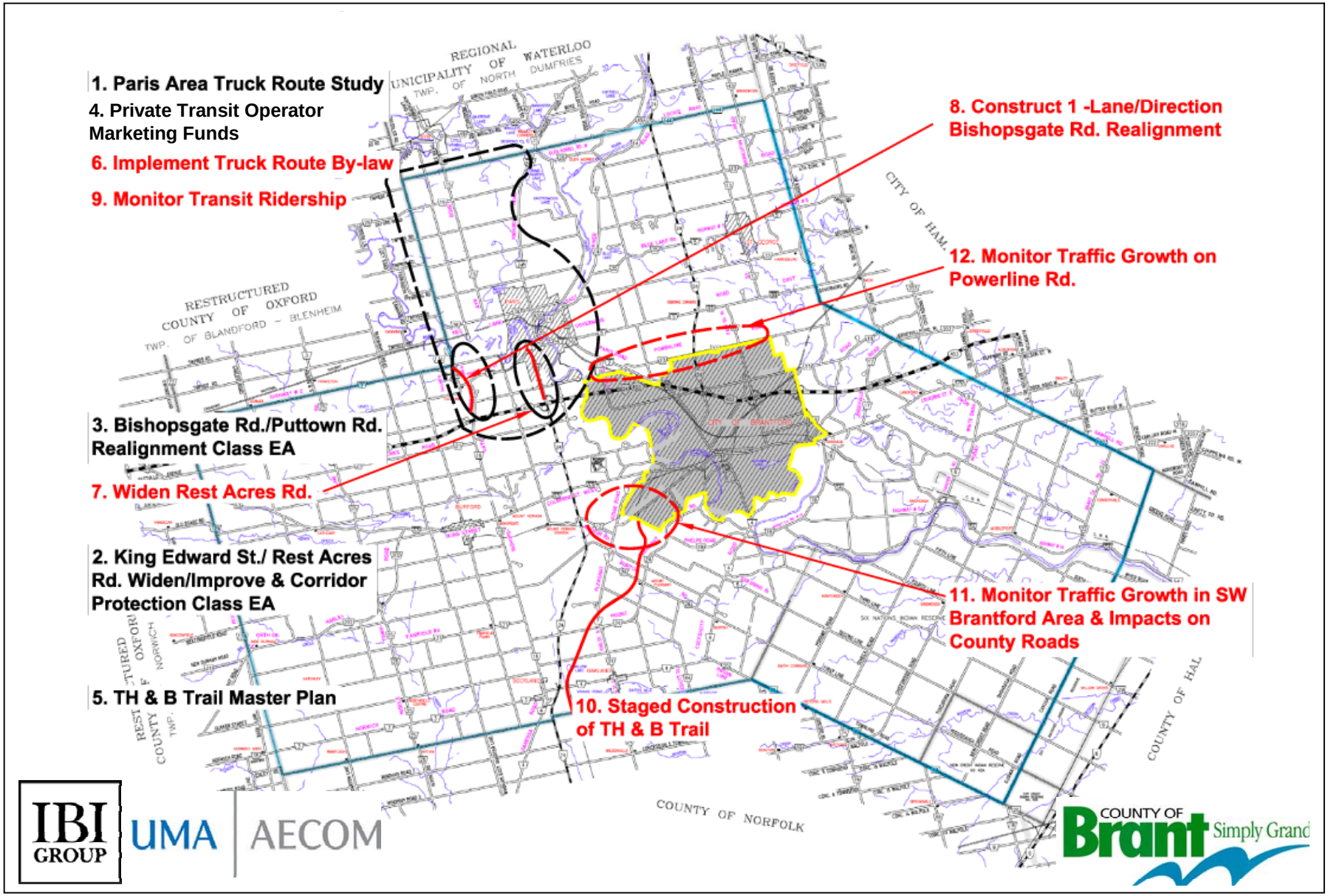
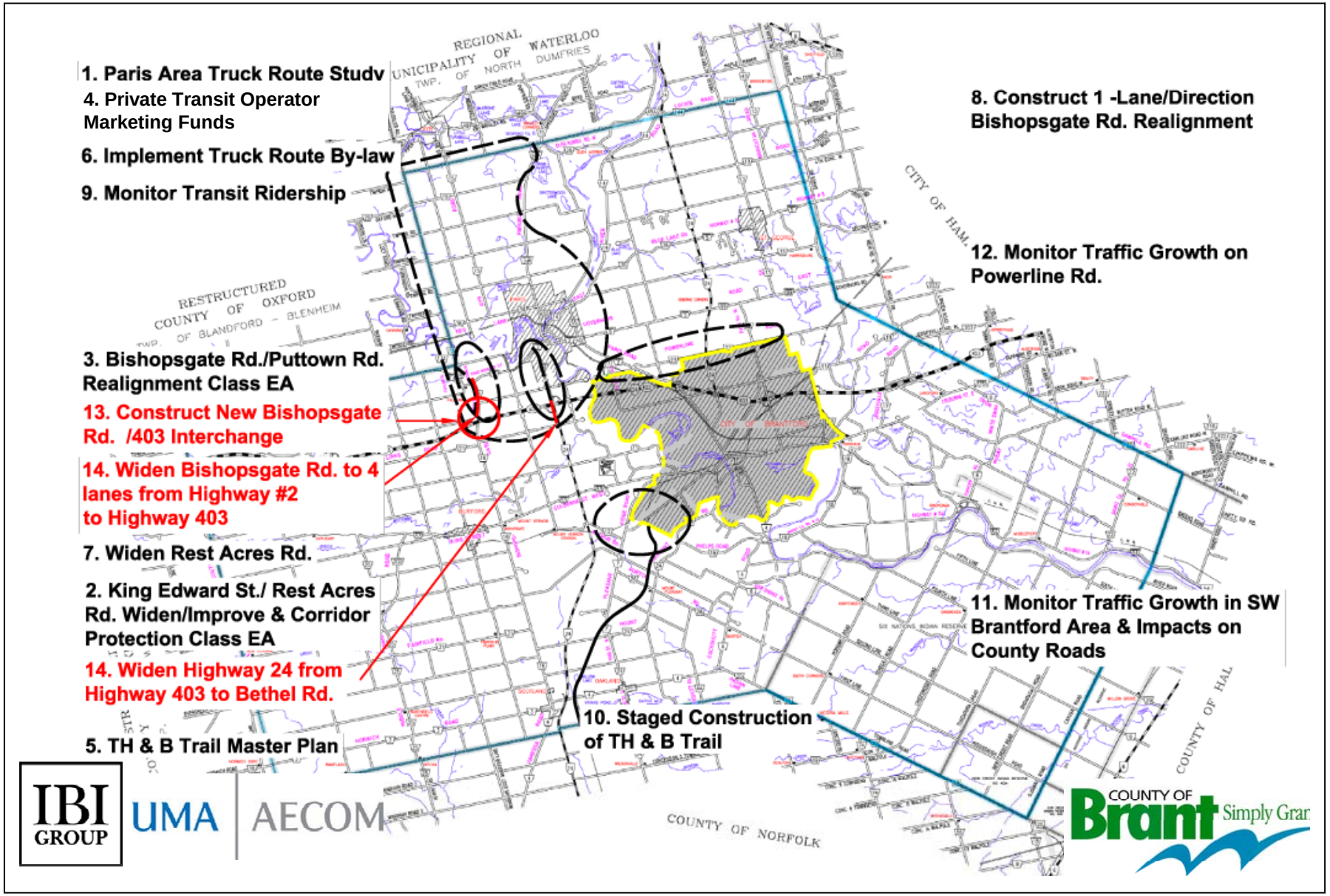


Exhibit 7-3: County Road Network Improvement Plan 2021-2031



7.2 Official Plan Integration

The recommendations of this CBTMP should be incorporated into the County of Brant Official Plan as the statutory basis on which to implement the TMP recommendations. There are also a number of guidelines and policy recommendations made in this TMP regarding Transportation Demand Management through land use planning, urban form and transportation/land use integration. The County should determine where and how to incorporate this information into the Official Plan, where required to improve the transportation/land use relationship in the County over the next 25 years.

Specific policies recommended for inclusion in the Official Plan are:

County Transportation Goal – The goal presented in Section 1.4.1 to develop a new comprehensive Transportation Master Plan for the County of Brant that recommends policies, guidelines and an implementation strategy that will assist the County in addressing major transportation issues over the next 25 years should be included in the Official Plan as along term County need.

County Transportation Objectives - The objectives of CBTMP set out in Section 1.4.2 should be incorporated into the Official Plan.

Transportation Planning Principles – Transportation planning principles needed to support and implement the Towards Sustainability transportation strategy set out in this TMP should be incorporated into the Official Plan as follows:

Principle #1: Optimize Arterial Roadway Network Capacity – County residents want a safe, convenient and effective transportation system. The County of Brant has a responsibility to provide a functional transportation system with an appropriate Level-of-Service (LOS) for the safe and efficient movement of people and goods.

In response, and where appropriate in the County, priority should be placed on optimizing the carrying capacity of the existing arterial roadway network within the urban and rural areas before investing in new major capital improvements such as road widenings, extensions and new roads. Arterial optimization will focus primarily on access management and corridor protection (see Section 6.9) and traffic management (see Section 7.5) along the County's arterial roads through regulation and control of vehicular access, building locations, land use types, turning movements, side road access and driveway access.

Principle #2: Select Appropriate Levels of Service and Standards – Before making major roadway network improvements, the road or roads in question should be analyzed to determine the appropriate Level-Of-Service and design standards that match the need and character of the area being served. This principle is required in a mixed urban/rural region such as the County of Brant because the Level-of-Service expected on urban and rural character can be extremely different, as described in Section 6.2 of this TMP.

Principle #3: Ensure Transportation Improvement Affordability – The ability of the County to fund major transportation projects over the next 25 years may be limited by funding limitations and competing needs. This being the case, transportation planning may have to consider the implications of reduced investment scenarios on the level of transportation service, as measured by criteria such as travel time and Level-of-Service changes. The TMP must prioritize recommended system improvements, including structural, operational and TDM measures, in order to respond to funding limitations or targets.

Principle #4: Ensure Transportation System Sustainability **–** To sustain the existing transportation system in the County of Brant, decisions should be made using integrated transportation/land use planning, including application of the transportation-oriented subdivision design guidelines outlined in Section 7.6 of this TMP. This approach responds to the *Smart Growth* and *Places To Grow* approaches to land use and density distribution, using re-urbanization and intensification in appropriate areas to reduce the impacts of urban growth on the roadway network. In the County, this principle could extend so far as to allow urban development only where and when adequate transportation services and capacities are made or can be made available. This principle can be accomplished through a balance of roadway capacity optimization and enhancement that provide for high connectivity and travel efficiency throughout the County, coupled with demand management measures that encourage more sustainable travel characteristics by County residents (i.e. alternative modes, travel times and home-work proximity) and a closer home-work relationship (i.e. through more mixed use and intensified development forms). This principle is a primary element of the Towards Sustainability strategic approach recommended by the TMP.

