Ontario

Ministry of Transportation

Highway 7&8 Transportation Corridor Planning and Class EA Study

From Greater Stratford to New Hamburg Area
MTO Group Work Project # 13-00-00

Report B: Overview of Transportation, Land Use and Economic Conditions within the Analysis Area

DRAFT

July 2007

www.7and8corridorstudy.ca

This report is presented in draft format in order to obtain information and comments from stakeholders. Your input is requested by October 30, 2007 so the report can be finalized.

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1.0 INTRODUCTION

1.1 Introduction To The Highway 7&8 Transportation Corridor Planning And Class EA Study

The Ministry of Transportation (MTO) is undertaking a Highway 7&8 Transportation Corridor Planning and Class Environmental Assessment (Class EA) Study, from Greater Stratford to the New Hamburg Area. The study will:

- Develop a plan that:
  - Identifies factors driving 'Area Transportation Systems' needs;
  - Provides multi-modal strategies (road, transit, etc.) to address the 'Area Transportation System' problems and opportunities within the Analysis Area; and
  - Identifies provincial highway and/or provincial transitway alternatives to be carried forward.
- Prepare a preliminary design for the provincial roadway components of the recommended plan; and
- Prepare a Transportation Environmental Study Report for public review at study completion.

This study will also:

- Review and build on the MTO Highway 7&8 Study Design – Greater Stratford to New Hamburg Area, December 2005;
- Address the transportation policies and directions of the 'Growth Plan for the Greater Golden Horseshoe' (recognizing that a portion of the analysis area for this project lies within the GGH);
- Recognize several municipal transportation initiatives in the area;
- Recognize other relevant transportation corridor studies being undertaken by MTO; and
- Be carried out as a Group 'A' project, in accordance with the Class Environmental Assessment for Provincial Transportation Facilities.

Access to the above documents can be obtained through the project website at www.7and8corridorstudy.ca.

A major component of the study is an outreach and consultation program structured around six key points of decision-making, each of which will be supported by:

- the release of a newsletter;
- the release of draft reports for review and comment;
- a round of Public Information Centres (PICs);
- posting of information on the study web site; and
- newspaper notices announcing the above.

At the completion of the study, the filing of a Transportation Environmental Study Report (TESR) will be announced through newspaper notices. Decisions on funding and timing of

detail design and construction are based upon environmental clearance of the TESR, since it determines the type of transportation facilities and their location.

For orientation and reference, a map of the Analysis Area is provided in **Exhibit 1.1** below. The Analysis Area is discussed in Section 2 of this report.

Exhibit 1.1

Highway 7&8 Transportation Corridor Planning and Class EA Study

MAP OF ANALYSIS AREA

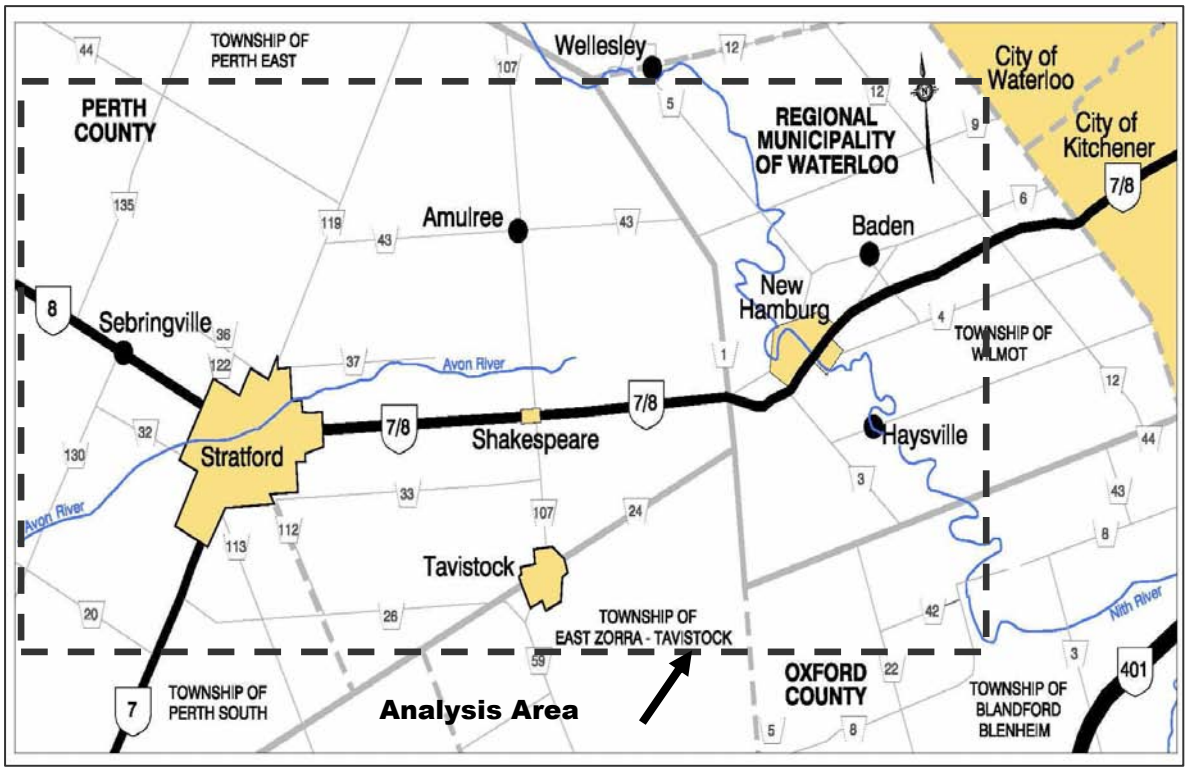


Exhibit 1.2 below provides a summary of study objectives from Report A of this study (the 'Study Plan for Technical Work, Outreach and Consultation'):

Exhibit 1.2 **Highway 7&8 Transportation Corridor Planning and Class EA Study** **Summary of Study Objectives**
1. To identify and assess the factors that are driving 'Area Transportation System' needs
2. To apply those driving factors in developing a 'Area Transportation System' strategy to address long-term multi-year needs for the movement of people and goods

Exhibit 1.2 Highway 7&8 Transportation Corridor Planning and Class EA Study Summary of Study Objectives
3. To undertake the planning and preliminary design of the provincial roadway components (provincial highways and provincial transitways) of those strategies
4. To conduct the planning and preliminary design of provincial roadways with an inherent approach of avoiding or minimizing overall environmental impacts
5. To identify highway access management measures for growth management and highway protection
6. To engage public and stakeholders early in the study process and continue to engage them throughout the study process

Exhibit 1.3 below provides a preliminary statement of transportation problems and opportunities from Report A of this study:

Exhibit 1.3 Highway 7&8 Transportation Corridor Planning and Class EA Study Preliminary Statement of Transportation Problems and Opportunities
1. There are transportation capacity concerns for the movement of both people and goods along the 2-lane section of Highway 7&8 between Stratford and the New Hamburg area and on Highway 7&8 through the urban centres (Stratford, Shakespeare and New Hamburg).
2. Provincial / inter-regional traffic through the urban centres (Stratford and Shakespeare) along Highway 7&8 interferes with their "downtown / historic crossroads" function.
3. The connection of the analysis area to transportation corridors serving other regions in the province may be inadequate for long-term transportation and economic development needs.
4. Geometric and traffic safety characteristics along Highway 7&8 should be addressed with respect to long-term traffic needs.
5. There is currently no comprehensive highway access management plan for Highway 7&8 from Greater Stratford to New Hamburg to protect highway needs and to address the GGH policy of discouraging inappropriate highway-related growth.
6. The GGH Growth Plan policy of co-ordinating transportation system planning and land use planning must be addressed.

1.2 Purpose, Relevance and Position of Report "B" Within the Study Process

The purpose of Report B is to provide baseline transportation and socio-economic data upon which the study will be built. Therefore a key focus of Report 'B' involves "looking back" at the

Study Design work and then "looking forward" through the identification of the key factors that are driving the 'Area Transportation System' needs. This will allow for the appropriate scoping of the remaining technical and consultation requirements of the Class EA and Preliminary Design components of the Study.

As can be seen in the table below, Report B is the second of 11 reports to be prepared for this study and the first report of Phase 2, Area Transportation System Planning.

Highway 7&8 Transportation Corridor Planning and Class EA Study Summary of Reports
STUDY PHASE 1: STUDY PLAN
• Report "A" Study Plan For Technical Work, Outreach And Consultation
STUDY PHASE 2: AREA TRANSPORTATION SYSTEM PLANNING
• ***Report "B": Working Paper – Overview of Transportation, Land Use and Economic Conditions Within the Analysis Area***
• Report "F" 1st Part: Working Paper - Environmental Conditions And Constraints
• Report "C": Working Paper – 'Area Transportation System' Problems and Opportunities
• Report "D": Milestone Report – Area Transportation System Alternatives
STUDY PHASE 3: PRELIMINARY PLANNING
• Report "E": Milestone Report - Transportation Corridor Needs Assessment
STUDY PHASE 4: DETAILED PLANNING FOR PROVINCIAL ROADWAYS
• Report "F" 2nd Part:: Working Paper - Environmental Conditions And Constraints
• Report "G": Working Paper – Generation of Detailed Planning Alternatives for Provincial Roadway
• Report "H": Milestone Report - Selection of Detailed Planning Alternatives for Provincial Roadway
STUDY PHASE 5: PRELIMINARY DESIGN FOR PROVINCIAL ROADWAYS
• Report "I": Working Paper - Generation of Provincial Roadway Preliminary Design Alternatives
• Report "J": Milestone Report - Selection of Preliminary/Concept Design Alternatives for Provincial Roadway
STUDY PHASE 6: TRANSPORTATION ENVIRONMENTAL STUDY REPORT
• Report "K": Transportation Environmental Study Report

Report B is designed to provide a comprehensive overview of transportation, land use and economic conditions within the analysis area. For highlights of the report, readers are referred to the following exhibits:

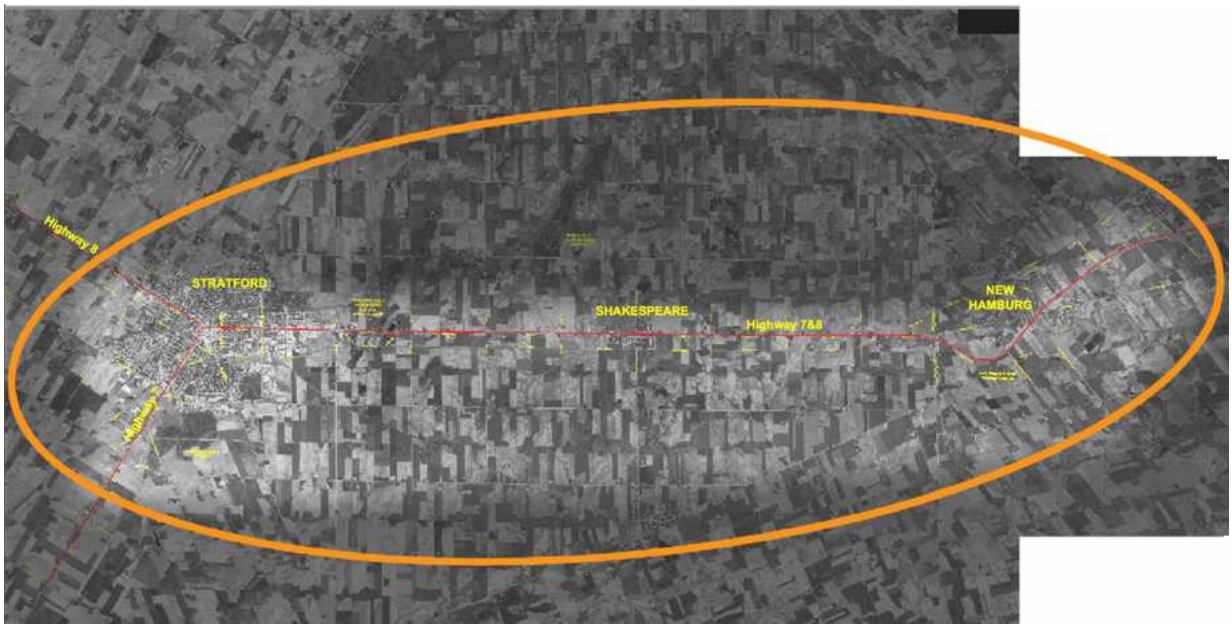
- Exhibit 4.1: Transportation Network Overview and Highway 7&8 Lane Configurations
- Exhibit 5.7: Summary of 'Area Transportation System' Current Travel Characteristics and Patterns
- Exhibit 6.2: Summary of Analysis Area Socio-Economic Existing Conditions and Outlooks
- Exhibit 7.1: Summary of Analysis Area Modal Outlooks

2.0 IDENTIFICATION OF ANALYSIS AREA

The Analysis Area has been established to identify transportation problems and opportunities associated with Highway 7&8 between Greater Stratford and the New Hamburg area. The Analysis Area is not intended to represent a Study Area for the planning alternatives to be generated during the course of the study. The Study Area will be generated by the MTO Project Team through consultation with stakeholders.