County Road Classification System – The Transportation Schedule of the County's Official Plan should be amended to reflect the expanded roadway classification system recommended in Section 6.2 of this TMP. Incorporating these new classifications will help ensure that all County roads are maintained with standards and practices appropriate to their function in the County's road network.

Roadway Level of Service (LOS) - Any reference to Level-of-Service (LOS) standards in the Official Plan and any Municipal Class EA road improvement studies should state that the County of Brant endeavours to maintain at least LOS D conditions on all County roads in the PM Peak Hour. Once this LOS is measured or forecast to exceed LOS D on a road section or intersection in the County, this can constitute a "Problem" as defined by Phase 1 of the Municipal Class EA process, and Plan and actions may be taken to regain the minimum LOS D planning standard.

Transportation Corridor Protection - The County of Brant should review the Official Plan to ensure they include sufficient policy directions to protect the long term operational effectiveness of the County road network and connections to provincial highways. These corridors must be protected from land use forms, access and encroachment that would restrict or constrain County road operations, as well as provincial highway operations. Such encroachments can range from parcel severances, property rezoning applications and Official Plan amendment applications, through to Draft Plans of Subdivision and development permit applications.

It is also recognized that there must be appropriate consultation through legislated implementation measures, most notably the Class EA process and the Official Plan amendment process, to ensure protection of some of the specific works recommended for the County road network in Section 7.1 of this TMP involving long term road widening protection (i.e. Rest Acres Road, Bishopsgate Road).

Public Transit - The ability to enhance and expand public transit service in the County will evolve and vary over time in response to urban expansion. The Official Plan should include a supportive statement or policy on the role of public transit in the County as part of the Towards Sustainability transportation strategy, including the provision of a private operator transit service in the Paris community, and/or extension of Brantford Transit service into appropriate service areas of the County in association with the supporting recommendation made in the City's TMP. The Official Plan should also include a policy supporting the provision of Alternative Service Delivery Methods (i.e. Dial-A-Bus, TransCab) and "Community Transportation" services in the County as alternative ways of providing transit service.

Commercial Goods Movement and Truck Routes – While there is a need to coordinate goods movement and truck route management with the neighbouring municipalities, it is the responsibility

of the County to plan for and manage the movement of trucks on County of Brant roads. As a result, it is recommended that the existing Official Plan policy statement on truck routes stating that ""*the need for a designated truck route is a multi-regional issue that cannot be resolved at the local level"* be reviewed with the objective of creating a "County-own" commercial goods movement policy in the Official Plan based on the recommendations in Section 6.7.2 of the TMP. This includes the development of a Strategic Truck Route Network that can form part of the new Official Plan policy, and/or be referred to as part of a new truck route bylaw for the County.

7.3 Plan Monitoring and Updating

The CBTMP is not a static document. It must be regularly reviewed to ensure it meets the transportation needs of the County of Brant and the local municipalities. Changing growth and development patterns may also require a re-investigation of the Plan's Road Network Improvement Plan (Exhibit 6-4) and Towards Mobility strategic direction. Both should be reviewed by municipal staff annually to determine changes in travel patterns and associated travel characteristics in the County. This should be done as follows.

A coordinated report on County transportation conditions, patterns, needs and trends should be submitted annually to the County of Brant Council or appropriate Committee with input from:

- County Public Works Department;
- County Development Services Department;
- County Community Services Department;
- County Fire Services;
- Private Transportation Operators;
- City of Brantford Engineering Department;
- Ontario Provincial Police; and
- Ontario Ministry of Transportation.

To address transportation issues on an annual and consistent basis, this "State of the Transportation System" report should document:

- results of annual or regular traffic count programs including comparisons with previous counts;
- new trends and technologies in traffic operations and management;
- use of warrants and access management decisions for arterial capacity optimization;
- opportunities for transit service improvement;
- a traffic safety and emergency response deficiencies;
- progress of multi-use trail development;
- public and private sector initiatives as part of TDM initiatives (i.e. car pooling, guaranteed ride home programs, preferential parking, , flexible work hours, telecommuting, cycling facilities);

- status of related Provincial Highway initiatives, policies and funding programs, and;
- the need to re-assess, amend or update components of the County of Brant Transportation Master Plan.

The CBTMP also requires regular updating to remain relevant and effective in dealing with local transportation needs in the County. It is recommended that the Plan undergo a full review and update every five years, ideally at the same time as the County carries out its mandatory Official Plan review if possible. This CBTMP used 2001 census Place of Work data to establish basic travel behaviours in the County in terms of commuting patterns and mode of travel, as reported in Section 2.1.2 of this TMP. Updated census data should be collected every five years on the following key temporal trip-making characteristics to add to the TMP updates in order to gauge changes in County and regional travel characteristics, and to measure to what degree the strategic directions and targets of the CBTMP are being met:

- Travel Mode
- Travel Origin and Destination
- Trip Purpose
- Trip Time
- Vehicle Occupancy

The potential impacts on the County's road network resulting from development by MTO of a new Highway 401/Highway 403 connection, as currently being studied in the Brantford to Cambridge Transportation Corridor EA, will be significant. Therefore, if MTO does not construct approved improvements upon completion of the EA Study, the County of Brant may be required to investigate transportation needs on County roads associated with existing Highway 24 traffic growth. Similarly, the transportation development strategy in the MTO EA could include provincial and municipal road and transit infrastructure. The potential impact of this strategy could be significant, and the County of Brant may still be required to investigate transportation needs on County roads.

7.4 Financing Opportunities

The County of Brant has been aware of and eligible for various provincial and federal funding programs that have been made available over the past five years to assist in the funding of County road network improvement projects. This involves the following programs, some of which are now closed to further funding applications.

- Ontario Small Town and Rural (OSTAR) Development Infrastructure;
- Ontario Municipal Economic Infrastructure Financing Authority (OMEIFA);
- Municipal Rural Infrastructure Fund (MRIF – Federal);
- Canada Strategic Infrastructure Fund (CSIF);
- Infrastructure Canada Program (ICP); and
- The Strategic Highway Infrastructure Program (SHIP – Federal).

While it is recommended that the County continue to monitor changes in existing funding programs and introduction of new programs, the most reliable and consistent sources of funding for the

planning and implementation of transportation system changes in the County are Development Charges and the municipal tax levy.

The central issue in determining a fair and equitable funding mechanism in the County of Brant is the extent to which the transportation services are to the benefit of the existing community (non-growth related) or growth-related. Provincial legislation (The Development Charges Act, 1997) allows for the imposition of a development charge to offset the cost of growth-related services in regard to roads and other hard services, as well as soft services provided by the County. In response, the County's Development Charges Bylaw 170-04 establishes the schedule of DC charges shown in Exhibit 7-4, and it is expected that this schedule will be updated upon completion of the Official Plan review and resulting review of the DC Bylaw to reflect new differentiation between non-growth and growth-related transportation costs.

Exhibit 7-4: County of Brant Development Charges Bylaw 170-04 Charges

SCHEDULE "B"

SCHEDULE OF DEVELOPMENT CHARGES

Service	Per Residential Dwelling Unit				Non-Residential per sq. m of GFA
	Single, Semi-Detached	2 Bedroom and Larger Apartments	Bachelor and 1 Bedroom Apartments	Other Multiples	
General Government (Studie	$111	$53	$39	$77	$0.63
Roads and Related Service (plus Public Works)	$832	$403	$295	$580	$6.89
Fire Protection	$152	$74	$54	$106	$0.85
Ambulance (Emergency Services)	$33	$16	$12	$23	$0.07
Parks and Recreation	$1,411	$683	$501	$984	$1.25
Library	$266	$129	$94	$185	$0.24
Public Works	$195	$94	$69	$136	$1.59
County-wide Sub-total	$3,000	$1,452	$1,064	$2,091	$11.52
Sanitary Sewer [1]	$2,384	$1,154	$846	$1,661	$2.30
Water [1]	$2,509	$1,214	$890	$1,748	$2.90
Total	$7,893	$3,820	$2,800	$5,500	$16.72

[1] Development charge imposed only where such service is available to development

7.5 Traffic Management

7.5.1 TRAFFIC CONTROL WARRANTS

The driving, cycling and walking tasks require constant assessment and reassessment of the travelling environment and response to potential conflicts and conditions. A road user's reaction to "unexpected" events or situations is generally slower and thus provides them with less time to recognize the eminent decision and to properly react to it. The uniform application of traffic and pedestrian control devices (hereafter, collectively referred to as traffic control devices) simplifies road user tasks as it aids in the timely recognition and understanding of the situation.

Accordingly, standards and guidelines have been developed to provide uniform implementation and application of traffic control devices. The Manual of Uniform Traffic Control Devices for Canada (Canadian MUTCD) provides standards and guidelines concerning the design and use of traffic control devices, including signs, markings and devices. The use of a "standard" traffic control device or sign does not by itself constitute uniformity or a typical installation. In fact, a standard device used in an inappropriate application or location may cause confusion among the various road users, contribute to poor decisions and increase conflict potential.

Warrants have been created on a national, provincial and/or jurisdictional level for specific traffic management devices such as:

- traffic signals
- all-way stops
- marked and unmarked crosswalks
- speed limit signs
- traffic calming devices.

Historically, warrants were minimum criteria that needed to be met before a specific traffic control or roadway device would be installed. Today, a warrant provides qualitative and quantitative threshold conditions to transportation professionals to evaluate the potential operational or safety benefits (and impacts) of traffic control devices, based on average conditions.

Warrants assist in determining the need for a particular control device to guide:

- **Logical and Consistent Application** - the best means to achieve effective and safe traffic and pedestrian control is through the uniform application of realistic policies and standards within a municipality, region and/or province;
- **Priority Installations** – As with other infrastructure and capital improvements, the available funding for traffic control devices is limited. For more costly devices such as traffic control signals and pedestrian signals, a jurisdiction may need to prioritize their installation based on available capital funds, staff resources and on-going maintenance resources. The County can make use of traffic control warrants to determine potential needs and responsibilities for overall growth. Distinguishing between warranted and unwarranted traffic control devices is an additional tool in these decision processes; and

- **Funding Responsibilities** – There are many circumstances where changes in land use, access or the area road network will change traffic or pedestrian volumes at a particular location, thus creating a warranted traffic control device. The County can make use of traffic control warrants to determine potential needs and responsibilities.

It is important to stress that regardless of the location, the best means to achieve effective and safe traffic control is through the uniform application of realistic policies and standards within a municipality. Warrants for traffic control devices assist in attaining these goals.

As part of this TMP preparation, a **Traffic Warrant Policy Paper** was prepared by IBI Group in May 2007. It concluded that the County's existing warrants appear to represent fair and consistent guidelines for traffic control device application. The County should monitor any developments in the area of traffic control warrants, to determine the need to update their policies based on any future research.