This Analysis Area is an expansion of the Analysis Area recommended by the MTO 2005 Highway 7&8 Study Design Report shown in **Exhibit 2.1**, in order to allow for the generation of a wide range of planning alternatives, taking into consideration the broader Area Transportation System.

Exhibit 2.1: Recommended Analysis Area from the Highway 7&8 Study Design Report



This Analysis Area will be refined as may be necessary through the early phases of this study based on the findings of Reports 'B', 'C', 'F', and the consultation/outreach process.

3.0 OVERVIEW OF FEDERAL, PROVINCIAL AND MUNICIPAL LAND USE, TRANSPORTATION AND ECONOMIC DEVELOPMENT POLICIES

3.1 Policy Context

In reviewing and assessing the existing and future infrastructure requirements of the Analysis Area, it is essential to establish a policy context for infrastructure expansion, considering both growth and sustainability objectives. The policy framework is the first step in developing a common vision and consistent approach to regional transportation and land use issues. The purpose of the policy framework is to assist in the development of a plan to address transportation mobility and sustaining and improving the quality of life. The assessment and evaluation of the Analysis Area problems and opportunities must be performed in the context of this framework in order to ensure that the ultimate plan is consistent with the policies and objectives of the various levels of government.

In addition to the policy context provided in this section, **Appendix A** provides a summary of the Southwestern Ontario Strategic Transportation Directions document.

3.2 Federal Policy

3.2.1 "Straight Ahead – A Vision for Transportation in Canada"

Straight Ahead culminates a period of extensive stakeholder consultation, including the 1998-99 Climate Change Table on Transportation, the Millennium Transportation Conference in 2000, and the report of the Canada Transportation Act Review Panel in 2001, after a year-long dialogue with Canadians. In June 2001, the Minister of Transport issued a report creating a Transportation Blueprint for the Next Decade and Beyond: Defining the Challenges to open a discussion with stakeholders about key policy challenges facing transportation. Realization of the vision will be demonstrated by achieving a proper balance in all our key decisions between the social, economic and environmental elements of a sustainable transportation system. This will mean continual, steady progress and the removal of major obstacles and barriers to efficiency, safety and security, environmental responsibility, access and accessibility.

3.3 Provincial Policy

3.3.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) is issued under the authority of Section 3 of the Planning Act. It provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system. The new Provincial Policy Statement came into effect on March 1, 2005. This coincides with the effective date of

Section 2 of the Strong Communities (Planning Amendment) Act, 2004, which requires that planning decisions on applications that are subject to the new PPS "shall be consistent with" the new policies.

The Provincial Policy Statement recognizes the complex inter-relationships among economic, environmental and social factors in planning and embodies good planning principles. It includes enhanced policies on key issues that affect our communities, such as: the efficient use and management of land and infrastructure; protection of the environment and resources; and ensuring appropriate opportunities for employment and residential development, including support for a mix of uses. The new policies fulfill the government's commitment to provide strong, clear policy direction on land-use planning to promote strong communities, a clean and healthy environment, and a strong economy.

MTO and municipalities share an obligation to protect highway corridors, through co-ordination of land use planning and transportation planning. The key policy statements of the PPS that support this mutual obligation are:

Section 1.6.5.2

- "Efficient use shall be made of existing and planned infrastructure"

Section 1.6.6.1

- "Planning authorities shall plan for and protect corridors and rights-of-way for transportation… to meet current and projected needs"

Section 1.6.6.2

- "Planning authorities shall not permit development in planned corridors that could preclude or negatively affect the use of the corridor for the purpose(s) for which is it was identified."

Further, in part, the PPS provides the following policies:

- **Infrastructure and Public Service Facilities**
  - Infrastructure and public service facilities shall be provided in a coordinated, efficient and cost-effective manner to accommodate projected needs.
  - Planning for infrastructure and public service facilities shall be integrated with planning for growth so that these are available to meet current and projected needs.
  - The use of existing infrastructure and public service facilities should be optimized wherever feasible, before consideration is given to developing new infrastructure and public service facilities.
  - Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services.
  - Were feasible, public service facilities should be co-located to promote cost-effectiveness and facilitate service integration.

- **Transportation Systems**
  - Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs
  - Efficient use shall be made of existing and planned infrastructure
  - Connectivity within and among transportation systems and modes should be maintained and, where possible, improved connections which cross jurisdictional boundaries
  - Transportation and land use considerations shall be integrated at all stages of the planning process

- **Transportation and Infrastructure Corridors**
  - Planning authorities shall plan for and protect corridors and rights-of-way for transportation, transit and infrastructure facilities to meet current and projected needs
  - Planning authorities shall not permit development in planned corridors that could preclude or negatively affect the use of the corridor for the purposes for which it was identified
  - The preservation and reuse of abandoned corridors for purposes that maintain the corridor's integrity and continuous linear characteristics should be encouraged wherever feasible
  - When planning for corridors and rights-of-way for significant transportation and infrastructure facilities, consideration will be given to significant natural heritage resources, water resources, agricultural resources, mineral and petroleum resources, mineral aggregate resources, cultural heritage and archaeology resources

- **Long-Term Economic Prosperity**
  - Long-term economic prosperity should be supported by (in part), providing for an efficient, cost-effective, reliable multi-modal transportation system that is integrated with adjacent systems and those of other jurisdictions, and is appropriate to address projected needs

3.3.2 Growth Plan for the Greater Golden Horseshoe

A major influence to the socio-economic environment in the analysis area is the recently published Growth Plan for the Greater Golden Horseshoe (GGH Growth Plan), released by the province on June 16, 2006, which reflects the *Places to Grow Act*'s underlying principles of intensification and reduced urban sprawl (note: only the New Hamburg area lies within the GGH). The Growth Plan promotes planning on a more regional level and sets the stage for future growth and land use scenarios by providing guidelines for municipal planning that are intended to:

- stimulate economic prosperity;
- facilitate the efficient movement of goods by linking intermodal facilities, international gateways, and communities within the GGH;
- revitalize downtowns;
- provide growth forecast objectives:

Forecasted Distribution of Population and Employment Within the Analysis Area of the Hwy 7&8 Transportation Corridor Planning and EA Study (figures in 000s, from Schedule 3 of the GGH Growth Plan)								
MUNICIPALITY	POPULATION				EMPLOYMENT			
	2001	2011	2021	2031	2001	2011	2021	2031
Region of Waterloo	456	526	623	729	236	282	324	366

- promote intensification - by the year 2015 and for each year thereafter to 2031, a minimum of 40 percent of all residential development in upper and single tier municipalities will be in the built-up area;
- designate urban growth centres which will generally be planned to achieve a minimum gross density target (the closest centres to which this applies are uptown Waterloo and downtown Kitchener);
- encourage more compact communities, with services, shops and businesses close to home;
- curb urban sprawl;
- preserve greenspace and agricultural lands that are under pressure in the GGH;
- cut down on car dependency by increasing modal share of alternatives to the automobile;
- contribute to better air quality;
- spur transit investment and create conditions favourable to public transit use; and
- promote a culture of conservation.

Through its policies, the GGH Growth Plan will impact the future land use / socio-economic environment in the analysis area, by establishing guidelines for future growth, land use (including greenspace and agriculture) and transportation objectives.

In brief, the transportation policy is to provide for the long-term multi-year needs for the movement of people and goods within the context of a balanced and integrated 'Area Transportation System', which:

a) provides adequate 'Area Transportation System' capacity, in order to serve current and projected needs of the travelling public, stimulate economic growth, and create jobs;
b) ensures that the corridors necessary for the various travel modes of the 'Area Transportation System' are identified and protected, in order to maintain and improve transportation linkages;
c) is co-ordinated and consistent with land-use related growth objectives, in order to reflect the impact of designation of areas as urban growth centres, major transit station areas, settlement areas, built-up areas, intensification areas and corridors, non-urban areas, greenfield areas and greenbelt; and
d) in addition, for areas within the geographic boundary covered by the GGH Growth Plan, has the following attributes:
    (i) considers both the connectivity of modes, and the separation of modes within corridors, in order to provide access to the various modes of the 'Area Transportation System' that allows people choices by reducing reliance on any single mode;
    (ii) puts the transit component of the 'Area Transportation System' (GO Transit, provincial transitways, other inter-city transit) as the first investment priority in order to support growth in a compact and efficient form;

(iii) puts goods movement as the first investment priority in the provincial highway component of the 'Area Transportation System', in order to service cities and other major centres of population, priority truck routes leading into those communities, and major regional facilities for primary goods movement such as intermodal facilities.

3.4 Municipal Policy

In addition to provincial and federal policies, the local official plans will be considered in the context of the Highway 7&8 corridor. These plans are described in the following sections.

3.4.1 Region of Waterloo Official Plan

The eastern part of the analysis area falls within the Region of Waterloo. The Region of Waterloo OP was approved by the Ministry of Municipal Affairs and Housing on November 23, 1995 and further approved and amended on September 30, 2006. This part of the Region also falls entirely within the Township of Wilmot.

3.4.2 Township of Wilmot Official Plan

The eastern part of the analysis area falls within the Township of Wilmot. The Regional Municipality of Waterloo approved the Township of Wilmot Official Plan with modifications on July 7, 2004.

3.4.3 County of Perth Official Plan

The central and western parts of the analysis area are located in the County of Perth, specifically within the Townships of Perth East and Perth South. The County of Perth Official Plan (OP) was adopted by Council on December 11, 1997 and was approved by the Ministry of Municipal Affairs and Housing on June 12, 1998 and the Ontario Municipal Board on March 29, 1999.

3.4.4 City of Stratford Official Plan

The City of Stratford is located in the western part of the analysis area. The City of Stratford Official Plan was adopted by Stratford Council on January 25, 1993 and approved with modifications by the Minister of Municipal Affairs and Housing on November 28, 1994.

4.0 DEFINITION AND DESCRIPTION OF 'AREA TRANSPORTATION SYSTEM'

The Area Transportation System comprises the area transportation facilities and linkages for the movement of people and goods, by all modes and all jurisdictions, between multiple regions of the province and/or between cities and other major centres of population, or which function to complete such primary transportation linkages, with an emphasis on connections to:

- Cities and other major centres of population that contain designated urban growth centres;
- Cities and other major centres of population that contain designated major transit service/station areas;
- Major regional facilities for primary goods movement, such as intermodal facilities; and international airports, major ports and international gateways.

The Regional transportation system in and around the Highway 7&8 Corridor comprises automobile/truck modes, pedestrian/cycling modes, and rail, bus, and air to meet inter-city passenger needs. Major freight transportation modes include truck and rail.

Automobile traffic using the provincial highway system is by far the predominant mode of travel, accounting for more than 90% of the passenger kilometers travelled. The remaining transportation modes (bus, rail, air, cycling, and walking) account for 7.5% of the passenger kilometers travelled.

The Analysis Area can be considered a conduit for trade and tourism between the Greater Toronto Area, and southwestern Ontario and the United States. International trade and goods movement through this area into Canada's economic heartland are critical to the local, regional and provincial economies. The efficiency of the provincial highway system, in and through the Analysis Area is therefore essential to the economic prosperity that the area has experienced.

Transportation has been essential in supporting the continued economic prosperity of the Greater Golden Horseshoe Area, and more specifically the Region of Waterloo, the County of Perth and the City of Stratford. This prosperity is due in part to the existing provincial, and municipal transportation systems, and the network of other modes, namely railways, airports, and marine transport.

Growth in the transportation corridor is dependent on a number of discreet but related socio-economic factors, such as: population and employment, demographic characteristics, and national, provincial, regional trends. Each of these factors acts upon the characteristics of travel demand with different and varying effects. In order to assess the needs of the Area Transportation System, the first step is to establish the factors that define the environments in the Analysis Area. These factors become the framework for the quantification of role and function of the transportation system.

The following subsections provide a profile of the existing transportation services in the greater Analysis Area, focusing on facilities that accommodate longer distance inter-city/inter-county/regional trips. The profile of each mode describes current service levels and the role and function within the context of the provincial transportation system.

4.1 Highway Network

Provincial, Regional and Municipal roads in Southern Ontario service an ever increasing demand of road transportation by providing an intercity network of links used for the transport of goods and people. The automobile continues to be the preferred mode of travel in Southern Ontario. Auto ownership rates have been growing at a rate faster than population growth over the previous decades with the popularity of suburban life being a major contributor.