It is also recognized that warrants are established to apply to "typical" or "normal" roadway, intersection or road user operating conditions. There may be instances the warrants are not met and where engineering judgement must prevail due to special circumstances or site-specific conditions. These may include, but not be limited to, situations where:

- Atypical physical or operational road or pedestrian network characteristics exist;
- Positive guidance from human factors considerations prevails over the standard warranting procedures from a road user safety perspective; and
- Road users in the area have special needs, i.e., older pedestrians, cyclists or motorists, young pedestrians or cyclists or pedestrians will visual or hearing impairments.

The **Traffic Warrant Policy Paper** recommends that the County maintain their existing traffic control device warrants. By maintaining and supporting the County's existing traffic control device warrants, the following benefits may be realized:

- Provide a relatively consistent application of traffic control;
- Establish priority funding of traffic control devices in a fair and logical approach;
- Reduce cases where traffic control is excessive, which causes additional person-delay and emissions;
- Reduce the potential for road user apathy and non-compliance, which may lead to an increase in collision potential;
- Facilitates the ability to effectively regulate and enforce traffic regulations and by-laws; and
- Provide the development community with a benchmark for establishing appropriate traffic control devices related to their development proposal impact.

In terms of implementing this directive, it is recommended that County staff continue to provide advice and documentation to Council on the appropriateness of proposed traffic control devices and that the impacts of varying from approved warrants be clearly documented.

In addition, the County should pursue opportunities to educate the public with regards to proper transportation control applications and the reasons behind the warrants that they have established.

The County's existing web site can include valuable resource information relating to various transportation matters such as a Speed Watch Program, truck routes, the bicycle network, etc. The County's web site and public correspondence (i.e., public information centres, responses to resident inquiries) are good opportunities to provide the general information to inform residents of the rationale behind their warranting procedures.

7.5.2 POTENTIAL USE OF ROUNDABOUTS

As part of this TMP preparation, a set of **Guidelines for the Use of Modern Roundabouts** was prepared by IBI Group for the County of Brant on the use of modern roundabouts, and excerpts of this work are provided as follows.[20]

The modern roundabout is an unsignalized intersection in which traffic moves around a central island in a one-way direction. Roundabouts are engineered to offer several potential advantages over signalized and stop controlled intersections, including improved safety performance, less delay, shorter queues (particularly during lower volume periods), reduced speeds, and improved aesthetics for community enhancement. In some applications, roundabouts can avoid or prolong the need for expensive widening of an intersection approach that would otherwise be necessary under traffic signal control.

Modern Roundabouts are designed with a single lane, two lanes or three lanes depending on the traffic and turning movement volume being experienced or forecast at a particular intersection. The examples shown here are Modern Roundabouts from the Regional Municipality of Waterloo.



The feasibility and benefit of providing a modern roundabout should be determined through an Intersection Traffic Control Study. An intersection traffic control study includes a review of the reasonable forms of traffic control for a particular location or corridor and would include, but not be limited to, the following primary measures:

- Road user safety for all potential users including a detailed review of the societal costs of collision potential;
- Level of service and delay for all potential users;
- Environmental impacts such as fuel consumption, vehicle emissions and noise;

[20] Guidelines For The Use of Modern Roundabouts, IBI Group, May 2008

- Capital and operating costs;
- Compatibility with road/corridor traffic control strategies, adjacent land use and access;
- Property impacts; and
- Effects on transit operations, emergency service provision, accommodation of persons with disabilities and farm vehicle operations.

The installation of a traffic roundabout is beneficial only if an environment is appropriate for its use. This is an important aspect of the planning process since placing a roundabout in an inappropriate location may not help its cause and may lead to adverse effects. Roundabouts should be constructed for the primary purpose of improving operations and/or safety at intersections, but they may also be considered for traffic calming or aesthetic reasons.

The following locations are generally mentioned as being unfavourable for roundabouts:

- Locations where there is insufficient space for an acceptable outside diameter. Single-lane roundabouts generally consume more space than equivalent signalized intersections at the junction itself, but their approaches are often narrower. Multi-lane roundabouts compare more favourably in terms of space consumption;
- Locations where it would be difficult to provide a flat plateau for the roundabout. Most guides recommend maximum grades of 3% to 5% depending on design speed;
- Locations within a coordinated signal network, where the roundabout would disrupt the progression of traffic (called platooning); and/or
- Locations with heavy flows on the major road and low flows on the minor road, where the equal opportunity treatment of the approaches causes undue delays to the major road.

Other site-specific conditions can be potentially problematic at roundabouts, but, as with any other intersection, these conditions can be addressed with special attention to design and operational aspects. Such conditions include the following:

- High volumes of cyclists, pedestrians or heavy vehicles, including large farm vehicles that may not be able to negotiate a roundabout safely, although in rural settings there is usually sufficient space to provide a large diameter roundabout design;
- Presence of numerous disabled and visually impaired users;
- Along emergency services primary response routes;
- Close proximity to at-grade rail crossings;
- Intersections at the top or bottom of a grade where adequate sight distance is a concern; and/or
- Proximity of adjacent downstream signals and potential blocking due to queuing.

A brief summary of features and expected operations for each of these basic roundabout categories is shown in Exhibit 7.5.

Exhibit 7-5: Basic Characteristics of Roundabout Categories (Adapted from FHWA, 2000)

Design Element	Urban Compact	Urban Single-Lane	Urban Double-Lane	Rural Single-Lane	Rural Double-Lane
Recommended Max. Entry Speed	25 km/h	35 km/h	40 km/h	40 km/h	50 km/h
Max number of entering lanes per approach	1	1	2	1	2
Typical inscribed circle diameter	25 m – 30 m	30 m – 40 m	45 m – 55 m	35 m – 40 m	55 m – 60 m
Splitter island treatment	Raised, with crosswalk cut	Raised, with crosswalk cut	Raised, with crosswalk cut	Raised and extended, with crosswalk cut.	Raised and extended, with crosswalk cut.
Typical daily service volumes on 4-leg roundabout (vpd)	15,000	20,000	Requires detailed site-specific analysis	20,000	Requires detailed site-specific analysis

Refer to the **Guidelines For The Use of Modern Roundabouts** prepared for the County of Brant for more information on roundabout location, design and operation.

7.5.3 REQUIREMENTS FOR TRANSPORTATION IMPACT STUDIES

As part of this TMP project, IBI Group prepared **Transportation Impact Study Guidelines** for the County of Brant. The guidelines provide valuable information and analysis for governing agencies and others who review development and redevelopment proposals. The County of Brant Transportation Impact Study Guidelines have been compiled to outline the process and structure required to produce a comprehensive transportation impact assessment for a development or redevelopment proposal in the County. A transportation impact study includes explicit consideration of all modes of travel including automobiles, trucks, transit vehicles, cyclists and pedestrians.

The main purpose of a TIS is to demonstrate that the transportation impacts of a proposed development or redevelopment will be manageable and that the transportation aspects of the proposal are consistent with the objectives of the County of Brant. The TIS also provides the basis for the identification and evaluation of transportation related improvements or measures to be included as conditions of approval for the development or redevelopment application. Hereafter, all references to the terms “development” or “development proposal” will be equally applicable to redevelopment applications/proposals.

Through the TIS, the proponent must demonstrate that the application or proposal meets the following County objectives:

- That there is sufficient arterial road network capacity to accommodate the proposed development, taking into account transportation system improvements and any travel demand management initiatives which will be secured in conjunction with the proposal;

- That the development must be phased, if necessary, in conjunction with the implementation of transportation system and service improvements and any travel demand management initiatives, to ensure that supply and demand are balanced over time;

- That the proposal incorporate a suitable travel demand management strategy which includes all reasonable measures to facilitate and promote cycling and walking for trips to and from the site, and future potential transit service; and

- That the number of vehicular parking spaces provided in conjunction with the proposal be minimized, with consideration given to short and long term parking demands, special needs parking and commercial vehicle loading facilities.

In some cases the trip generation potential from a development proposal may be insignificant when considered in isolation; however, the cumulative effects of a number of such proposals in one area may, in combination, require transportation improvements. It is for this reason, that the County may request the preparation of a transportation impact statement to ensure that the land uses and trip generation potential of these smaller proposals can be collectively accounted for in overall planning initiatives.

Applicability

It should be recognized that the TIS Guidelines prepared for the County are relevant at the time of preparation. These guidelines will be revised, as necessary, to reflect current County policy, practice and accepted standards. The proponent shall contact the County of Brant – Public Works Department to obtain any updates since this compilation date.

The TIS Guidelines outline general guidelines for the preparation of transportation impact studies for submission to the County. There may be instances where the guidelines and general study assumptions may not be applicable to certain locations in the County, or specific types of developments. It should be recognized that the purpose of this document is to provide a framework for the preparation of a TIS and shall not be substituted for good transportation engineering judgement.

Acknowledgement of Responsibility

When the scale of a development requires a TIS, it is the Proponent's responsibility to retain an experienced transportation consultant to complete the assessment. The County of Brant requires that a TIS be prepared and/or reviewed by a qualified firm/individual. The individual taking responsibility for the Proponent's TIS work must be a registered Professional Engineer with more than five years of applicable experience in the preparation of transportation impact studies.

Included in the TIS Guidelines is a Project Record that must be submitted with all TIS reports and addendums, including the stamp of the professional engineer taking responsibility for the work. In completing this form, the engineer is verifying that appropriate assumptions and methodologies have been used in the completion of the TIS and is indicating the individual(s) who are taking corporate/professional responsibility for the work. This information will also assist County staff in contacting the appropriate individual if clarification of any part of the transportation impact assessment is required during the review process, or at some time in the future.

TIS Requirements and Scope

There are a number of considerations in determining the need, elements and level of detail for a TIS. Generally a TIS may be required when one or more of the following are anticipated/present:

- The development proposal will add more than 100 peak-hour vehicle trips to the transportation system;

- The development is planned with an access to an arterial roadway within 200 meters of a signalized intersection;

- The development is located in an area of high roadway congestion, high operating speeds, and limited sight distance where safety is an issue;
- If in the opinion of the County the development has the potential to create unacceptable adverse operational and safety impacts on the area road network;
- The development, its access, or type of operation, is not envisaged by local land-use or transportation Plan;
- The development requires a change or an exception to a County planning or by-law policy, strategy or plan, including rezoning;
- The development is a large recreation or entertainment facility, or is in the vicinity of one, that would likely serve as a regional attraction; and/or
- If in the opinion of the County the previous TIS prepared for the same site is outdated.

The above criteria are necessarily general and in view of the lack of definitive criteria to establish the need for and scope of a TIS for a particular proposal, the Proponent shall consult with County Staff, to determine site specific TIS requirements.

The level of detail and the required components of the TIS will be a function of the location, size and operations of the development proposal. Included in Exhibit 7-6 is a summary of the points in the development approval process where a TIS may be requested and its overall objectives.

In some cases, the size, location and nature of the proposal will be such that a detailed transportation impact study is not required. Through discussions with County staff, the proponent may be required to prepare a more basic Transportation Impact Statement, which would outline the general characteristics of the site, its operation and trip generation potential, and a high level assessment of traffic impact, access, safety and parking requirements. The Transportation Impact Statement would be a technical letter, stamped by a Professional Engineer specializing in transportation planning, which outlines the required components agreed upon with the County.

The proposed development may lie within an area for which a recent and relevant Secondary Plan has already been completed. Under this scenario, the County shall determine if certain elements of the TIS can be omitted or directly incorporated into the current TIS work, i.e., background growth potential, identified arterial road improvements, etc.

Exhibit 7-6: General TIS Scope

Stage of Approval	General Transportation Impact Study Scope
Secondary Plan/Area Plan	• Identification of major/arterial transportation infrastructure and operational improvements associated with area wide development potential • Determination of the collector roadway network and the major intersection configurations and type of control
Draft Plan of Subdivision	• Arterial and collector roadway requirements and operations • Phasing plan • General description of access locations and operations • Allocation of responsibility for implementation of transportation infrastructure improvements

Stage of Approval	General Transportation Impact Study Scope
Rezoning	• Arterial and collector roadway requirements and operations • Phasing plan • Transportation infrastructure improvements tied to phasing plan • Description of access locations and operations
Site Plan	• Access location and operations • Transportation infrastructure improvements tied to phasing plan • Site specific impacts on road network including adjacent site operations

Included in Exhibit 7-7 is an indication of the components that the County of Brant will require at the various points in the development process. The proponent is to review the TIS requirements included in the column representing their specific point in the development process and discuss relevancy with County of Brant Staff.

The onus will be on the Proponent to demonstrate that certain aspects of the general requirements for a TIS are not required based on the point in the approval process, or availability and content of recent studies. The proponent should discuss the study scope before initiating the study.

Exhibit 7-7: Specific TIS Elements

TIS Component	Site Development Process			
	Secondary Plan/Area Plan	Draft Plan of Subdivision	Rezoning	Site Planning
Transportation Network				
Major transportation improvements • Planned roadways • New interchange/intersection • Road widening • New transit routes/services • Pedestrian and bicycle routes	√	√	√	
Local transportation system improvements • Intersection improvements • Traffic signal installation or modifications • Traffic calming Plan		√	√	√
Long range transit route and facilities planning	√	√		
Travel Demand Analysis				
Development potential beyond the study area	√	√	√	√
Site specific travel demand from other approved developments within study area			√	√
Project specific travel demands and assignments		√	√	√
Area wide transit demands	√	√		
TDM measures (where applicable)	√	√	√	√

TIS Component	Site Development Process			
	Secondary Plan/Area Plan	Draft Plan of Subdivision	Rezoning	Site Planning
Transportation Analysis				
Arterial road link capacity, intersection location, configuration and control	√	√	√	√
Traffic control, lane requirements and operations at collector and local road intersections	√	√	√	√
Storage lengths and tapers for auxiliary lanes at all intersections		√	√	√
Impact on movement of farm machinery	√	√		
Transit route planning	√	√		
Bicycle route planning	√	√		
Off-site pedestrian facilities		√		√
On-street parking requirements/provisions		√	√	√
Driveway access and operations			√	√
Traffic infiltration potential	√	√	√	√
Traffic management plan	√	√		
Site Operations				
Driveway access design and operations including sight distances and corner clearances			√	√
On-site pedestrian/bicycle facilities and operations				√
On-site traffic calming elements				√
Parking and loading layout and design				√
Parking supply			√	√
Improvements and Funding				
Identification of major transportation infrastructure improvements	√	√	√	√
Site phasing and required improvements	√	√	√	√

Having established the TIS scope, the remainder of the **TIS Guidelines** document, including the appendices, outlines the acceptable methodologies for which to document the required components.

7.5.4 TRANSPORTATION NOISE ATTENUATION

Although not identified as a major transportation issue in the preparation of this TMP, noise impacts associated with transportation-related traffic is often dealt with in urban areas through the application of noise attenuation policies. In the County of Brant, these attenuation policies are recommended for application in four types of conditions:

1. Noise Attenuation with no associated road works;
2. Noise Attenuation associated with Arterial Road widening;
3. Noise Attenuation with new development roads; and
4. Noise Attenuation associated with rail lines.

Noise Attenuation Not Associated with Road Works

The CBTMP recommends that the following guidelines be used with respect to the construction of "retrofit" noise attenuation barriers on roads where adjacent residential development currently exists:

- Where a road is not being widened, "retrofit" noise barriers will only be considered;
- Adjacent to arterial roadways only when the present traffic volume exceeds 10,000 vehicles per day;
- On a total block basis, and not an individual lot basis unless the lot is not associated with adjacent lots being used for the same purpose; and
- On receipt of a sufficiently signed petition in conformity with the provisions of the *Local Improvement Act*, R.S.O. 1990, C. L.26.

Construction priority to install noise attenuation barriers not associated with other roadway works will be established by:

- Chronological order of certification by the County Clerk of the sufficiency of the petition to install noise attenuation in accordance with the provisions of the Local Improvement Act, R.S.O. 1990, C. L.26; and
- Sufficient funds are available in the current year's Capital Works Budget.

It is intended that any qualifying noise attenuation projects will maintain their priority but may be delayed beyond a current year until funding becomes available.

Where a valid petition is received from property owners to install noise attenuation, the construction cost should be treated as a Local Improvement with 2/3 of the cost to be paid by the property owner(s) and 1/3 by the County.

Noise Attenuation Associated with Arterial Road Widening

The following guidelines should be established for the installation of "retrofit" noise barriers in conjunction with arterial road widenings where adjacent residential development currently exists:

- The installation of "retrofit" noise barrier walls is intended to ensure that existing residential backyards backing onto arterial roads which are widened to four lanes or greater are not subjected to significant noise level increases from levels that exist in the design year.
- The road to be widened must be classified as an arterial road in the County’s Road Classification System and Official Plan;

- The property must be in residential use. The property must also be back lotted onto an arterial road;

- Masonry walls or other suitable materials or earth berms will be used and the design, placement and height will be determined through a noise study;

- The noise barrier will be built within one foot of the property line on the road allowance. Private property working easements must be provided at no cost to the County; and

- This policy does not apply to the provision of noise barriers associated with the development of new residential uses which back onto arterial roads (see Official Plan provisions for such circumstances).

Noise Attenuation Associated with New Development Roads

The development of residential land uses on lands in close proximity to arterial roads and provincial freeways and highways should have regard for potential impacts from noise, vibration and/or safety concerns. Where a proposed development does not comply with provincial guidelines for acceptable levels of noise, mitigation measures may be required through the development approval process.

Excessive noise levels from high traffic volume roads may negatively impact residential land uses. New residential development which is expected to be exposed to noise levels which are above acceptable provincial standards will be required to incorporate noise attenuation measures into the development.

Noise Attenuation Associated with Rail Lines

None of the provisions of this TMP regarding noise attenuation apply to any sound arising from the operation of any railway which operates under the Railway Act of Canada or from any plant or work in connection with any such railway.

7.6 Transportation-Oriented Subdivision Design

The County of Brant has Development and Engineering Standards that provide guidance and direction in the provision of infrastructure for subdivision and site development, including roads, storm sewers, sanitary sewers, water distribution systems, other utilities and lot grading. The CBTMP has developed additional guidance in the specific provision of transportation-oriented subdivision design with the **Transportation-Oriented Subdivision Design Guidelines** prepared by IBI Group. These new guidelines are intended to augment and update the County's current Development and Engineering Standards, resulting in new residential, commercial and mixed use developments that move Towards Sustainability with designs that provide create greater transportation choice, safety and service.

The complete guidelines address subdivision design, with special attention to neighbourhoods and street layouts. They also discuss the impact of improved subdivision design and the emerging trends in subdivision design practice. They provide a general overview of general subdivision principles and standards recommended for common practice in the County.

Use of these new subdivision design guidelines is important since the shape and layout of the communities in which we live influence the nature of our environment and how we go about our daily lives, including how we move people and goods. The objective of proper subdivision design is to maximize the liveability of our neighbourhoods. This requires a safe and connective

transportation network that provides efficient access for all modes of transportation between homes, schools, work, recreation, shopping, and other activities. A well-designed neighbourhood development is generally composed of a complementary mix of land uses with internal routes and a pedestrian friendly plan.

Neighbourhood street design is more than a matter of street widths and physical dimensions. It requires a complete package of complementary design features that contribute to the overall feel of the street such as building orientation, accessibility to amenities, safety and security and overall attractiveness.

Currently, the County of Brant uses its Development and Engineering Standards to guide the design of subdivisions. The purpose of this section of the TMP, and the associated Transportation-Oriented Development Guidelines is to review the state-of-the-practice in subdivision design, and propose additional design guidelines for future developments in the County of Brant. The concepts and guidelines take into consideration the following factors:

- Safety for all road users;
- Efficiency of service for all road users;
- Liveability, as impacted by traffic elements in the circulation system; and
- Economy of land use.

7.6.1 STREET LAYOUT

The physical layout and functional characteristics of the roadway network is a fundamental element of subdivision design. Street design should reflect the intended functions of the street and the character of the abutting land uses. Neighbourhood streets serve to provide residents with convenient access between their homes and both internal and external destinations, but streets should not be over-designed or over-built such that the safety and character of the neighbourhood is compromised.

Therefore, when designing neighbourhood street systems, it is important to find a balance between an accessible and continuous roadway network for all users and a network that minimizes excessive through traffic movements and excessive vehicular travel.

It is recommended that the County of Brant adopt subdivision design practices that require a grid pattern of closely spaced roads in urban and suburban subdivisions to facilitate compact development, continuity and connectivity for all road users, and access for future potential transit operations. The following sections outline principles and elements of subdivision design that must be considered to maintain a safe, liveable and continuous subdivision street networks.