Trucking is a principal means of goods transport in Southern Ontario with highways linking to all major manufacturing centres and international border crossings. The demand for truck transport remains a competitive mode of goods distribution. Trucking provides intermodal goods transport connectivity between rail and marine transport facilities and provincial freeways.

The provincial/highway network within the Analysis Area consists of sections of the following:

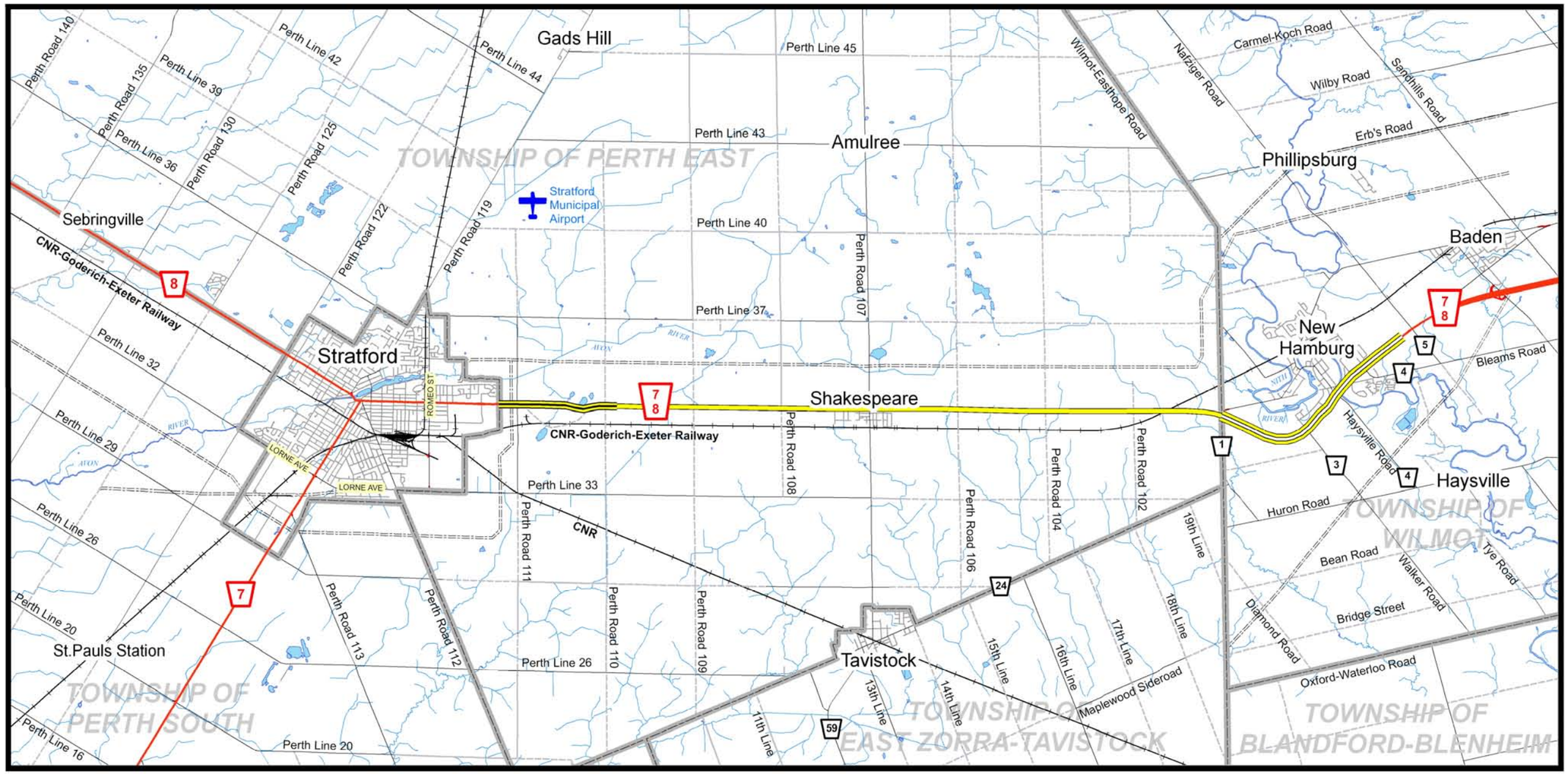
- Highway 7&8;
- Highway 7; and
- Highway 8.

Highway 7&8 is a key component of the provincial highway system that provides an east-west linkage connecting Stratford, New Hamburg and the Lake Huron Shoreline with major centres in Central Ontario, including the Kitchener/Waterloo/Cambridge area, London and the Greater Toronto Area (GTA). Given the urban centres and proximity to vacation areas, there is a combined economic, commuter and vacation/recreation focus to the travel occurring within this section of the Highway 7&8 corridor.

Highway 7 extends from Guelph to Stratford and continues southwest through Stratford as a four-lane road. South of the Stratford urban limits, Highway 7 transitions to a two-lane rural arterial undivided roadway and provides a connection to Highway 4 in the London area, passing St. Marys.

Highway 8 extends from Hamilton, connecting the Kitchener/Waterloo/Cambridge area with Stratford from the west. Northwest of Stratford, Highway 8 is a two-lane rural arterial undivided roadway, which continues northwest through to Goderich and Lake Huron.

Exhibit 4.1 – Transportation Network Overview and Highway 7&8 Lane Configurations



Highway 7 & 8 Study Design
Greater Stratford to New Hamburg Area
W.P. 13-00-00

URS

Transportation Network Overview and Lane Configurations

- Four-lane Rural Arterial Undivided Roadway
- Four-lane Rural Arterial Divided Roadway
- Two-lane Rural Arterial Undivided Roadway
- Freeways
- Provincial Highways
- Regional and County Roads
- Paved Streets
- Unpaved Surface
- Railway Lines
- Utility Lines

Kilometers
0 1 2 3 4 5

4.2 Municipal Network

There is a well-established municipal road network within the Analysis Area, with a number of parallel east-west routes to the north and south of Highway 7&8, as illustrated in Exhibit 4.1. Given the nature of the road network in the vicinity of the Highway 7 & 8 corridor as well as reduced speeds required to travel through the town of Stratford, a number of trips that use Highway 7 & 8 bypass Stratford by following a path to the north or south of Highway 7 & 8 (e.g. Perth Line 37, Perth Line 33, Perth Line 26, etc.) for part of their trip.

The City of Stratford has expressed concerns with the significant amount of truck traffic that is passing through the core of the City via Highway 7&8, and has designated C.H. Meier Boulevard, Lorne Avenue and Romeo Street as "voluntary designated truck routes", which are used to bypass downtown Stratford. In addition, the County of Perth has expressed concerns with the degree of residential traffic that is destined for locations east of Stratford, and is utilizing parallel routes to the north of Highway 7&8, such as Perth Line 37, to avoid traffic delays in Stratford.

4.3 Rail Network

The Goderich-Exeter Railway corridor runs parallel to Highway 7&8 from Stratford easterly to Kitchener. The railway is generally located 400 m south of Highway 7&8 from Stratford to approximately 1.5 km west of the intersection with Waterloo Regional Road 1 where the railway crosses the highway. This rail corridor then extends eastward paralleling Highway 7&8 to the north through New Hamburg.

This section of rail carries approximately 8 to 10 trains per day. The volume of rail traffic consists of both freight and passenger trains. The trains using this rail corridor are traveling from destinations to the west, from as far as Sarnia and Chicago, and from Toronto in the east. Via Rail and Amtrack use this track for their passenger service.

4.4 Bus Service

Within the Analysis Area, both public and inter-city transit is limited. Currently, the only inter-city bus service provider in the area is Greyhound Bus Lines, which has only one bus terminal in the Study Area (located in downtown Stratford). Municipal public transit is only available within the City of Stratford, and offers a limited number of routes through the outer residential areas in the greater Stratford area.

With regard to future transit improvements, the province recently announced that GO Transit bus service will be expanded to the Kitchener-Waterloo area. While future transit expansion may lead to increased capacity of transit networks, it is not anticipated that the capacity of the overall transportation network in the vicinity of Highway 7&8 corridor will be sufficiently increased to eliminate the need for roadway improvements.

Enhancing the role of transit in the Highway 7&8 corridor would help to achieve the provincial and municipal policy objectives for sustainable transportation and environment.

4.5 Airports

Stratford Municipal Airport

The Stratford Municipal Airport is a domestic airport located approximately 6 km northeast of the City of Stratford in the Township of North Easthope within the County of Perth. The airport is equipped to handle air traffic ranging from Dash 8s to helicopters. Corporate, freight, training and recreational flights make up the approximate 12,000 annual aircraft movements.

Region of Waterloo International Airport

The Waterloo Regional Airport is located northwest of the Analysis Area, approximately 15 kilometers north of Highway 401, via the existing road network. The airport provides scheduled international (Detroit) and charter passenger service via small commuter aircraft. Passengers seeking national or international destinations via larger passenger airliners are serviced through Toronto Pearson Airport approximately one hour east. The Waterloo Airport facility accommodates cargo, business charter and flight training along with necessary service facilities. The airport has no direct access to a "400 Series" Highway.

4.6 Marine

Four major ports are also located within two hours trucking time of the Analysis Area, specifically Goderich, Toronto, Port Stanley, and Hamilton.

5.0 DESCRIPTION OF 'AREA TRANSPORTATION SYSTEM' CURRENT TRAVEL CHARACTERISTICS AND TRAVEL PATTERNS

As part of the Highway 7&8 Study Design assignment, a Transportation Needs Assessment was undertaken to develop a general understanding of the existing and future transportation and environmental conditions within the subject section of the Highway 7&8 corridor. The work included an Origin-Destination Travel Survey (O-D Travel Survey) to provide information with respect to the existing travel patterns within the Study Area, and to facilitate an assessment of the existing and future traffic transportation conditions. In addition, collision analysis and a level-of-service analysis was undertaken to identify existing and future transportation capacity deficiencies corresponding to the 10, 20 and 30-year planning horizons.

The results of the Origin-Destination Travel Survey and traffic operations analysis are summarized below, with the details provided in the following reports available under separate cover:

- Origin-Destination Survey Report, dated November 2005, prepared by IBI Group; and
- Highway 7&8 Traffic Operations Report, dated May 2005, prepared by URS Canada Inc.

A detailed review of 2006 traffic data is currently underway. The results of the assessment will be documented in the final version of Report B.

5.1 Highway 7&8 Mainline Traffic Volumes

For mainline traffic volume reporting purposes, the Analysis Area section of Highway 7&8 was divided into the following six sections:

- Stratford Limits to 2.9 km East
- 2.9 km East of Stratford Limits to Perth Road 107
- Perth Road 107 to Waterloo Regional Road 1
- Waterloo Regional Road 1 to Waterloo Regional Road 4 (West Junction)
- Waterloo Regional Road 4 (West Junction) to Waterloo Regional Road 4 (East Junction)
- Waterloo Regional Road 4 (East Junction) to Waterloo Regional Road 5

Available turning movement counts were obtained from the MTO for the key intersections within the project limits. The MTO turning movement count surveys were conducted during the period of 2002 to 2004. Additional turning movement counts at key intersections within the study area where recent data was not available were conducted by OTI, on behalf of URS, in January 2005. All turning movement counts were adjusted to correct seasonal variation for the time of year they were undertaken and normalized to reflect 2004 base year traffic conditions.

The travel patterns derived by the Origin-Destination Travel Survey indicate that Highway 7&8 becomes increasingly commuter oriented moving from west to east through the study corridor.

From the east limits of the City of Stratford to Waterloo Road 1, Highway 7&8 serves commuters, tourists and recreational travelers. For the section between Waterloo Road 1 and the west junction of Waterloo Road 4, Highway 7&8 serves primarily commuters and recreational travelers. East of the west junction of Waterloo Road 4 to the east end of the Study Area (0.8 km east of Waterloo Road 5), the highway is primarily a commuter route.

The existing traffic conditions on Highway 7&8 are summarized in **Exhibit 5.1** in terms of the *Average Annual Daily Traffic (AADT)* and the *Design Hour Volume (DHV)*. The AADT represents the average traffic volume on a given road segment over a 24-hour period, for a particular year. The DHV is a measure of the 30th highest hourly traffic volume for a particular year. The existing traffic volumes presented in **Exhibit 5.1** were derived on the basis of recent traffic counts conducted in the Analysis Area in the summer of 2004.

Exhibit 5.1: Highway 7&8 Mainline Existing Traffic Volumes (2004)

Highway 7&8	2004 Average Annual Daily Traffic (AADT)	2004 Design Hour Volume (DHV)
Stratford City Limits to 2.9 km East of Stratford City Limits	9,800	980
2.9 km East of Stratford City Limits to Perth Road 107	9,800	980
Perth Road 107 to Waterloo Road 1	10,600	1,060
Waterloo Road 1 to Waterloo Road 4 (West Junction)	13,800	1,380
Waterloo Road 4 (West Junction) to Waterloo Road 4 (East Junction)	19,800	1,980
Waterloo Road 4 (East Junction) to 0.8 km East of Waterloo Road 5	18,400	1,840

As can be seen in **Exhibit 5.1**, there is a significant increase in traffic volumes east of the west junction of Waterloo Road 4 to the east study limits. This is likely the result of significant local traffic volumes along this section of the highway. A review of the existing turning movement traffic volumes at the west junction of Waterloo Road 4 indicate that there are significant southbound traffic volumes on Peel Road/Haysville Road during the morning peak period, which turn left turn onto Highway 7&8 to go eastbound. Some of this traffic then turns right onto Hamilton Road/Bleams Road (at the east junction of Waterloo Road 4), but the majority of the traffic continues easterly toward the Kitchener/Waterloo/Cambridge area. This pattern is reversed during the afternoon peak period. Given the significant population and employment growth that is projected in the New Hamburg area over the coming years, it is anticipated that the increased volumes through this section of the highway will continue to increase and become more pronounced.

5.2 Highway 7&8 Mainline Analysis

To assess the existing traffic operations on Highway 7&8, a level-of-service (LOS) analysis was undertaken using the methodology described in the *Highway Capacity Manual*. The two-lane

cross-section segment of Highway 7&8 was analyzed as a Class I highway. Level-of-Service is a key highway performance measure reflecting the quality of the service provided to users and the effectiveness of traffic operations. The LOS takes into consideration a range of factors including the design hour volume, design speed, volume-capacity ratio, road geometrics and the percentage commercial vehicles within the traffic flow. The following summarizes the various level-of-service classifications:

Level-of-service A - Free flow operations, with vehicles almost completely unimpeded.

Level-of-service B - Reasonably free flow conditions. Manoeuverability is only slightly impeded.

Level-of-service C - Stable operations, but represents the start of the range where small increases in volume will significantly affect service and great care and awareness is required to manoeuver within the traffic stream.

Level-of-service D - High density, but stable flow, where small increases in traffic will generally cause operational problems. The ability to manoeuver is severely restricted.

Level-of-service E - Operating conditions are near or at capacity. Travel speeds are greatly reduced to a low, but relatively uniform level. Manoeuverability is extremely difficult.

Level-of-service F - Operating conditions are over capacity, with the volume of traffic approaching a particular location exceeding the volume of traffic that can be accommodated at that location. This condition is characterized by the formation of traffic queues, and is also considered by the Ministry to represent unacceptable operational conditions for provincial highways.

The findings of the existing level-of-service assessment are presented in **Exhibit 5.2**. Given the strategic significance of the Highway 7&8 corridor from a commuter, commercial and tourism/recreational perspective, acceptable LOS was defined as LOS 'C' or better and undesirable LOS was defined as LOS 'D' or worse.

Exhibit 5.2: Existing Highway 7&8 Mainline Traffic Operations

Highway 7&8	Cross-Section	Existing Operations (LOS)
Stratford City Limits to 2.9 km East of Stratford City Limits	4-Lane	A
2.9 km East of Stratford City Limits to Perth Road 107	2-Lane	D
Perth Road 107 to Waterloo Road 1	2-Lane	D

Highway 7&8	Cross-Section	Existing Operations (LOS)
Waterloo Road 1 to Waterloo Road 4 (West Junction)	4-Lane	A
Waterloo Road 4 (West Junction) to Waterloo Road 4 (East Junction)	4-Lane	N/A*
Waterloo Road 4 (East Junction) to 0.8 km East of Waterloo Road 5	4-Lane	A

* Level-of-Service is influenced by urban-type conditions and defined by intersection operations within the segment

As can be seen in **Exhibit 5.2**, the Highway 7&8 mainline is operating within acceptable levels of service along the assessed four-lane highway sections of the highway, but with poor levels of service along the existing two-lane section of the highway.

The section of Highway 7&8 from 2.9 km East of Stratford Limits to Waterloo Regional Road 1 is currently operating at LOS D. Based on an analysis of the warrant for passing lanes along the two-lane section of Highway 7&8, a condition of lane obsolescence has been identified. This condition occurs when there are a high percentage of slow moving vehicles, and thus the benefit of providing passing lanes is negated since queues will typically accumulate immediately after the termination of the passing lane. Under such conditions, there is no benefit to providing passing lanes and the required capacity improvement involves the provision of additional 'through' lanes, either through widening of the existing highway to four lanes or the construction of a new parallel arterial highway corridor.

For the four-lane section of Highway 7&8 between the east and west junctions of Waterloo Road 4, mainline operations were not assessed in terms of LOS since traffic operations along this section of the highway are a function of traffic signal controls. As such, an analysis of both signalized intersections was undertaken, and mainline operations between the intersections were assessed based on a review of lane capacity. The results of the intersection operations analysis are presented in **Section 5.3**.

The four-lane segment of Highway 7&8 from Waterloo Road 1 to 0.8 km east of Waterloo Road 5 was reported to operate at LOS A under existing conditions. It should be noted that this section was analyzed as a multilane highway; however, traffic operations along this corridor segment in the urban New Hamburg environs are a function of traffic signal controls at some locations. As such, an analysis of the signalized intersections was undertaken to provide for a more indicative account of traffic operations within this segment of Highway 7&8. The results of the intersection operations analysis are presented in **Section 5.3**.

It has been reported that operational issues currently exist within the Waterloo Road 1 to 0.8 km east of Waterloo Road 5 segment of the corridor. Mainline operations in an urban environment are often based on a review of lane capacity. In this case, the typical lane capacity is 900 vehicles per hour per lane, which reflects impediments due to factors such as traffic signals as well as turns at entrances and intersections. Assuming a directional two-lane capacity of 1,800 vehicles

per hour within the corridor and the 2004 base year DDHV of 1070, it appears that widening the corridor along this segment is not currently required. Intersection operations are documented in the following sections.

5.3 Existing Intersection Volumes and Operations

Twenty-one side roads intersect Highway 7&8 between the Stratford City Limits and Waterloo Road 5, thirteen of which were identified as key intersections. The 2004 A.M. and P.M. peak hour intersection volumes are presented in **Exhibits 5.3** and **5.4**.

Exhibit 5.3: 2004 A.M. Peak Hour Intersection Volumes

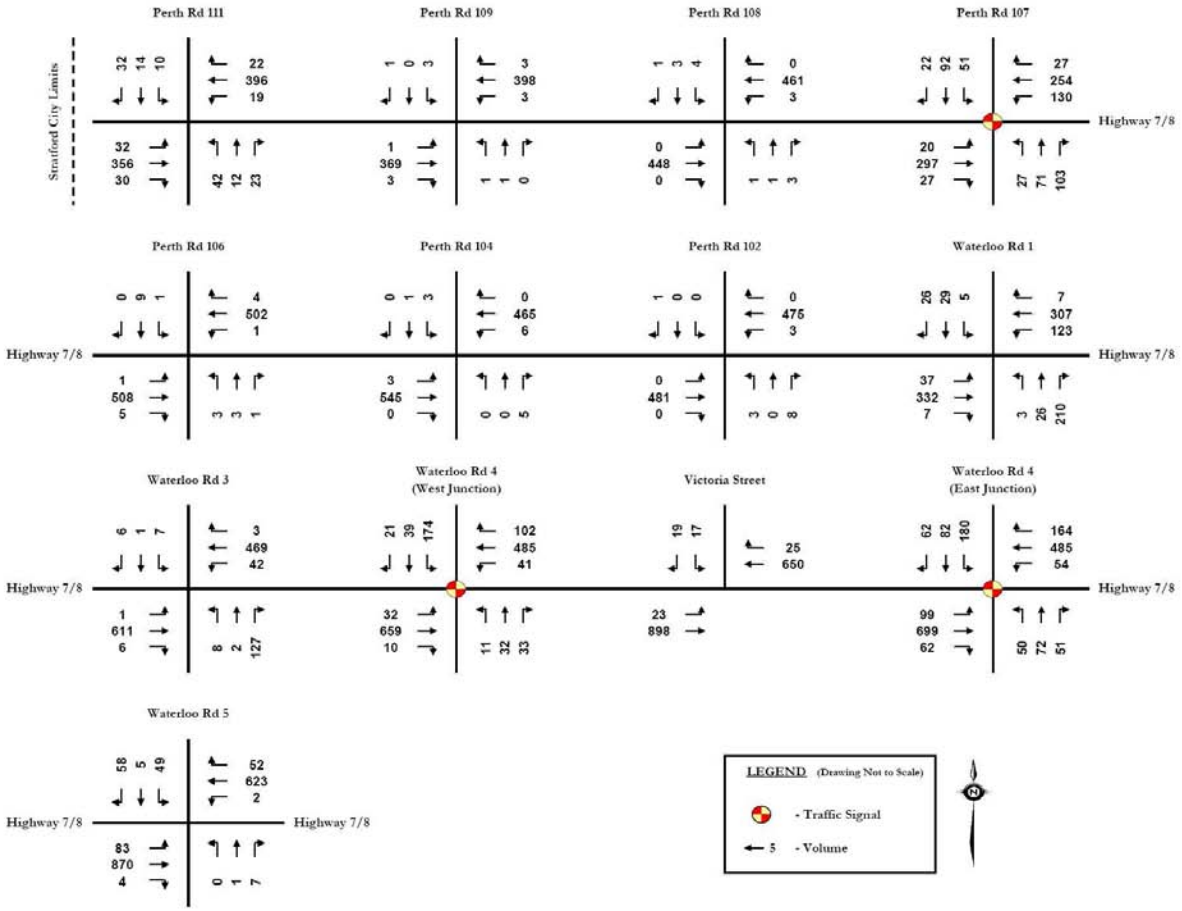
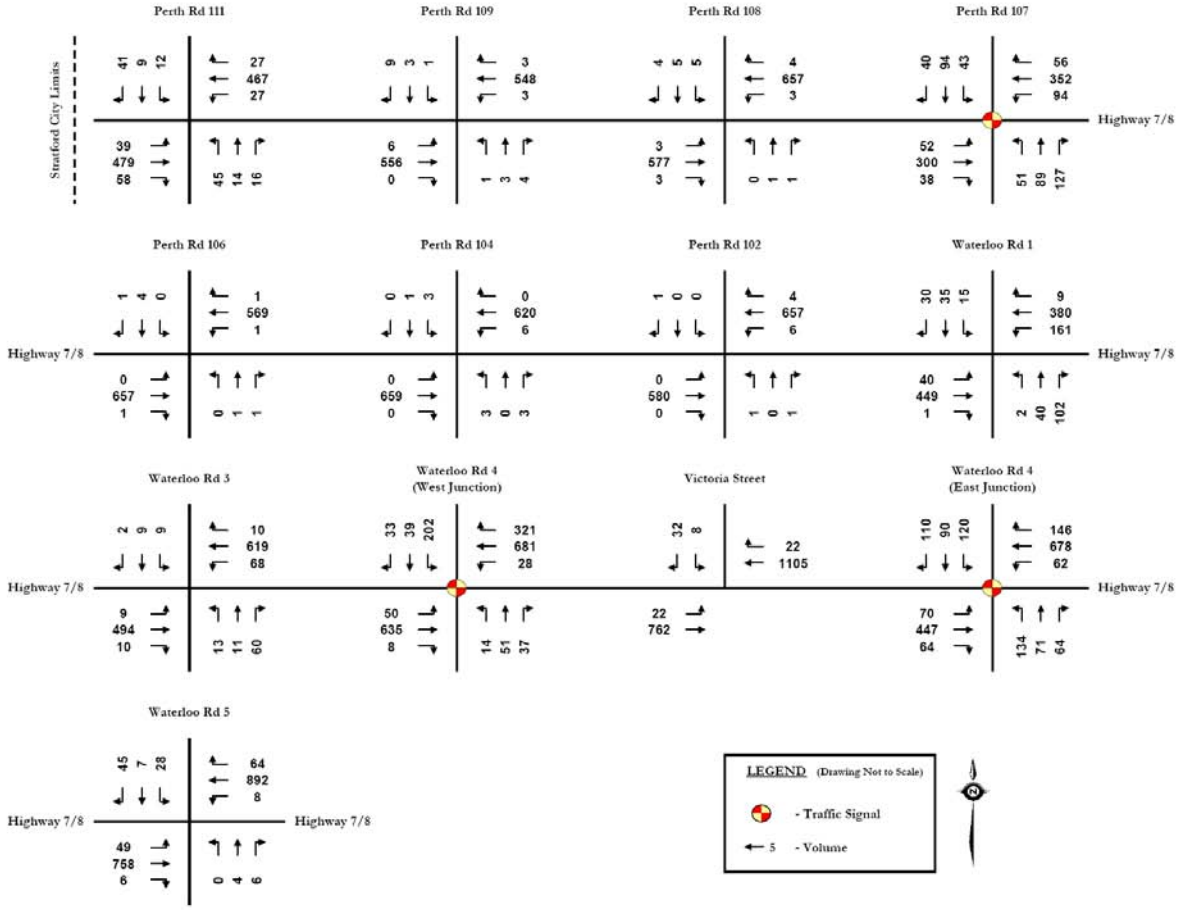


Exhibit 5.4: 2004 P.M. Peak Hour Intersection Volumes



Signalized and unsignalized intersection operation analysis was undertaken using Highway Capacity Software, 2000 (HCS) based on methodologies outlined in the *Highway Capacity Manual, 2000*, published by the Transportation Research Board. Detailed level of service definitions pertaining to intersection operations, as described in the *Highway Capacity Manual, 2000*, are contained in *Appendix 1 - Level of Service Definitions* of the Traffic Operations Report, dated May 2005. Intersection operations for existing conditions are summarized below in **Exhibit 5.5**.