7.6.2 ACCESS AND CIRCULATION

The capacity and spacing of arterial streets has a significant influence on the potential for through traffic on neighbourhood street networks. If higher order streets are spaced too far apart or lack capacity, continuous and/or connective neighbourhood streets will attract higher levels of through traffic. Some approaches combat cut-through traffic by implementing a circuitous and inconvenient local street layout with limited intersections and discontinuities; however, encouraging discontinuity is not recommended as it is counterproductive to the overall goals of neighbourhood street design. Instead, it is recommended that continuity is maintained internally to the neighbourhood with

strategically placed access points to closely spaced arterial streets. The following recommendations help to attract vehicular traffic to arterial streets:

- Maintain adequate capacity on all arterial streets and minimize travel time for through movements (e.g. maintain progression where signals are present and eliminate the use of four-way stop control where it is safe to do so). If trips through neighbourhoods have lower travel times than those on arterial streets, neighbourhood traffic will increase;

- Limit the disruption to traffic on arterial streets by minimizing neighbourhood street access and successive intersections. The Geometric Design Guide for Canadian Roads suggest an absolute minimum spacing of 200 m between successive traffic control signals; however, if progression on the arterial street is desired, a minimum spacing of 400 m between successive signals is recommended (ITE, 2003);

- A 1.5 km minimum spacing of arterial streets is a reasonable goal for low to medium density subdivisions. Closely spaced arterial streets distributes long-distance travel over multiple streets, improves access between destinations, and offers the opportunity for transit service to operate on higher order roadways close to residential markets; and

- The time spent on neighbourhood streets to access arterial streets should be kept within a reasonable limit (60 to 90 seconds). It is expected that by providing short and convenient trips on local streets, a driver's patience threshold will not be exceeded and travel speeds will be minimized.

The roadway network should also provide proper internal access within neighbourhoods. Local and collector streets should provide two-way travel and enable reasonably safe and direct access to residences and commercial sites. The pattern of neighbourhood streets, their names and numbering systems should be clear and understandable to those not familiar with the area (e.g. visitors, delivery services). Circuitous streets and one-way streets should be avoided as they can be confusing and may impose unnecessary restrictions on road users.

During the interim period of staged development, the circulation and connectivity of the final street network must be considered. The most convenient traffic outlets during early stages of development may not be appropriate once further development is added. Aligning the street network for long-term connectivity provides consistency and continuity during the development process.

7.6.3 BLOCK LENGTHS AND INTERSECTION SPACING

The degree of network connectivity is an important characteristic of subdivisions to all road users and should be of high priority in street layout and design. Maximizing the length and perimeters of neighbourhood blocks is one strategy to improve network connectivity. The following principles are recommended for maximizing block length and the distance to access points:

- Block lengths should generally not exceed 200 m. Short block lengths not only improve connectivity, but internal traffic is diffused over a greater area and shorter blocks tend to have lower vehicular speeds;

- Block perimeters should generally not exceed 600 m. Minimizing perimeter lengths facilities pedestrian and cyclist access throughout neighbourhoods. If the perimeter of a block exceeds 600 m or if a park, school, or neighbourhood shopping is located at the midpoint of such a block, then a mid-block pathway is recommended for pedestrians and cyclists; and

- Within a neighbourhood with a branching street network, the distance between each residence and the nearest access point to an arterial street should not exceed 500 m. Considering an average speed of 35 km/h on local streets, this length is consistent with the recommended minimum driving time of 60-90 seconds.

Minimum spacing of intersections must also be considered to ensure that the street network operates properly and vehicles are provided with an adequate level of service. The recommended minimum intersection spacing of along various classes of roadways are as follows:

- Arterials – 200 m between successive traffic signals. Greater distances are required to maintain traffic signal progression;
- Collectors – 60 m; and
- Locals – 60 m.

7.6.4 FRONTAGE ON COLLECTORS

Subdivisions should be designed such that development fronts collector streets. Driveways along collector streets help to slow traffic and preserve the intended roadway function. This in turn creates a more pedestrian-friendly environment. When residential developments along collector streets are designed with the “back-lot” design, uninterrupted traffic flow results, encouraging the collector to operate as an arterial. In such cases, traffic speeds and through traffic increase, which compromise the safety and character of the neighbourhood.

7.6.5 DEAD END STREETS

It is recommended that residential parcels be accessible from two directions to facilitate continuity, pedestrian and cyclist mobility, and emergency vehicles access. However, in some cases the most efficient subdivision layout, considering the shape and terrain of available land, may include a number of dead-end streets. Most municipalities permit cul-de-sacs and other single access roadways as long as they are limited to 150 m in length. This is consistent with recommended practice, but it is recommended that cul-de-sacs conform to the following additional standards:

- To accommodate garbage trucks, delivery vehicles, emergency vehicles and/or paratransit vans, the recommended minimum radius for the circular turnaround is 15 m;
- Parking on the circular turnaround should be prohibited because of the additional right-of-way required to provide sufficient radius for turning vehicles; and
- If a cul-de-sac is located near another street with walking or cycling facilities, a direct connection/pathway to that facility is recommended.

7.6.6 INTERSECTION SIGHT TRIANGLES

All intersections must be designed with sufficient sight distance so that drivers can perceive potential conflicts and respond appropriately to negotiate the intersections safely. The minimum sight distance at uncontrolled intersections (only applicable to low volume local streets) is measured along each approach, whereas the minimum sight distance at controlled intersections is measured along the protected street. Sight triangles are used at intersection to determine the building setbacks and/or the removal of obstacles (e.g. parking zones, street furniture, trees/hedges, etc.) required to provide drivers with a clear line of sight. “Approach Site Triangles” are applied to

uncontrolled intersections and “Departure Sight Triangles” are applied to controlled intersections. Guidelines for clear sight distances for controlled and uncontrolled intersections are provided in the **Transportation-Oriented Subdivision Guidelines**.

7.6.7 SITE LAYOUT AND ORGANIZATION

Compact mixed-use developments are an efficient use of land and encourage alternative modes of transportation due to shortened and more convenient trips between destinations. Residential neighbourhoods clustered with compatible and complementary land uses such as offices, schools and retail contribute to a denser and more compact form of development. The overall site layout of such developments should consider the following:

- Adequate degree of non-motorized access between destinations;
- Efficient use of parking;
- Placement of developments and building orientation; and
- Overall attractiveness of environment.

General principles for elements of site organization such as building placement and orientation, parking, and pedestrian and cyclists access are presented below.

Building Placement and Orientation

Building placement influences pedestrian access and activity along street frontages and impacts the overall appearance and character of the surrounding site. The following guidelines aim to promote activity along street frontages and maximize pedestrian, cycling and transit access:

- Arrange buildings such that the distance between complementary uses is minimized;
- Place buildings and public uses (e.g. retails stores, restaurants, etc.) parallel to the street with a consistent setback to animate the street front, to improve access, and to provide a well-defined edge of public activity; and
- Place higher density uses close to intersections to facilitate access from both streets.

Parking Location

- Locate parking at the rear or on the “inside” of the building mass rather than on street side to improve pedestrian access and increase visibility of buildings; and
- Provide smaller, more dispersed parking areas instead of one large parking area. Smaller, multiple parking areas are more attractive than one vast parking area, reduce the concentration of storm water run-off, and decrease conflict points between vehicles and non-motorists.

Pedestrian and Cyclist Access

- Walking and cycling facilities should be an integral part of subdivision planning. A continuous and convenient walking and cycling network is fundamental to encouraging non-motorized modes of transportation. Site layout that encourages pedestrian and cyclist travel should consider the following:

- A system of pedestrian walkways should provide direct connectivity to all developed parts of a subdivision. In addition to sidewalks along streets, pedestrian networks may include facilities between buildings, particularly those of complementary uses.

- On neighbourhood streets, bicyclists can be accommodated within the roadway, but on higher volume streets, additional facilities such as widened curb lanes or dedicated bike lanes should be considered. Bicycle parking facilities should also be provided at all high activity destinations.

7.6.8 TRANSIT SUPPORTIVE STRATEGIES – PARIS SETTLEMENT

Considering the potential for residential growth in the County of Brant, subdivisions associated with the Paris settlement area, and specifically the SW Paris urban expansion area should be designed such that transit service can be supported. Many of the policy recommendations presented thus far coincide with the primary guidelines for transit supportive development. These are:

- A closely spaced grid network of continuous streets to provide direct and efficient transit routing and ensure a majority of the market is serviced;

- Compact, mixed-use developments that intensify activity and supply multiple destinations in close proximity;

- Street orientation of land uses to increase pedestrian access and promote activity along street frontages;

- Short block lengths to improve pedestrian access and reduce congestion by offering more choice in available routes; and

- A convenient and connective pedestrian network provides better access to transit routes and helps to promote ridership.

The planning of transit routes and nodes and subdivision layouts should be a concurrent and mutually supportive exercise, in which both the efficiency of potential transit routes and the proportion of users and destinations served are optimized. When the implementation of transit service is more visible on the planning horizon, it is recommended that the County of Brant refer to the **Transportation-Oriented Transportation Guidelines** prepared as part of the TMP preparation, plus the Ontario Ministry of Transportation's *Transit Supportive Land Use Planning* for more detailed transit oriented development strategies.

7.6.9 CONCLUSIONS AND RECOMMENDATIONS

1. As part of further subdivision development in any of the County's urban settlements, the County of Brant should incorporate the proposed guidelines supporting a grid network of closely spaced roadways and short block lengths to foster continuous and accessible circulation within and between neighbourhoods and communities;

2. The County of Brant should incorporate the proposed guidelines regarding the design of compact and accessible built form development with street-oriented land uses and features that promote the use of non-motorized transportation into the Engineering Standards and Development Standards;

3. The proposed guidelines also support transit-oriented development, and therefore the County of Brant should include the planning of transit as a mutually supportive exercise to subdivision design in urban settlement areas; and

4. The proposed subdivision design guidelines should be considered for inclusion, where appropriate, within the County's new Official Plan.

APPENDIX 1

PUBLIC CONSULTATION MATERIALS

COUNTY OF BRANT
TRANSPORTATION MASTER PLAN

NOTICE OF STUDY COMMENCEMENT

Help Plan the Future of Brant County Transportation

The County of Brant has initiated the preparation of a Transportation Master Plan that will:

- Identify existing and future levels of travel demand throughout the County.
- Outline the transportation infrastructure needed to ensure safe and efficient movement of people, goods and service for the economic growth and prosperity of the County.
- Develop policies and guidelines for all modes of transportation in the County, including roads, rail, air, trucking, transit, cycling and walking.

Public and review agency consultation is a key element of the master planning process, and public input will be sought throughout this study.

Members of the public and interested group and agency representatives are encouraged to contact any or all of the following Project Team members listed below to register to receive further notification of upcoming Public Information Centres, Focus Group Sessions and project newsletters. If you want to provide initial input to the study on what you believe are transportation issues in Brant County, you are also encouraged to provide your input to these Project Team contacts. Information about the project will also be provided on the County's web site at www.brant.ca.

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The Transportation Master Plan will satisfy Phases 1 and 2 of the Province's Municipal Class Environmental Assessment Process by establishing the need and justification for specific transportation infrastructure improvement projects.

This notice was first issued on November 8, 2006

COUNTY OF BRANT TRANSPORTATION MASTER PLAN
NOTICE OF PUBLIC INFORMATION CENTRE #1

STUDY STATUS

The County of Brant is undertaking a Transportation Master Plan that will:

- Identify existing and future levels of travel demand throughout the County;
- Outline the transportation infrastructure needed to ensure safe and efficient movement of people, goods and service for the economic growth and prosperity of the County; and
- Develop policies and guidelines for all modes of transportation in the County, including roads, rail, air, trucking, transit, cycling and walking.