Exhibit 5.5: 2004 Intersection Operations

Highway 7&8 Intersection		Operations (LOS, Delay, and v/c Ratio)*	A.M. Peak Hour	P.M. Peak Hour
Perth Road 107	Existing Signal Timings	Intersection	D, 41 s, 0.56	F, 81 s, 0.76
		Critical Movements	SB LTR	NB TR SB LTR
	Optimized Signal Timings	Intersection	B, 14 s, 0.47	B, 16 s, 0.57
		Critical Movements	-	-
Perth Road 106		Intersection	D, 28 s, 0.06	C, 25 s , 0.03
		Critical Movements	-	-
Perth Road 104		Intersection	C, 24 s , 0.02	E, 37 s, 0.03
		Critical Movements	-	SB LTR
Perth Road 102		Intersection	B, 15 s , 0.03	C, 23 s, 0.01
		Critical Movements	-	-
Waterloo Regional Road 1		Intersection	D, 28 s, 0.16	F, 61 s, 0.59
		Critical Movements	-	NB TL SB LTR
Waterloo Regional Road 3		Intersection	C, 20 s, 0.06	D, 34 s, 0.14
		Critical Movements	-	-
Waterloo Regional Road 4 (West Junction)	Existing Signal Timings	Intersection	B, 16 s, 0.56	B, 17 s, 0.58
		Critical Movements	-	SB L
	Optimized Signal Timings	Intersection	B, 13 s, 0.45	B, 15 s, 0.49
		Critical Movements	-	-
Victoria Street		Intersection	C, 22 s, 0.15	C, 24 s, 0.18
		Critical Movements	-	-
Waterloo Regional Road 4 (East Junction)	Existing Signal Timings	Intersection	B, 19 s, 0.61	B, 20 s, 0.52
		Critical Movements	-	-
	Optimized Signal Timings	Intersection	B, 18 s, 0.57	B, 17 s, 0.50
		Critical Movements	-	-
Waterloo Regional Road 5		Intersection	F, 87 s, 0.80	F, 95 s, 0.74
		Critical Movements	SB LTR	NB LTR SB LTR

* For unsignalized intersections, the overall intersection operations are stated for the approach or movement with the worst level of service and highest delay.
** For unsignalized intersections, the overall intersection operations are stated for the approach or movement with the worst level of service and highest delay.
At signalized intersections, movements with a v/c ratio greater than 0.85 or an average vehicle delay greater than 55 seconds are defined as critical. At unsignalized intersections, movements with a v/c ratio greater than 0.85 or an average vehicle delay of greater than 35 seconds are defined as critical movements.

Under existing conditions, most of the key intersections along Highway 7&8 are operating within acceptable levels of service during the a.m. and p.m. peak hours.

There are some exceptions at the unsignalized intersections where there are high turning volumes to / from the side street. These include Perth Road 111, Waterloo Road 1, and Waterloo Road 5. In all these cases the critical movements are for the northbound and / or southbound approaches. Thus, eastbound and westbound approaches are operating well; however, notable delays and / or high v/c ratios are experienced on the side streets. There are limited opportunities to improve

these conditions, all of which must be cognizant of the minimal side street approach volumes. An onerous potential improvement alternative would be to close some intersections in order to consolidate traffic volumes at a particular location to such a degree that signals would be warranted. However, this is an unlikely and unfeasible solution since it involves road closures, purchase of access rights, and negatively impacts travel patterns for motorists in the area.

The operations at the signalized intersections (Perth Road 107, and West and East Junctions of Waterloo Regional Road 4) revealed LOS 'D' or better, with the exception of the Perth Road 107 intersection during the p.m. peak hour, which was found to be operating at LOS 'F'. It is noted that optimization of the signal timing at these locations resulted in improved intersection operations with no critical movements.

The intersection operations at the signalized Waterloo Road 4 – West Junction and Waterloo Road 4 – East Junction intersections have a residual effect upon the corridor operations of Highway 7&8 in the subject segment. As intersection operations for the 2004 base year conditions appear to be acceptable at the Waterloo Road 4 intersections, mainline operations of Highway 7&8 within this segment are expected to be adequate. Further, as mentioned previously, the DDHV of 1,070 is below the assumed directional two-lane capacity of 1,800 vehicles per hour, which was derived in consideration of signal timing requirements within the corridor.

5.4 Collision Analysis

A collision analysis was conducted during the Study Design process to better understand existing safety conditions along the Highway 7&8 corridor within the study limits. In undertaking this analysis, the Project Team reviewed available historic collision data from the Ministry's Accident Information System (AIS), which is based on Ontario Provincial Police Reports, for the most recent five-year period (1999 to 2003).

The data was analyzed in terms of: total collisions over the five-year period, average number of collisions per year, types of collisions, contributing factors (e.g. weather conditions, pavement conditions, time of day, etc.), collision frequency, etc. The latter measure was calculated as an average collision rate per year, and was measured as the number of collisions per million vehicle kilometres (MVK) travelled on the highway.

There were a total of 312 reported collisions between 1999 and 2003 on Highway 7&8 within the study limits. Approximately half of these collisions were associated with mainline operations, and the other half were intersection-related. There were a total of eight fatal collisions within this timeframe.

The annual collision rates for the different segments of Highway 7&8, measured in collisions per million vehicle kilometres (CMVK), are presented in **Exhibit 5.4.** These rates are compared to the Provincial Accident Rate (PAR) of 0.7 collisions per million vehicle kilometres for a King's Highway.

Exhibit 5.6: Historical Collision Rates for Highway 7&8 (1999 – 2003)

Highway 7&8	Number of Collisions	Length of Segment (km)	Number of Years	Collision Rate (CMVK)	Provincial Accident Rate (PAR)
Stratford City Limits to 2.9 km East of Stratford City Limits	28	2.9	5	0.53	0.7
2.9 km East of Stratford City Limits to Perth Road 107	62	5.8	5	0.59	0.7
Perth Road 107 to Waterloo Road 1	91	8.2	5	0.58	0.7
Waterloo Road 1 to Waterloo Road 4 West Junction)	36	3.3	5	0.46	0.7
Waterloo Road 4 West Junction) to Waterloo Road 4 East Junction)	47	0.9	5	1.53	0.7
Waterloo Road 4 (East Junction) to 0.8 km East of Waterloo Road 5	48	2.2	5	0.68	0.7
Highway Overall	312	23.3	5	0.63	0.7

As shown in **Exhibit 5.6**, all segments within the study limits were generally found to have a collision rate below the provincial average, with the exception of the segment between the east and west junctions of Waterloo Road 4, which exhibited a collision rate of 1.53. The high collision experience in this segment is primarily associated with the traffic signals and significant turning volumes at the Waterloo Road 4 – East Junction and Waterloo Road 4 – West Junction intersections, as well as the turning volumes at the Victoria Street intersection. There were a significant number of rear-end and turning collisions recorded in this segment.

In addition to computing average annual collision rates for each of the six broader sections of Highway 7&8, the Project Team identified locations where there appeared to be a higher incidence of collisions. In order to identify these locations, an interim collision rate was computed for each kilometre of the corridor and then compared to the Provincial Accident Rate. Collision rates exceeding the PAR of 0.7 CMVK were identified as Collision Prone Areas (CPA's). It is important to note that this approach was used only as a means of distinguishing areas with higher collision incidence, as the direct comparison of these "1 km" collision rates to the Provincial Average is not statistically appropriate.

This exercise resulted in the identification of eight Collision Prone Areas along mainline Highway 7&8 requiring closer consideration. These locations included:

- Highway 7&8 / Waterloo Road 5;
- The section between the east and west junctions of Waterloo Road 4;
- Waterloo Road 1;
- Perth Road 102;
- Perth Road 107;
- Perth Road 108;

- Perth Road 110; and
- The section between Forest Road (West Junction) and Perth Road 111.

In summary, the collision analysis determined that most collisions involved a single passenger vehicle traveling on a straight level segment of Highway 7&8, which resulted in property damage only. Although most collisions occurred during the day, one quarter of the total number of collisions occurred at night. Slippery road surface conditions (e.g. wet, ice) and less than ideal weather conditions were also significant contributing factors.

It should also be noted that some public concerns were raised at both Public Information Centres held during the Study Design process with respect to safety conditions at locations where the highway transitions from four lanes to two lanes east of Stratford and at Waterloo Road 1. At these locations, there have been observations of motorists on the four-lane section of the highway accelerating to pass a slow moving vehicle before entering the two-lane section. This presents problems not only for motorists on Highway 7&8, but also for motorists on the sideroads (e.g. Waterloo Road 1) that are attempting to turn on to Highway 7&8.

5.5 Summary of Area Transportation System Current Travel Characteristics and Patterns

Area transportation system current travel characteristics are summarized in **Exhibit 5.7** below.

Exhibit 5.7: Summary of Area Transportation System Current Travel Characteristics and Patterns

Origin-Destination Patterns:

- Work/business trips comprise 49% of weekday travel with an average trip length of 36 km
- More than half of all work/business trips in the corridor start or end in the Stratford area (including east Stratford and Shakespeare)
- The Stratford area draws workers from throughout Perth County, Kitchener/Waterloo/ Cambridge area, London and beyond
- New Hamburg and Baden also serves as a smaller employment centre with a significant portion of work/business trips starting or ending in west Wilmot Township. Over half of all work/business trips in the corridor are less than 25 km in length
- Recreation/vacation travel comprises 24% of Sunday trips and 9% of weekday trips with the Lake Huron shore the main destination including areas such as Grand Bend, Pinery Provincial Park, Bayfield and Goderich
- The majority of these trips are made by residents of Guelph and Waterloo Region with the area also drawing from London, Guelph, GTA and Hamilton areas

Exhibit 5.7: Summary of Area Transportation System Current Travel Characteristics and Patterns

Traffic Volumes/Operations:

- Poor level of service along 2-lane section of Highway 7&8 between Stratford and New Hamburg due to increasing traffic volumes
- Highest hourly traffic volumes on Highway 7&8 occur during the commuter periods
- Weekday daily volumes range from 9,800 vehicles per day (vicinity of Stratford) to 19,800 vehicles per day (New Hamburg area)
- Low to moderate seasonal variation in traffic volumes on Highway 7&8

Mode of Travel:

- More than 90% of the daily travel in the Highway 7&8 corridor is by automobile
- Highway 7&8 through the Analysis Area is a key trucking route

6.0 DESCRIPTION OF ANALYSIS AREA – SOCIO-ECONOMIC EXISTING CONDITIONS AND OUTLOOKS

The Analysis Area consists predominantly of rural land use with three main population centres: New Hamburg in the east end of the Study Area, Shakespeare toward the centre of the Study Area and Stratford in the west end. Highway 7 & 8 passes through all three of these population centres. These population centres are located within four municipalities in the Study Area: the Township of Wilmot (which includes the Town of New Hamburg, and is located within the Regional Municipality of Waterloo), the Townships of Perth East (which includes Shakespeare) and Perth South (both within the County of Perth), and the City of Stratford.

Stratford, with a population of approximately 30,000 is the primary urban centre in the Study Area. The city mixes a very strong local tourism industry with a small manufacturing base and a commercial sector that serves as a local centre for retail and service industries. In addition the Study Area is located adjacent to a medium-size urban centre (Kitchener/Waterloo/ Cambridge), and is approximately one hour from the Greater Toronto Area. This proximity presents ready markets for Study Area businesses, particularly for the auto parts industry centred in Stratford. Highway 7 & 8 is the most important road link to these markets from the Study Area.