PUBLIC INFORMATION CENTRE #1

The first set of Public Information Centres has been arranged to review and receive input from the public about the collection of background information and identification of transportation issues in the County. Three Public Information Centres will be held in different locations in the County to provide more opportunity for public attendance and input. All those with an interest are urged to drop in to one of the following Public Information Centres:

General Location #1
Date: Thursday, February 8, 2007
Time: 4:30 pm – 8:30 pm
Location: Burford Arena
14 Potter Drive

General Location #2
Date: Thursday, February 15, 2007
Time: 4:30 pm – 8:30 pm
Location: Paris District High School
Cafeteria
231 Grand River St. N

General Location #3
Date: Thursday, March 1, 2007
Time: 4:30 pm – 8:30 pm
Location: Cainsville Community
Centre, 14 Garnet Rd.

Please note, these meetings will be held in conjunction with Public Consultation Meeting #1 for the County of Brant Official Plan Review project.

STUDY CONTACTS

If you have any questions or wish to be added to the study mailing list, please contact:

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Information about this project will also be provided on the County's website at www.brant.ca.

The Transportation Master Plan will satisfy Phases 1 and 2 of the Province's Municipal Class Environmental Assessment Process by establishing the need and justification for specific transportation infrastructure improvement projects.

REVISED NOTICE OF TRANSPORTATION MASTER PLAN AND FIVE-YEAR OFFICIAL PLAN REVIEW OPEN HOUSE SESSION

SCOPE OF OPEN HOUSE:

The County of Brant is undertaking an Official Plan Review that will, update and refine the policies and schedules of the existing Official Plan in keeping with new provincial policy initiatives. In addition the review will incorporate the findings of several on-going County studies including the Master Servicing Plan for the Paris Urban Settlement Area, and the Brant County Population, Household and Employment Projections. The County is also undertaking a Transportation Master Plan that will guide Council in improving the Transportation Network in the County.

RESCHEDULED PUBLIC CONSULTATION OPEN HOUSE SESSION - CAINSVILLE

The first set of Public Consultation Open House Sessions were arranged to review and receive input from the public about the collection of background information and identification of problems. Three Public Consultation Open House Sessions were held in different locations in the County to provide more opportunity for public attendance and input. In total there will be 9 Open House Sessions. The Cainsville Open House originally scheduled for March 1, 2007 required rescheduling due to the weather. All those with an interest are urged to attend. Details of the Public Consultation Open House Session are:

Location: Cainsville Community Centre, 14 Garnet Road, Cainsville
Date: March 26, 2007
Time: 4:30 p.m.-8:30 p.m.

STUDY CONTACTS

If you have any questions or wish to be added to the Transportation Master Plan mailing list, please contact:

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If you have any questions or wish to be added to the Official Plan Review mailing list, please contact:

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Information about this project will also be provided on the County's website at www.brant.ca.

COUNTY OF BRANT
TRANSPORTATION MASTER PLAN

PUBLIC INFORMATION CENTRE #1

Information Handout

The County of Brant has initiated the preparation of a Transportation Master Plan that will:

- Identify existing and future levels of travel demand throughout the County.
- Outline the transportation infrastructure needed to ensure safe and efficient movement of people, goods and service for the economic growth and prosperity of the County.
- Develop policies and guidelines for all modes of transportation in the County, including roads, rail, air, trucking, transit, cycling and walking.

Members of the public and interested group and agency representatives are encouraged to contact any or all of the following Project Team members listed below to register to receive further notification of upcoming Public Information Centres, Focus Group Sessions and project newsletters. If you want to provide initial input to the study on what you believe are transportation issues in Brant County, you are also encouraged to provide your input to these Project Team contacts. Information about the project will also be provided on the County's web site at www.brant.ca.

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The Transportation Master Plan will satisfy Phases 1 and 2 of the Province's Municipal Class Environmental Assessment Process by establishing the need and justification for specific transportation infrastructure improvement projects.

COUNTY OF BRANT TRANSPORTATION MASTER PLAN
NOTICE OF SPECIAL COUNCIL MEETING AND PUBLIC MEETING

PROJECT STATUS

The County of Brant has drafted a new Transportation Master Plan in conjunction with updating the County's Official Plan. The draft Transportation Master Plan will now be presented to County Council and the public for consideration and response at a Special Council meeting on Wednesday, June 25, 2008. This Master Plan:

- Identifies existing and future levels of travel demand on a County-wide basis;
- Coordinates with highway planning by the Ontario Ministry of Transportation and road planning by the City of Brantford;
- Outlines the transportation infrastructure improvements that may be needed to ensure safe and efficient movement of people, goods and service for the economic growth and prosperity of the County; and
- Provides new guidelines and policies for:
  1. An updated road classification system for the County
  2. Planning for goods movement and truck routes focusing on the Paris area
  3. Providing transit service in the County
  4. Deciding on installing stop signs and traffic signals
  5. Taking action to reduce the demand for auto travel in the County
  6. Requiring the preparation of Traffic Impact Studies as part of the land development process
  7. Planning transportation-oriented subdivisions for all travel modes
  8. Planning more recreational trails in the County
  9. Managing access on County Roads to maintain roadway capacity
  10. How to install roundabouts at strategic County road intersections.

SPECIAL COUNCIL MEETING TO INTRODUCE THE DRAFT TRANSPORTATION MASTER PLAN

Project consultants will present the draft Transportation Master Plan to County Council and the public at the following Special Council Meeting:

Date:	**Wednesday, June 25, 2008**
Time:	**7:00 p.m. to 9:00 p.m.**
Location:	**Airport Community Centre**
	3 Airport Road, RR #4, Brantford
Format:	**Presentation of the Draft Plan**
	Questions by members of County Council
	Questions by Members of the Public
	Further Direction by County Council

STUDY CONTACTS

If you have any questions or wish to be added to the study mailing list, please contact:

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The Transportation Master Plan will satisfy Phases 1 and 2 of the Province's Municipal Class Environmental Assessment Process by establishing the need and justification for specific transportation infrastructure improvement projects.

IBI GROUP

COUNTY OF BRANT TRANSPORTATION MASTER PLAN
RESPONSE FROM EXTERNAL AGENCIES AND STAKEHOLDERS
As of December 18, 2006

Agency	Name	Phone/Fax/E-mail	Response	Comments
Canadian National Railway	Marissa Crawford	905-669-3114 905-760-3498 (F) marissa.Crawford@on.ca	No comments Request Being Kept Informed	
Six Nations Council – Public Works	Derek Hill	519-445-4242 519-445-4763 (F) derekhill@sixnations.ca	Request Direct Involvement	Request copies of relevant documents, i.e. reports, studies, etc.
Ministry of the Environment West Central Region	Jennifer Arthur	905-521-7664 905-521-7820 (F)	Letter	Request one copy of the Notice of Completion with complete Master Plan Document for review, filing, and potential comments as well as any information available in the interim such as PIC packages.
County of Haldimand	Edward Soldo	905-318-5367 905-765-1436 (F) edoldo@haldimandcounty.on.ca	Request Direct Involvement	
Long Point Region Conservation Authority	Bill Baskerville	519-428-4623 519-428-1520 (F) bbaskerville@lprca.on.ca	Request Being Kept Informed	
Ministry of Natural Resources	Mike Stone	519-826-4912 519-826-4929(F) mike.stone@mnr.gov.on.ca	Request Being Kept Informed	
Corporation of the City of Brantford – Engineering Department	W.D. Wood	519-759-1350 519-754-0724 (F) wwood@brantford.ca	Request Being Kept Informed	
Six Nations Lands and Resources	Kate Cave	519-753-0665 519-753-3449 kcave@sixnations.ca	Request Being Kept Informed Request Direct Involvement	Six Nations may request direct involvement at a future time
Grand River Conservation Authority	David Cunningham	519-621-2763, ext 228 519-621-4945 (F) dcunningham@grandriver.ca	Request Being Kept Informed	Letter sent
Regional Municipality of Waterloo – Transportation Planning	Graham Vincent	519-575-4489 519-575-4449 (F) vgraham@region.waterloo.on.ca	Request Being Kept Informed	
Parks Canada	Mark Yeates	613-938-5937 613-938-5987 (F) mark.yeates@pc.gc.ca	No Comments No Concerns No Need for Further Contact	
Township of Blandford-	Gary Crandall	519-463-5347, ext 226	Request Being Kept	Brant-Oxford Road with AADT of

Blenheim		519-463-5881 (F) gcrandall@twp.bla-ble.on.ca	Informed	3,000+ in 2004 should be considered to be an upper tier road with Oxford County. TSH is currently completing study for Oxford. Recommendations should be made to Oxford to take the road over from Bla-Ble.
City of Brantford, Planning Department	Tricia Givens	519-759-4222, ext 2348 519-752-6977 (F) tgivens@brantford.ca	Request Being Kept Informed	No comments at this time. However it is anticipated that comments will be made further in the study process.
J.H. Cohoon Engineering Limited	Joe Cohoon	519-753-2656 519-753-4263 (F) jhc@cohooneng.com	Request Being Kept Informed	
Brantford Flight Centre	Robert Michalchuk	519-753-2521 519-753-3617 (F) flybfc@worldchat.com	Request Being Kept Informed	
Ministry of Transportation	John Morrisey/Trish English	519-873-4587 519-873-4600 (F) trish.English@ontario.ca	Request Being Kept Informed	Letter sent
Hydro One	M. Bassindale	1-888-652-2302 905-627-6000 (F)	No Comments	
Department of Indian and Northern Affairs	Don Boswell	819-953-1940 boswelld@ainc-inac.gc.ca	Request Being Informed Request Direct Involvement	
Haldimand County	Elaine Brunn Shaw, Manager Planning & Development	905-318-5732, x 204 905-768-7328 (F) ebrunnshaw@haldimandcounty.on.ca	Request Being Kept Informed	
Indians and Northern Affairs Canada	Gail Mitchell Director	819-953-2909	Request Being Kept Informed	Contact Audrey Stewart, Director General Specific Claims Branch (819-994-2323) and Franklin Roy, Director General Litigation Management and Resolution Branch 819-997-3582
Indian and Northern Affairs Canada	Don Boswell A/Senior Claims Analyst	819-953-1940	Request Being Kept Informed	Contact Comprehensive Claims Branch (819-994-7521) or the Susan Winger of the Litigation Management and Resolution Branch (819-994-9548)

APPENDIX 2

TRIP GENERATION

Project Name: Brant County Trip Forecasts
Project #: 12325
Trip Rates and Site Traffic Generation