In addition, nine U.S. border crossings are within 2.5 hours trucking time from Stratford (these crossings are located in five communities - Niagara Falls, Fort Erie, Queenston/Lewiston, Sarnia, Windsor). Almost all routes to these crossings (from the Study Area) are via facilities where congestion is not a significant problem, as all routes to the U.S. from the Stratford area avoid the congestion of the GTA/Hamilton urban area. Four major ports are also located within two hours trucking time: Goderich, Toronto, Port Stanley, and Hamilton. This transportation accessibility is one potential advantage for locating businesses with national or international markets in the Analysis Area.

6.1 Population

At 30,000, the City of Stratford has roughly the same population as the three rural Townships combined. However, a substantial portion of the population of the Township of Wilmot lives within the urban shadow of the Kitchener/Waterloo/Cambridge area, primarily in the bedroom communities of New Hamburg (pop. 6,000) and Baden (pop. 1,800). These towns have become the site of recent residential development. These two communities are also economically and socially linked in many ways to the urban area to the east. Further to this, a substantial portion of the population of the Township of Perth East lives within the urban shadow of Stratford. This population is most likely served by shops and services located within Stratford and therefore probably do not constitute separate economic markets from Stratford.

Perth East and Perth South have essentially stable populations, with little growth or decline. Wilmot, by comparison, has grown rapidly, likely as a result of the urban shadow effect from the Kitchener/Waterloo/Cambridge area. Wilmot's settlement areas have been the location of this growth: New Hamburg's population increased from 4,600 in 1991 to 6,000 in 2001; while Baden

has increased from 1,500 to 1,800. Population projections for the Township indicate substantial growth in coming years, from a population of 14,866 in 2001 to a population of 22,300 by 2016.

Stratford has seen modest population growth. The City estimates the population in 2004 to be 30,408, an increase of about 750 people since the Census in 2001. Population projections for the City indicate continued modest growth over the coming decades. The number of housing starts in Stratford has been in the same range (100-150 units per year) as in the Township of Wilmot, for the past several years.

6.2 Employment

The Analysis Area is characterized by very low unemployment rates. The three rural townships consistently have unemployment rates below 3%, while Stratford's is currently 5.8% (up from 4.8% at the last census). These rates are all considerably below the rates for Ontario and Canada as a whole. Virtually all of the large employers in the Analysis Area are located within the City of Stratford, and the urban area of Stratford is the centre of the tourism economy. However, there is also some 'urban shadow' effect in the eastern end of the Analysis Area, due to the proximity of Kitchener/Waterloo/Cambridge.

Manufacturing and tourism are the largest employers in Stratford. The City is also a centre for retail, personal services, and government services for the surrounding area. The Stratford Festival, a seven-month long series of theatrical productions, is the centrepiece of the tourism industry, hosting 600,000 visitors every year. The Festival itself employs 1,200 people, while many more jobs are supported by the needs of Festival patrons for accommodation, food, and drink.

Manufacturing of vehicle parts for the automotive and aerospace industries is also a substantial industry in Stratford. FAG bearings, Cooper-Standard (tires), and several other large employers are providers of automotive parts to plants in southern Ontario and across North America. Several of these large plants participate in "just-in-time" supply chain arrangements, making trucking access a key issue.

The majority of Perth East and Perth South residents are employed in the agriculture sector, including farm related businesses. Millwrighting, transportation, metal fabrication, water pump sales, distribution and repair, tourism, and home-based businesses also provide employment opportunities within these Townships. More than 400 jobs are provided by three transportation companies located in the Township of Perth East: Laidlaw, Luckhart, and Murphy's Bus Lines. A number of tourism-related businesses exist in the hamlet of Shakespeare, located on Highway 7 & 8 east of Stratford, including antique dealers and food service outlets. These establishments serve the passing traffic travelling to and from the Stratford Festival.

Some large employers have located in the 'urban shadow' area of the Township of Wilmot, specifically in Baden, New Hamburg, and the east portion of the rural area. A large transportation logistics firm, several manufacturing concerns, and a number of service and retail firms are located near Highway 7 & 8 within the Township.

6.3 Economic Conditions

Agriculture

While the settlements of Stratford and New Hamburg represent a concentration of commerce and industry, agriculture / farming is the major economic sector represented in the adjacent lands within the Study Area. The predominant agricultural operations in the region are dairy and beef, but the area also hosts substantial amounts of cash crops and mixed farming. The major field crops grown include mixed grain, corn, soybeans and hay and a variety of fruit and vegetables.

Soil classes 1, 2, 3 and 5 are represented within the Analysis Area. The majority of the soils fall into Class 1, which is defined as having no significant limitations for crops. Class 2 soils are well represented in the western end of the Analysis Area and are defined as having moderate limitations that restrict the range of crops or require moderate conservation practices. Class 3 soils are more evident in the eastern end of the Analysis Area. This soil type has moderately severe limitations that restrict the range of crops or require special conservation practices. The limiting factor in this soil type is an excess of water. There are some small isolated pockets of Class 5 soil in the mid eastern end of the Analysis Area. Class 5 soils have very severe limitations that restrict their capability in producing perennial forage crops, but improvement practices are feasible. The main limiting factors for this soil class is erosion and an excess of water. Organic soils also exist in the Analysis Area east of Stratford; straddling Highway 7 & 8, in an area know as Little Lakes.

Local Businesses

As part of the Study Design process, a survey of existing local businesses within the Analysis Area which 'front' onto Highway 7&8 or on to service roads or side roads adjacent to the highway was carried out in summer of 2004. A broader but less detailed survey was conducted within the City of Stratford to assess the urban economy of Stratford as a whole. For a detailed description of the existing business conditions in the Analysis Area, please refer to the Existing Business Assessment Report included in Appendix D of the Study Design Report, dated December 2005.

A total of 530 commercial establishments were surveyed in the Analysis Area, only twelve of which appeared to be unoccupied. This represents a relatively low rate of vacancy, which suggests a generally health economy in the Analysis Area. A total of 158 tourist retail and food, fuel, and accommodation establishments were identified along the corridor. These businesses could be considered to be the number of "highway-dependant" businesses within the study limits. Of these businesses, 146 have direct highway access, and the remaining 12 are accessed via a side road adjacent to the highway.

With regard to the types of businesses, which exist within the Analysis Area, New Hamburg hosts a concentration of industrial use buildings while Shakespeare has predominantly commercial use premises. Stratford contains several large and well-developed commercial areas, with industrial areas in the south, east and west of the City, along Highway 7&8. It is of note that closer to Stratford there appears to have been substantial business expansion over the last 10

years, with evidence of fairly recent commercial development. There has been far less commercial development or re-development over the same period in the smaller urban areas and in the rural areas within the Analysis Area.

6.4 Goods Movement

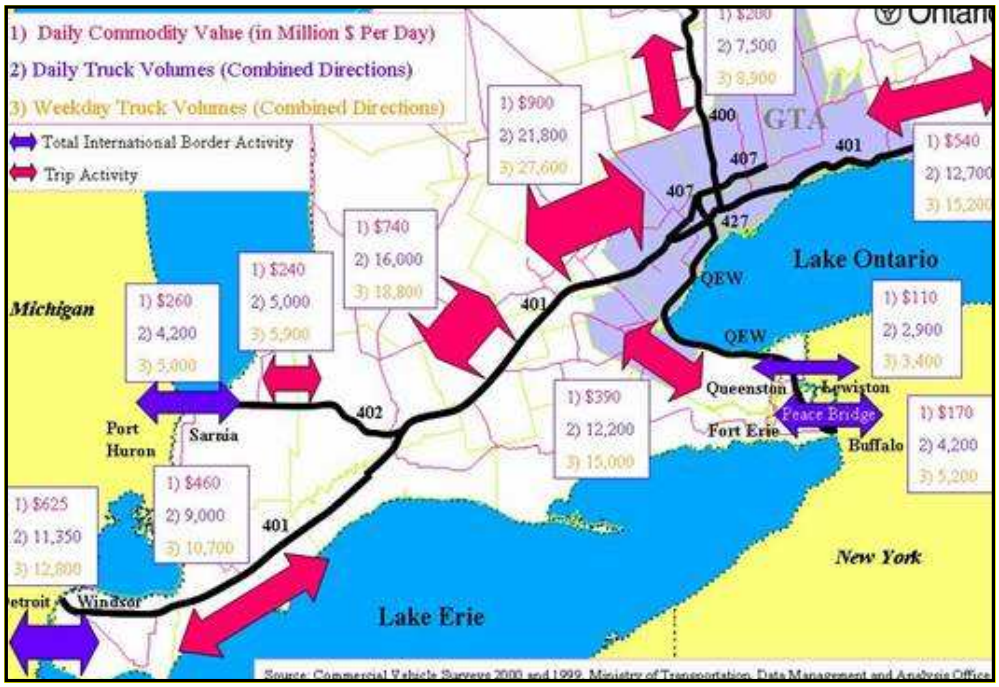
As noted in the 2004 iTrans Study Goods Movement Study, transportation of goods (by truck, rail, air, marine) is a critical element in the economic prosperity of a community/region. The efficient flow of goods is important to the decision making process and requires the complex interaction between variables such as wages, taxes, proximity to raw materials and markets, competitor actions and logistics systems. Southwest-Central Ontario is uniquely poised to play a significant role in terms of industrial growth and as a result, requires significant infrastructure to serve that economic flow.

Some key facts related to industrial activity/commercial flows in Southwest Ontario include:

- In 2004, roughly 93% of Ontario's exports by all modes worth $180 billion (52% of Canada's) were to the United States and 72% of Ontario's imports by all modes were from the United States.
- Ontario's exports to the US are centred on Canada's border states where 49% of trucks trips (5,800 trucks per day with $195 million in goods) carrying 43% of commodity values are destined. The next tier of states in the central U.S. represent 42% of the trucks carrying another 43% of the commodity value. Trips and commodities destined to more distant states such as California and Texas capture 9% of trips and 15% of commodity value.
- Each day, 3,100 trucks are destined to Michigan with $101 million worth of goods. Thus, 26% of all trucks and 22% of all road mode transported commodities by value are destined to Michigan.
- Employment increased by 770,000 jobs in Central Ontario (23%) from 1991 to 2001; more than three-quarters of that increase was in service producing industries.
- The Toronto Economic Region gained over 550,000 jobs, also driven by a boom in high-end service industries.
- Employment in motor vehicle industries in Central Ontario increased by more than 53%; parts manufacturing by 83%, compared to vehicle manufacturing by 16%.
- Plastics and rubber, fabricated metals, machinery, and to lesser extents, computers, furniture manufacturing, chemical and wood product industries all saw strong growth.
- Declining industries included primary metal manufacturing, electrical equipment, and paper manufacturing, as well as smaller manufacturing industries of clothing and leather products, textiles, non-metallic mineral products.
- Motor vehicles are by far the most valuable export to the United States from Central Ontario and accounted for 40% of all exports in 2001. These exports are valued at approximately $74.6 billion, and represent more than 95% of motor vehicle exports from Canada to the US.

Exhibit 6.1 provides a summary of commodity flows in Southwest and Central Ontario.

Exhibit 6.1: Daily Commercial Vehicle and Commodity Flows in Southwest-Central Ontario



The County of Perth, Greater Stratford and the Region of Waterloo are centrally located in this economic flow. With a significant economic flow to/from the U.S., both east and west of the Analysis Area, along with activity in the Urban Growth Centers of Kitchener and Waterloo, Highway 7&8 has emerged as a significant link in the provincial transportation network.

6.5 Summary of Analysis Area Socio-Economic Conditions and Outlooks

The population, employment and economic findings indicate that the Analysis Area is quite stable from a population and employment perspective given the low vacancy rate of businesses in the Analysis Area, and the low unemployment rate. In addition, the Analysis Area hosts a wide range of economic activities, including: manufacturing, commercial/industrial, tourism and agriculture. Given this diversity, the Analysis Area is considered to be quite sustainable, and as such, it is important that the Ministry plan for future improvements to Highway 7&8 to support this sustainability.

Socio-economic conditions and outlooks for the Analysis Area are summarized in **Exhibit 6.2**.

Exhibit 6.2: Summary of Analysis Area Socio-economic Conditions and Outlooks

- population in Southwestern Ontario grew from 1.6 to 2.8 million people between 1961 and 2001;
- employment in Southwestern Ontario almost doubled between 1961 and 2001 to over 1.1 million jobs;
- population and employment growth focused on major urban centres;
- growth has resulted in increased travel times and costs for commuting and other travel;
- reduced accessibility and increased travel time affect region's economic competitiveness;
- strong auto-based commuting patterns between Greater Stratford and the New Hamburg area expected to continue; and
- economic prosperity of Analysis Area would benefit from improved transportation connection between Greater Stratford and the New Hamburg area.

7.0 ANALYSIS AREA – MODAL OUTLOOKS

7.1 Southwestern Ontario

The analysis carried out for the Strategic Directions document for Southwestern Ontario identified several trends relating to commuter travel, goods movement, mode shares, trade and tourism.

- As in the rest of the province, the automobile (including vans and light trucks) is the dominant intercity travel mode in Southwestern Ontario, accounting for over 90% of passenger kilometres travelled. The remaining transportation modes (bus, rail, GO Transit, marine and air) account for 7.5% of passenger kilometres travelled.
- The primary modes used for the transportation of goods in and through the region, based on tonnes shipped, are truck (68%), rail (18%) and marine (15%). Mode usage varies with the particular commodity transported, the market served, the need for "just in time" service, and the industry distribution system. Market trends indicate that truck transport will continue playing a greater role in the future.
- Trucking is the primary means of moving goods in Southwestern Ontario. Since the highway system links industry and markets in Southern Ontario and the U.S., there is substantial international truck freight movement on freeways in the region. The accessibility provided by the provincial and municipal road network makes trucking very competitive with other modes, except in the case of certain bulk goods and long distance hauls to markets outside Ontario.
- The provincial and regional level highways play a key role in the movement of intercity passengers and goods, and by 2026 will carry over 75% of the total system traffic in vehicle kilometres.
- A reduced level of service is forecast for the entire system, with the provincial and regional level routes showing substantial increases in the vehicle kilometres operating at congested conditions.
- All major urban centres show improved commuter containment (i.e. live-work arrangements).

7.2 Analysis Area

The transportation market in the Analysis Area is divided into two principle segments: people transportation and freight transportation. People transportation refers to trips made by an individual or group of individuals for personal reasons (trips to work, school or shopping). Freight transportation is related to the movement of goods through the Analysis Area by truck, rail, marine or air.

7.2.1 People Transportation

Travel characteristics in the Analysis Area have been identified through past studies of travel patterns in the Highway 7&8 corridor. Notable characteristics are as follows:

- For weekday travel, 35% of the traffic on Highway 7&8 is local within the Analysis Area, 55% has one end of their trip in the Analysis Area and 10% can be classified as through trips (i.e. not destined for the Analysis Area);
- For Sunday travel, 25% of the traffic on Highway 7&8 is local within the Analysis Area, 50% has one end of their trip in the Analysis Area and 25% can be classified as through trips (i.e. not destined for the Analysis Area);
- The highest hourly volumes on Highway 7&8 occur during the commuter periods;
- The weekday daily volumes range from 9,800 vehicles per day (vicinity of Stratford) to 19,800 vehicles per day (New Hamburg area); and
- Travel in the corridor is almost entirely by auto (more than 90%), with the remainder being truck or recreational vehicle, as the corridor is not served by any significant transit.

7.2.2 Freight Transportation

The predominant mode for freight in and through the Analysis Area is by truck. Approximately 10-15% of the traffic volume moving through the Highway 7&8 corridor is commercial vehicle traffic. For the most part these trucks originate in the St. Marys and Stratford area and are destined for Kitchener, Cambridge, Guelph, Hamilton and the GTA.

7.3 Summary of Analysis Area Modal Outlooks

The modal outlooks for the Analysis Area are summarized in **Exhibit 7.1** below.

Exhibit 7.1: Summary of Analysis Area Modal Outlooks

- **Automobile:**
  - predominant mode of travel in Analysis Area; accounts for over 90% of passenger kilometres travelled
  - bus, rail, GO Transit, marine and air account for 7.5% of passenger kilometres travelled
- **Trucking:**
  - principle means of goods transport in Southwestern Ontario
  - market trends indicate future growth of truck transport
- **Rail:**
  - Goderich-Exeter rail line used by Goderich-Exeter Railways and Canadian National Railway runs parallel to Highway 7&8 to the south
  - Rail line used by Goderich-Exeter Railway and Canadian National Railway to supplement the transport of commercial goods by truck

Exhibit 7.1: Summary of Analysis Area Modal Outlooks

- The rail companies currently do not have any plans for significant future expansion to their facilities so it is unlikely that freight rail service could replace the truck as the primary means for commercial goods movement through the province.
- Passenger service along this line is provided by VIA Rail. Between Stratford and New Hamburg, there is one VIA station in the City of Stratford, where a total of three trains arrive per day.
- While the VIA service is utilized to some extent by tourists traveling to the Stratford festival, it is unlikely that the utilization of this service could be sufficiently increased to avoid the need for roadway improvements

- **Transit:**
  - Limited public and inter-city transit
  - Only inter-city bus service provider is Greyhound Bus Lines which has only one bus terminal in the study area (located in downtown Stratford)
  - Municipal public transit is only available within the City of Stratford and offers a limited number of routes through the outer residential areas in the greater Stratford area
  - The province has recently announced that GO Transit bus service will be expanded to the Kitchener-Waterloo area and while transit expansion may lead to increased capacity of transit networks, it is not anticipated that capacity of the overall transportation network in the Highway 7&8 corridor will be sufficiently increased to eliminated the need for roadway improvements
- **Air:**
  - Limited by the market it serves and its usage within the Analysis Area
- **Marine:**
  - Limited by the market it serves and its usage within the Analysis Area

8.0 GENERAL DESCRIPTION OF CURRENT HIGHWAY 7&8 CONDITIONS

In 2002, the Ministry of Transportation completed a Corridor Assessment Study for the section of Highway 7&8 from the Stratford east limits to approximately 0.8 km east of Waterloo Road 5. The study identified existing operational problems, physical deficiencies, municipal issues and environmentally sensitive areas and provided a recommended action plan for the corridor. The results of the Corridor Assessment Study are documented in the Corridor Assessment Study Report, dated December 2002, which is available under separate cover.

The Study Design assignment undertaken by URS Canada Inc. included an update to the Existing Conditions section of the Corridor Assessment Study. The results of this update are documented in the Existing Conditions Update Report, dated March 2005, available under separate cover.

This section provides a general description of the current Highway 7&8 corridor, based on a review of background information, information from MTO operations staff and information from preliminary field reconnaissance. Infrastructure condition, performance, compliance with current design standards, suitability for service to increased traffic, and feasibility of implementing improvements versus replacement/major reconstruction (as applicable) are addressed for the major roadway components, including roadway geometry, structures, drainage, pavement, electrical system, roadside safety measures and utilities.

For a description of current travel characteristics and patterns on existing Highway 7&8, refer to Section 5 of this report.

8.1 Roadway Geometry

Highway 7&8 through the built-up area of Stratford is classified as an Urban Arterial Undivided (UAU) facility. The posted speed is typically 60 km/h, with a corresponding design speed of 80 km/h. Outside of the built-up area (i.e. extending from the east limits of Stratford to 0.5 km west of Waterloo Road 1), Highway 7&8 is classified as a Class 3 – Special Controlled Access highway. The functional classification is a Rural Arterial Undivided (RAU) facility with a posted speed limit of 80 km/h. In accordance with Ministry guidelines and practice, the specified design speed is 100 km/h, corresponding to 20 km/h higher than the posted speed limit.

The section of Highway 7&8 extending form 0.5 km west of Waterloo Road 5 to approximately 0.8 km east of Waterloo Road 5 is classified as a Class 2 – Staged Expressway/Freeway controlled access highway. The functional classification is also a Rural Arterial Undivided (RAU) highway, however, opposing directions of traffic are separated by a 1.0 m wide flush median.

A review of the existing Highway 7&8 geometry within the study corridor was undertaken, as documented in the Corridor Assessment Study Report, dated December 2002, and the Existing Conditions Update Report, dated March 2005. In addition, the Ministry's Engineering and Title

Record plates were reviewed and a field review was conducted in May 2007. The following roadway elements were reviewed:

- horizontal alignment;
- vertical alignment;
- cross section;
- interchanges / intersections; and
- access management.

These existing characteristics were compared to the suggested parameters set out in the Geometric Design Standards for Ontario Highways to determine the elements that do not comply with current geometric design requirements.

8.1.1 Horizontal Alignment

The highway, within the study area, is built primarily on tangent with generally flat to lightly rolling terrain. However, there are several locations, particularly in the four lane divided section (Waterloo Rd. 1 to 0.8 km east of Waterloo Rd. 5) where the horizontal alignment has some large radius circular curves.

The design standard for all horizontal curves located within the study corridor should reflect the minimum design parameters for the applicable design speeds of 80 km/h and 100 km/h as summarized in **Exhibit 8.1**. For deflection angles up to 0°30', horizontal curves are not required as specified in the Geometric Design Standards for Ontario Highways (GDSOH).

Exhibit 8.1 – Horizontal Alignment Design Standards for Provincial Highways

Design Speed (km/h)	Minimum Horizontal Radius (m)	Radius for which Spiral Required [1]	Minimum Spiral Parameter	Stopping Sight Distance (m)
100	420	R $\leq$ 2000 m	A – 190	185
80	250	R $\leq$ 1400 m	A – 130	135

Note: 1. For radii greater than the specified radii, the provision of spirals for horizontal curves is desirable but may be omitted.

With regards to minimum curve length, the Geometric Design Standards for Ontario Highways provides general guidelines which apply to rural roads. For curves with deflection angles between 0°30' and 1°, the curve length should be a minimum of 350 m. For curves with deflection angles between 1° and 5°, the minimum curve length is given by the expression L = 400 – 50 x deflection angle. For curves with deflection angles above 5°, the minimum curve length should be 150 m.

Between the east limit of Stratford and the New Hamburg area, there are 8 horizontal curves, ranging in radius from R-420 m to R-5239 m. One of the horizontal curves, located at Station

25+968, is a simple curve without spirals. All 8 horizontal curves meet or exceed the requirements for a design speed of 100 km/h. The intersection at Waterloo Road 3 is located on a horizontal curve with a radius of 873 m. The geometric design standards indicate that it is desirable for horizontal curves that are located at intersecting sideroads have a radius of 1200 m. However the existing 873 m radius exceeds the minimum allowable of 420 m for intersecting side roads.

The standard maximum superelevation rate for this type of roadway is 6.0% for a radius of 420 metres (100 km/h design speed). All of the 8 horizontal curves are within the range of superelevation rate based on a 100 km/h design speed and their radius of curve. The curve at Sta. 16+844 has normal crown due to the large radius.

One horizontal deflection point does not meet the minimum tolerated angle of 30 minutes as specified in clause C 3-4.2 of the GDSOH. The deficient deflection angle of 53'17" is located at Station10+686. It is recommended that improvements to the Highway 7 & 8 horizontal alignment in the area of this deflection point be considered during later design stages.

Horizontal sight distances along this corridor are generally good. The horizontal curvature of Highway 7&8 permit sufficient lateral clearances.

8.1.2 Vertical Alignment

The vertical alignment of Highway 7&8 within the study limits generally meets the design speed of 100 km/h. The vertical alignment is mainly flat at the most westerly end of the study limits and becomes slightly rolling in the easterly direction beyond Shakespeare. As the terrain becomes more rolling the visibility is reduced as there are several small vertical curves close together.

The design standard for all vertical curves located within the study corridor should reflect the minimum design parameters for the applicable design speeds as summarized in **Exhibit 8.2**. Vertical deflections are considered to be in accordance with design standards only when the deflection is less than 0.3%. The desirable minimum grade for curbed or uncurbed highways is 0.5% to promote drainage, with an absolute minimum grade (for uncurbed highways with adequate crossfall) of 0%, as identified in the Geometric Design Standards for Ontario Highways. The maximum desirable grade for this classification of highway is 8%.

Exhibit 8.2 – Vertical Alignment Design Standards for Provincial Highways

Design Speed (km/h)	Minimum K - Value Crest	Minimum K – Value Sag	Desirable Minimum Length of Vertical Curve	Stopping Sight Distance (m)
100	70	45 (headlight criterion) 25 (comfort criterion)	100	185
80	35	30 (headlight criterion) 15 (comfort criterion)	80	135

Note: K-value is a measure of vertical curvature (crest or sag) of a roadway that determines both sight distance available and design comfort for various operating speeds.

Sight distance is directly related to the gradient of the roadway and the adjustments to the gradient that are achieved through the introduction of vertical curves. The minimum parameters for vertical curves are based on comfort and safety.

The existing conditions update identified 48 vertical curves within the study limits and all were assessed as per the requirements of C4-6, 7 of the GDSOH. Of the 48 vertical curves, 36 meet the requirements for a 100 km/h design speed. The maximum grade for this type of facility is 6.0%. Within the study limits, the maximum grade encountered along Highway 7 & 8 was 3.7%. This grade was found at two locations, between Sta. 13+250 to Sta. 13+700 and between Sta. 25+000 to Sta. 25+250.