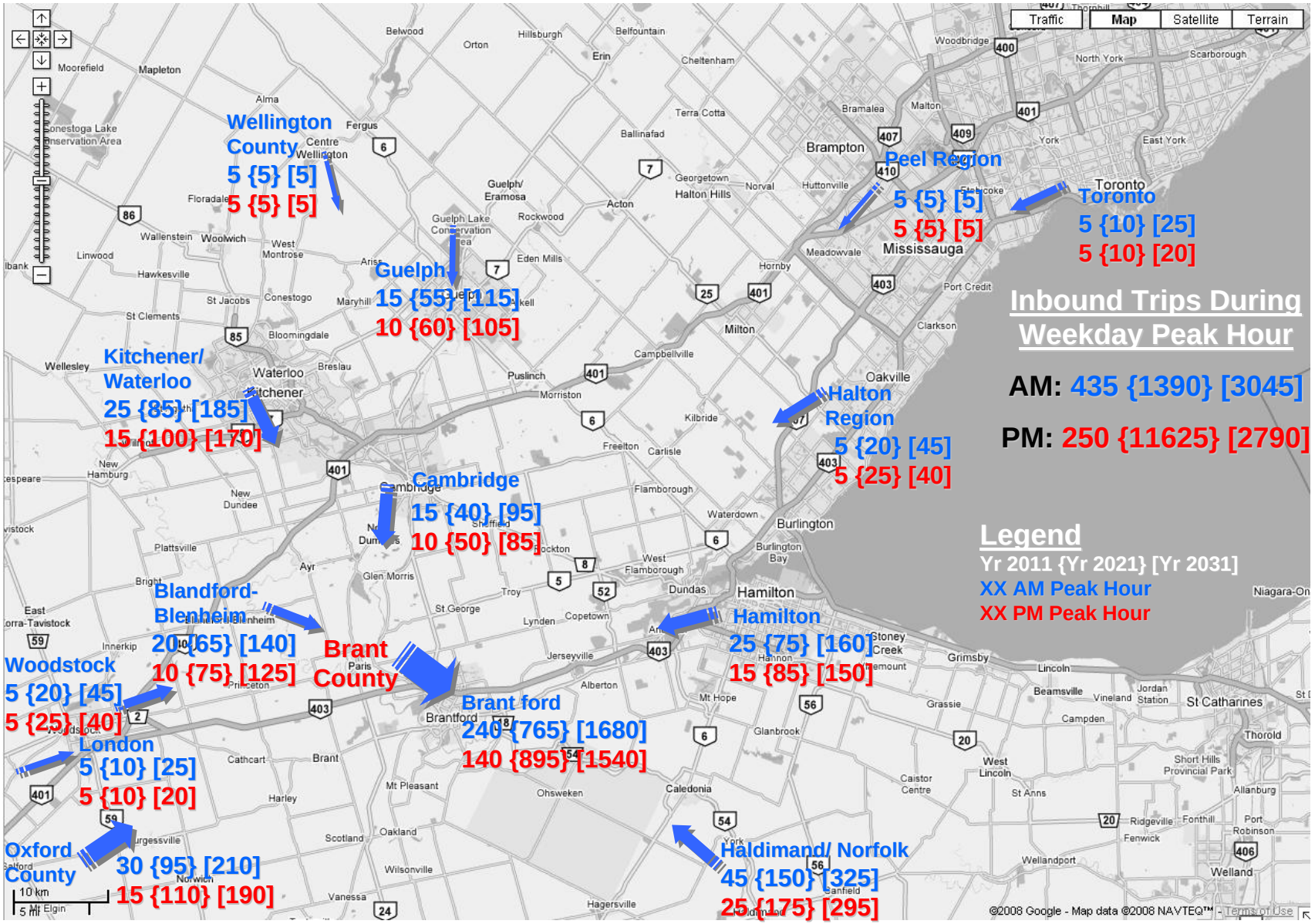
Growth area	ITE Code[3]	Variables	Year 2006-2011 Housing Unit[1]	Year 2006-2011 MORNING PEAK HOUR IN	Year 2006-2011 MORNING PEAK HOUR OUT	Year 2006-2011 MORNING PEAK HOUR 2-WAY	Year 2006-2011 AFTERNOON PEAK HOUR IN	Year 2006-2011 AFTERNOON PEAK HOUR OUT	Year 2006-2011 AFTERNOON PEAK HOUR 2-WAY	Year 2011-2021 Housing Unit	Year 2011-2021 MORNING PEAK HOUR IN	Year 2011-2021 MORNING PEAK HOUR OUT	Year 2011-2021 MORNING PEAK HOUR 2-WAY	Year 2011-2021 AFTERNOON PEAK HOUR IN	Year 2011-2021 AFTERNOON PEAK HOUR OUT	Year 2011-2021 AFTERNOON PEAK HOUR 2-WAY	Year 2021-2031 Housing Unit	Year 2021-2031 MORNING PEAK HOUR IN	Year 2021-2031 MORNING PEAK HOUR OUT	Year 2021-2031 MORNING PEAK HOUR 2-WAY	Year 2021-2031 AFTERNOON PEAK HOUR IN	Year 2021-2031 AFTERNOON PEAK HOUR OUT	Year 2021-2031 AFTERNOON PEAK HOUR 2-WAY
Fully Served																							
Paris (existing built boundary)	ITE 210	Trips Rates	73	0.21	0.62	0.83	0.70	0.41	1.11	91	0.20	0.60	0.80	0.68	0.40	1.08	110	0.20	0.59	0.79	0.67	0.39	1.06
		Trip Ends		15	45	61	51	30	81		18	55	73	62	37	99		22	65	86	73	43	116
	ITE 230	Trips Rates	19	0.12	0.60	0.72	0.54	0.27	0.81	24	0.12	0.57	0.69	0.52	0.26	0.78	29	0.11	0.55	0.66	0.50	0.25	0.75
		Trip Ends		2	11	14	10	5	15		3	14	16	12	6	18		3	16	19	14	7	21
	ITE 222[2]	Trips Rates	8	0.08	0.23	0.31	0.21	0.14	0.35	10	0.08	0.23	0.31	0.21	0.14	0.35	12	0.08	0.23	0.31	0.21	0.14	0.35
		Trip Ends		1	2	3	2	1	3		1	2	3	3	1	4		1	3	4	2	2	4
	Sub-total		100	18	59	77	63	36	99	125	22	71	93	77	44	121	150	26	83	109	90	52	141
SW Paris	ITE 210	Trips Rates	190	0.19	0.56	0.75	0.63	0.37	1.01	1132	0.18	0.53	0.71	0.53	0.31	0.84	1241	0.18	0.53	0.71	0.52	0.31	0.83
		Trip Ends		36	107	142	120	71	191		200	601	801	600	352	952		220	659	878	651	383	1034
	ITE 230	Trips Rates	49	0.10	0.49	0.59	0.46	0.23	0.68	295	0.07	0.35	0.42	0.33	0.16	0.49	323	0.07	0.34	0.41	0.33	0.16	0.49
		Trip Ends		5	24	29	23	11	34		21	102	123	98	48	146		22	109	132	105	52	157
	ITE 222	Trips Rates	21	0.08	0.23	0.31	0.21	0.14	0.35	124	0.08	0.23	0.30	0.26	0.16	0.42	136	0.08	0.23	0.30	0.25	0.16	0.41
		Trip Ends		2	4	6	4	3	7		10	28	38	32	20	52		10	31	41	34	22	56
	ITE 110	Trips Rates	1500	0.26	0.05	0.32	0.07	0.26	0.33	3750	0.24	0.05	0.29	0.06	0.24	0.31	6000	0.23	0.05	0.28	0.06	0.24	0.30
		Trip Ends		395	81	475	104	389	493		899	184	1083	241	905	1146		1403	287	1690	378	1420	1798
	Sub-total		260	437	216	653	251	474	725	1550	1130	915	2045	969	1325	2295	1700	1655	1087	2742	1168	1877	3045
St. George	ITE 210	Trips Rates	47	0.22	0.67	0.90	0.73	0.43	1.15	**No Growth Predicted**													
		Trip Ends		11	32	43	35	20	55														
	ITE 230	Trips Rates	12	0.13	0.65	0.78	0.59	0.29	0.88														
		Trip Ends		2	8	10	7	4	11														
	ITE 222	Trips Rates	5	0.08	0.24	0.31	0.21	0.14	0.35														
		Trip Ends		1	1	2	1	1	2														
	Sub-total		65	13	41	54	43	25	67														
Partially Services																							
Oakhill	ITE 210	Trips Rates	18	0.30	0.91	1.22	0.80	0.47	1.27	15	0.34	1.01	1.35	0.82	0.48	1.30	15	0.34	1.01	1.35	0.82	0.48	1.30
		Trip Ends		6	17	22	15	9	23		5	15	20	12	7	19		5	15	20	12	7	19
	ITE 230	Trips Rates	5	0.16	0.79	0.95	0.70	0.34	1.04	4	0.17	0.82	0.99	0.73	0.36	1.08	4	0.17	0.82	0.99	0.73	0.36	1.08
		Trip Ends		1	4	5	3	2	5		1	3	4	3	1	4		1	3	4	3	1	4
	ITE 222	Trips Rates	2	0.08	0.24	0.32	0.21	0.14	0.35	2	0.08	0.24	0.32	0.21	0.14	0.35	2	0.08	0.24	0.32	0.21	0.14	0.35
		Trip Ends		0	1	1	1	0	1		0	1	1	1	0	1		0	1	1	1	0	1
	Sub-total		25	6	21	28	19	10	29	20	6	19	24	16	9	24	20	6	19	24	16	9	24
Mt Pleasant/Tutela Heights	ITE 210	Trips Rates	44	0.23	0.69	0.92	0.73	0.43	1.16	29	0.26	0.77	1.02	0.76	0.45	1.21	29	0.26	0.77	1.02	0.76	0.45	1.21
		Trip Ends		10	30	40	32	19	51		7	22	30	22	13	35		7	22	30	22	13	35
	ITE 230	Trips Rates	11	0.14	0.66	0.80	0.60	0.29	0.89	8	0.15	0.72	0.86	0.64	0.32	0.96	8	0.15	0.72	0.86	0.64	0.32	0.96
		Trip Ends		2	8	9	7	3	10		1	5	7	5	2	7		1	5	7	5	2	7
	ITE 222	Trips Rates	5	0.08	0.24	0.31	0.21	0.14	0.35	3	0.08	0.24	0.32	0.21	0.14	0.35	3	0.08	0.24	0.32	0.21	0.14	0.35
		Trip Ends		0	2	2	1	1	2		0	1	1	1	0	1		0	1	1	1	0	1
	Sub-total		60	12	39	51	40	23	63	40	9	29	37	28	16	44	40	9	29	37	28	16	44
SW Paris	ITE 210	Trips Rates	4	0.82	2.46	3.28	0.94	0.55	1.49	**No Growth Predicted**													
		Trip Ends		3	9	12	3	2	5														
	ITE 230	Trips Rates	1	0.22	1.09	1.31	0.93	0.46	1.39														
		Trip Ends		0	1	1	1	0	1														
	ITE 222	Trips Rates	0	0.08	0.24	0.32	0.21	0.14	0.35														
		Trip Ends		0	0	0	0	0	0														
	Sub-total		5	3	10	13	4	3	7														
No Services	ITE 210	Trips Rates	274	0.18	0.55	0.73	0.61	0.36	0.97	193	0.19	0.56	0.75	0.63	0.37	1.00	175	0.19	0.57	0.75	0.64	0.37	1.01
		Trip Ends		50	151	201	167	98	265		36	109	145	122	72	194		33	99	132	112	66	178
	ITE 230	Trips Rates	71	0.09	0.46	0.55	0.43	0.21	0.64	50	0.10	0.49	0.59	0.46	0.22	0.68	46	0.10	0.50	0.60	0.46	0.23	0.69
		Trip Ends		7	33	39	31	15	46		5	25	30	23	11	34		5	23	28	21	10	32
	ITE 222	Trips Rates	30	0.08	0.23	0.31	0.21	0.14	0.35	21	0.08	0.23	0.31	0.21	0.14	0.35	19	0.08	0.23	0.31	0.21	0.14	0.35
		Trip Ends		2	7	9	7	4	11		2	5	7	4	3	7		2	4	6	4	3	7
	Sub-total		375	59	190	250	205	117	322	265	43	138	181	149	86	235	240	40	126	166	137	79	216
Grand Total (Total of Fully, Partially and No-Services)			**890**	**549**	**577**	**1126**	**624**	**688**	**1312**	**2000**	**1209**	**1172**	**2381**	**1239**	**1480**	**2719**	**2150**	**1735**	**1343**	**3079**	**1439**	**2032**	**3470**

Notes: 1. Forecast housing mix:

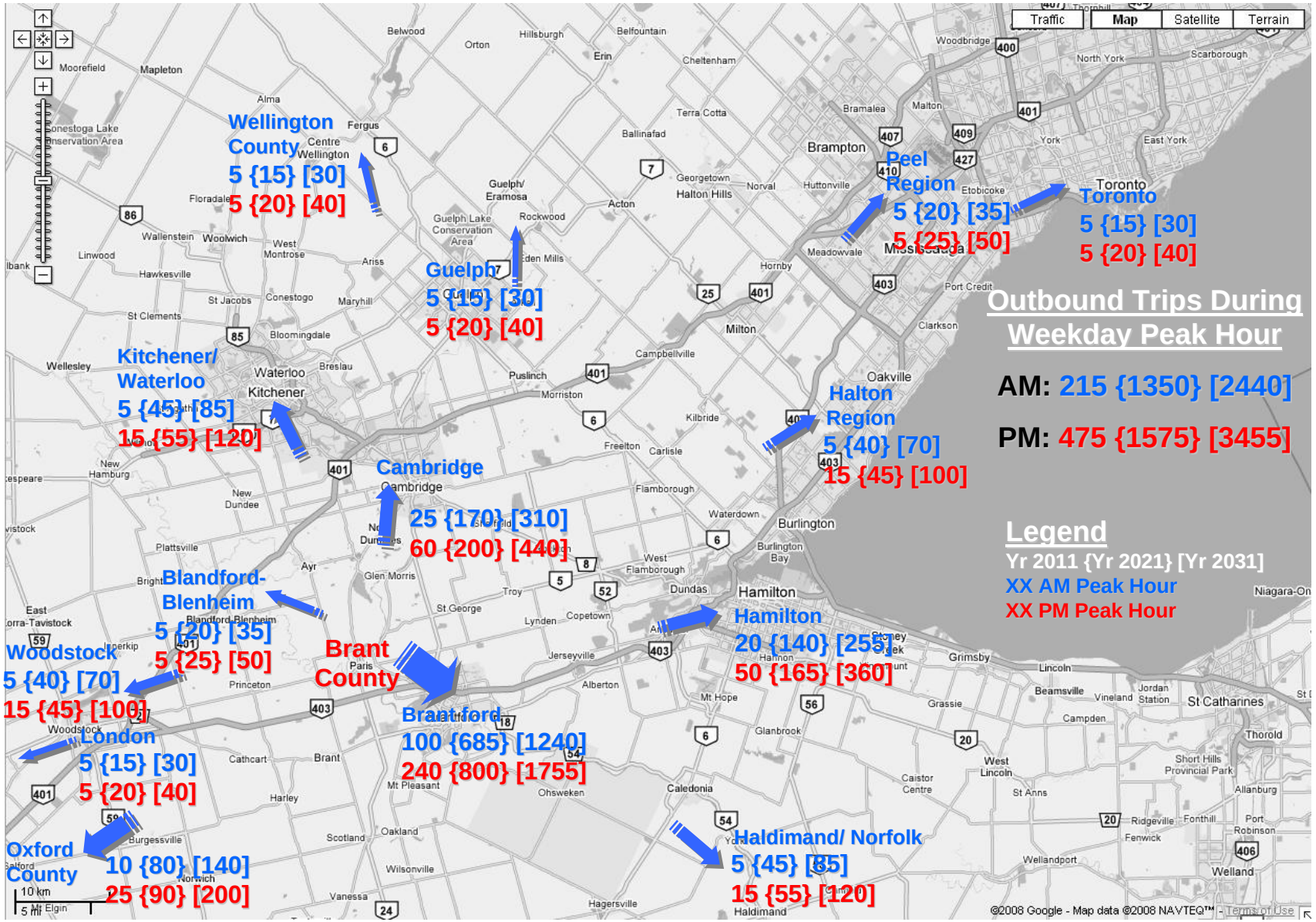
Low-density	73%
Medium Density	19%
High-density	8%

2. ITE 222 - Weekday p.m. hour "average" trip rates were used
3. ITE 210 - Single-Family Detached Housing reflects low-density housing unit; ITE 230 - Residential Condominium/Townhouse reflects medium-density housing unit; ITE 222 - High-Rise Apartments reflects high-density housing unit.
4. ITE 110 - General industrial reflects 75% of the serviced industrial land in the County is in SW Paris.

Trip Origin from Brant County (Yr 2031)



Trip Destination from Brant County (Yr 2031)



Project Name: Brant County Trip Forecasts
Project #: 12325
Summary of Trip Rates and Site Traffic Generation

SW Paris Only

					Morning		Afternoon		Morning		Afternoon		Morning		Afternoon	
					Year 2006-2011				Year 2011-2021				Year 2021-2031			
Area Location	**Inbound**	**%**	**Outbound**	**%**	**Inbound**	**Outbound**	**Inbound**	**Outbound**	**Inbound**	**Outbound**	**Inbound**	**Outbound**	**Inbound**	**Outbound**	**Inbound**	**Outbound**
Brantford	3625	55%	4400	51%	241	110	138	241	766	687	895	801	1679	1240	1539	1755
Cambridge	200	3%	1100	13%	13	27	8	60	42	172	49	200	93	310	85	439
Hamilton	350	5%	900	10%	23	22	13	49	74	141	86	164	162	254	149	359
Oxford County	450	7%	500	6%	30	12	17	27	95	78	111	91	208	141	191	199
Kitchener/waterloo	400	6%	300	3%	27	7	15	16	85	47	99	55	185	85	170	120
Haldimand-Norfolk Region	700	11%	300	3%	47	7	27	16	148	47	173	55	324	85	297	120
Halton Region	100	2%	250	3%	7	6	4	14	21	39	25	46	46	70	42	100
Peel Region		0%	130	2%	0	3	0	7	0	20	0	24	0	37	0	52
Blandford-Blenheim	300	5%	125	1%	20	3	11	7	63	20	74	23	139	35	127	50
Toronto	50	1%	100	1%	3	2	2	5	11	16	12	18	23	28	21	40
Wellington County		0%	100	1%	0	2	0	5	0	16	0	18	0	28	0	40
Guelph	250	4%	100	1%	17	2	10	5	53	16	62	18	116	28	106	40
London	50	1%	100	1%	3	2	2	5	11	16	12	18	23	28	21	40
Middlesex County		0%		0%	0	0	0	0	0	0	0	0	0	0	0	0
Woodstock	100	2%	250	3%	7	6	4	14	21	39	25	46	46	70	42	100
Within Brant County																
Grand Total	**6575**		**8655**	100%	437	216	251	474	1390	1352	1623	1576	3045	2439	2791	3453

Project Name: Brant County Trip Forecasts
Project #: 12325
Summary of Trip Rates and Site Traffic Generation

Growth area	Year 2006-2011							Year 2011-2021							Year 2021-2031						
	Housing Unit[1]	MORNING PEAK HOUR			AFTERNOON PEAK HOUR			Housing Unit	MORNING PEAK HOUR			AFTERNOON PEAK HOUR			Housing Unit	MORNING PEAK HOUR			AFTERNOON PEAK HOUR		
		IN	OUT	2-WAY	IN	OUT	2-WAY		IN	OUT	2-WAY	IN	OUT	2-WAY		IN	OUT	2-WAY	IN	OUT	2-WAY
Fully Served																					
Paris (existing built boundary)	100	18	59	77	70	41	111	225	40	130	169	147	85	232	375	66	213	278	237	137	374
SW Paris	260	437	216	653	251	474	725	1810	1390	1352	2262	1623	1576	2769	3510	3045	2439	5003	2791	3453	5814
Remaining Paris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
St. George	65	13	41	54	43	25	67	65	13	41	54	43	25	67	65	13	41	54	43	25	67
Cainsville	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total (Fully Served)	**425**	**468**	**316**	**784**	**364**	**539**	**903**	**2100**	**1911**	**1839**	**3270**	**2177**	**2225**	**3972**	**3950**	**5036**	**4531**	**8606**	**5248**	**5839**	**10227**
Partially Served																					
Oakhill	25	6	21	28	19	10	29	45	12	40	52	34	19	53	65	18	59	77	50	28	78
Mt Pleasant/Tutela Heights	60	12	39	51	40	23	63	100	21	68	89	68	39	107	140	30	96	126	96	55	150
SW Paris	5	3	10	13	4	3	7	5	3	10	13	4	3	7	5	3	10	13	4	3	7
Sub-Total (Partially Served)	**90**	**22**	**71**	**92**	**63**	**36**	**99**	**150**	**36**	**118**	**154**	**107**	**60**	**167**	**210**	**51**	**165**	**216**	**150**	**85**	**235**
No Services	**375**	**59**	**190**	**250**	**205**	**117**	**322**	**640**	**102**	**329**	**431**	**354**	**203**	**557**	**880**	**142**	**455**	**597**	**491**	**282**	**773**
Grand Total (Total of Fully, Partially and No-Services)	**890**	**549**	**577**	**1126**	**632**	**693**	**1324**	**2890**	**2050**	**2286**	**3855**	**2637**	**2489**	**4696**	**5040**	**5228**	**5152**	**9419**	**5889**	**6206**	**11235**

Note: 1. SW Paris trip generation numbers includes both employment and populations forecast. Other area number presents trip generation forecasts based on population only.