There are 22 "sag" vertical curves identified. Four of the identified vertical curves were situated along an illuminated section of the highway and did not meet the requirements for a design speed of 100 km/h based. The headlight criterion was applied to all "sag" curves with the exception of one that was situated along an illuminated segment of the highway.

There are 25 “crest” vertical curves identified. Six of these “crest” curves were deemed not desirable for a design speed of 100 km/h.

The vertical curvature along this corridor is also generally good, however stopping sight distances for a design speed of 100 km/h are not available at the vertical crest curves located at Sta. 16+624 and Sta. 19+147. The existing design speeds for both of these curves are 90 km/h and 75 km/h respectively. The curve located at Sta. 19+147 is located at the speed zone change from a posted 80 km/h to 60 km/h near the easterly limit of Shakespeare. Both of these curves should be considered for upgrading to a 100 km/h design speed, particularly the curve at Sta. 19+147 as many vehicles traveling in a westbound direction are still decelerating at this point.

Due to the rolling terrain along the 2-lane section of Highway 7&8, the sight distances are less than that on a flat, tangent section of highway and therefore the Passing Opportunities (PO) are reduced. When factoring in the opposing traffic volumes, the PO is reduced further. At times when sight distances are available the opposing volumes will not permit passing, this is referred to as the Assured Passing Opportunities (APO). The two lane section of Highway 7&8 currently has a low APO which is negatively affecting the Level of Service.

There are several deflection points along the Highway 7&8 vertical alignment that are not transitioned with vertical curves. These deflection points should be investigated further during later design stages and as more detailed survey information becomes available.

In summary, a number of vertical curves do not meet the minimum standards for the applicable design speed with respect to curvature (i.e. K-value), curve length and/or available sight distance. In addition, several areas of flat grade (0.5% or less) have been identified.

Opportunities to upgrade the existing vertical alignment of Highway 7&8 to current design standards will be problematic in several locations due to the developed roadside environment and the numerous intersections and entrances situated throughout the study corridor.

8.1.3 Cross-section

Highway 7&8 has three distinct cross-sections within the study limits.

The section of Highway 7&8 extending from the Stratford east limits easterly 2.9 km has a four-lane cross-section, consisting of 4 x 3.75 m lanes with 3.0 m granular shoulders including 0.5 m partially paved. A continuous left turn lane has been added as an extension to the existing along the connecting link within the City limits and is approximately 400 m long.

Some curb and gutter exists along the lower end of the superelevated section in the Little Lakes area. The curb and gutter provides erosion protection for the shoulder and embankment adjacent to the Little Lakes. Except for the existing curb and gutter locations, the drainage is conveyed by open ditches. The shoulder and lane widths are adequate for supporting a 100 km/h design speed.

From 2.9 km east of the Stratford City Limits to 0.4 km west of Waterloo Road 1, Highway 7&8 has a two-lane cross-section. The existing cross-section is primarily comprised of an undivided rural section with 2 x 3.75 m lanes and 3.0+ m granular shoulders including 0.5 m partially paved. With the exception of the hamlet of Shakespeare, drainage is conveyed by open ditches. Drainage within Shakespeare is conveyed by storm sewers.

Generally, the shoulder and lane widths are adequate for supporting a 100 km/h design speed with the exception of Shakespeare as noted below.

The existing shoulders have widened due to the accumulation of sand etc. from winter maintenance operations. As a result of the widened shoulders, the ditches have been filled and no longer drain properly.

Within Shakespeare, approximately 700 m is constructed as an urban section with mountable concrete curb and gutter and fully paved shoulders. Highway drainage in this location is via storm sewers. The area within Shakespeare is reduced speed zone (60 km/h). The through lanes vary between 3.75 m to 3.35 m. The existing lane widths at the intersection are marginally below the standard for a 80 km/h design speed (3.5 m).

The segment of Highway 7&8 from Waterloo Road 1 to 0.8 km east of Waterloo Road 5 has a four-lane cross-section. The shoulder and lane widths for this section of Highway 7&8 support a 100 km/h design speed. The existing cross-section configuration consists of 4 x 3.75 m through lanes with 3.0 m wide granular shoulders including 0.5 m partially paved and a 1.0 m wide flush median. Existing drainage is conveyed via open ditches.

There are no truck climbing or passing lanes within the study limits.

The average right-of-way width varies from approximately 36 m in the vicinity of Stratford to 91 m at the east end of the study limits from Waterloo Road 5 easterly. Through the central part of the study limits, from 2.9 km east of the Stratford east limits to Waterloo Road 1 to average right-to-way width typically ranges from 26 m to 30 m.

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The available road allowance along the existing corridor and the built environment towards the west end of the Analysis Area and in pockets throughout the study corridor present significant constraints to achieving identified capacity and safety improvements along the existing corridor and/or to providing a transitway facility.

8.1.4 Interchanges / Intersections

Outside of the built-up area of Stratford, the following 21 sideroad intersections are present, all of which are stop controlled on the sideroad with the exception of the Perth Road 107, Waterloo Road 4 West Junction and the Waterloo Road 4 East Junction intersections, which operate under signal control:

- Perth Road 111;
- Forest Road (West);
- Forest Road (East);
- Perth Road 110;
- Perth Road 109;
- Perth Road 108;
- Sackville Street;
- Regent Street;
- James Street;
- Princess Street;
- Perth Road 107;
- Byron Street;
- Perth Road 106;
- Perth Road 104;
- Perth Road 102;
- Waterloo Road 1 – Perth Road 101;
- Waterloo Road 3 (Walker Road);
- Waterloo Road 4 – West Junction (Peel Street – Haysville Road);

- Victoria Street;
- Waterloo Road 4 – East Junction (Hamilton Street – Bleams Road); and
- Waterloo Road 5 (Nafziger Road).

The intersection skew angles were reviewed. All but one intersection meet or exceed the minimum 70˚ or 110˚ skew for existing intersections. Waterloo Road 1 has an existing 64˚ skew angle. Any reconstructive work at this intersection should include realignment of Waterloo Road 1 to provide for a minimum 80˚ skew.

While the sight triangles at all intersections should be clear of any obstructions, vegetation or other objects are present in the sight triangles at a number of intersections. This vegetation will have to be cut back before it obstructs the view of motorists attempting to enter Highway 7&8 or block the view of sideroad traffic for vehicles traveling on Highway 7&8.

Through the built-up area of Stratford, numerous sideroad intersections are present. The majority of the intersections are signalized, with the remaining intersection stop-controlled on the sideroad approaches.

8.1.5 Access Management

Highway 7&8 is designated as a King's Highway under the *Public Transportation and Highway Improvement Act*. In addition, Highway 7&8 is classified as an arterial highway under MTO's Functional Classification System.

Access and mobility (role and function) are major considerations in determining the functional classification of a highway. The conflict between serving through movement and providing access to various trip origins and destinations necessitates the hierarchy of functional classification types.

As an arterial highway, Highway 7&8 is intended to move large volumes of through traffic at high speeds, and to serve as the major route connecting Stratford to the New Hamburg area. Because arterials carry large traffic volumes moving at high speed, direct access to abutting lands should be restricted or even eliminated. This applies particularly in areas of intensive development and in undeveloped areas where the lack of other highway services would encourage strip development.

The purpose of access management is to provide vehicular access to land development in a manner that protects and preserves the safety and efficiency of provincial highways for the movement of people and goods. Access management must also ensure that Highway 7&8 continues to operate in accordance with its intended role, function, mobility and design characteristics as an arterial highway.

For access management purposes, MTO's current access management policies and standards currently being applied to the Highway 7&8 corridor are more reflective of a collector highway versus an arterial highway.

Typically for an arterial highway, the following access management standards apply:

- desirable / minimum public road intersection spacing is 1600 m / 800 m
- desirable / minimum commercial entrance spacing is 1600 m / 800 m, measured from either an existing public road intersection or another commercial entrance, regardless of which side of the highway it is located
- access density is 4 residential / farmstead entrances per side per kilometre

Based on a cursory review of the existing access conditions, the intersection spacing is less than desirable in a number of locations. Furthermore, the current number of commercial access connections in several areas exceeds what an arterial highway should have in order to function safely and efficiently.

A detailed review of the intersection spacing and the access density for commercial, residential/farmstead entrances and field entrances is currently underway. The results of the review will be documented in the final version of Report B.

In generally, the number of intersections and numerous commercial, residential / farmstead and field entrances are an indicator that more stringent access management policies are required for Highway 7&8 to improve safety and efficiency and to ensure that the corridor operates in accordance with its intended role, function, mobility and design characteristics, as an arterial highway.

8.1.6 Summary of Roadway Geometry

In summary, if increased capacity is to be provided for the existing Highway 7&8 corridor, geometric and traffic safety characteristics on Highway 7&8 must be addressed. This is indicated in **Exhibit 8.3** below, in which ideal highway geometric conditions are compared to those for existing Highway 7&8.

Exhibit 8.3: Comparison of Ideal Highway Conditions to Highway 7&8

Ideal Conditions	Highway 7&8 Conditions
• Design features of roadway linked to legally posted speed	• Numerous vertical alignment features do not meet desirable limits for the posted speed
• Lane width equal to or greater than 3.75 m where posted speed limit is 80 km/h and 3.5 m where posted speed limit is 60 km/h	• Typically 3.75 m wide lanes except through Shakespeare where lane width is marginally below standard (3.35 m versus 3.5 m)
• Clear shoulders equal to or wider than 2.0 m for disabled vehicle refuge	• Typically 3.0 m wide granular shoulders including 0.5 m partially paved; fully paved shoulders for a short section within Shakespeare
• Full passing opportunities	• Limited passing opportunities due to horizontal alignment, vertical alignment and intersection spacing resulting in through vehicles spending a high proportion of time in platoons and operating at less than their desired speeds which adversely affects safety
• All passenger cars in traffic stream	• 10-16% commercial vehicles in corridor
• Directional distribution of 50/50	• 55% westbound / 45% eastbound
• Low number of intersections and entrances so that impediments to through traffic due to traffic control devices or turning traffic are minimized	• Numerous intersections and entrances within study area
• Level terrain	• Level to rolling terrain

8.2 Structures

There are three structures within the study limits. These include one major culvert crossing with a span of 5.5 m crossing the Wilmot Creek at Station 25+390, the Goderich-Exeter Railroad subway structure at Sta. 25+496 (Perth East) and the Nith River Bridge at Sta. 13+710 (Wilmot).

8.2.1 Wilmot Creek Culvert – Site No. 25-318

The culvert crossing the Wilmot Creek is an open footing concrete rigid frame structure with a 5.5 m span and 1.52 m height. The culvert is on a 75˚ skew angle, measuring clockwise from the centerline. There is approximately 1.15 m of freeboard from the obvert of the culvert to the centerline of the highway.

A site investigation (2002) revealed that this culvert is in poor condition and should be replaced.

8.2.2 Goderich-Exeter Railroad Subway – Site No. 25-266

The CNR railroad subway structure is currently leased to the Goderich-Exeter Railroad. This bridge is a steel girder bridge that carries one track over Highway 7&8. The vertical clearance measured at the centerline of the highway is 4.850 m. The existing skew angle, measured clockwise from the centerline, is approximately 155˚. The Geometric Design Standards require a minimum 5.0 m clearance for new girder type structures. Existing structures with a vertical clearance of less than 4.5 m must be signed. No geometric improvements on the highway are required to provide additional clearance.

This structure is approximately 104 m east of the Wilmot Creek structure (Site No. 25-318).

8.2.3 Nith River Bridge – Site No. 33-165-125

The Nith River bridge is a three span reinforced concrete continuous prestressed beam bridge with an overall approximate length of 64 m and is located approximately 50 m east of the Peel Street intersection (W. Jct. of Waterloo Road 4). This structure carries two eastbound lanes, two westbound lanes and the west-north ramp taper for right turning vehicles onto Peel Street. The width of this structure varies from 21.9 m to 27.6 m. There are no sidewalks on the bridge to provide for pedestrians. However, a pedestrian walk has been constructed under the structure on the east bank of the Nith River to allow for pedestrians to cross the highway safely. This structure was originally built in 1988 under contract 88-0012. The condition of the structure is good, however normal practices recommend rehabilitation every 15 to 20 years, therefore, there may be a need for rehabilitation.

8.3 Drainage

Drainage within the study limits is primarily by open ditch drainage system to various lowlands and watercourses. Storm sewers exist in Shakespeare within the urban cross section. The highway drainage flows east and west of Perth Road 107 and then in a southerly direction with outlets located at the Shakespeare Drainage Works to the east and the Shakespeare Award Drain to the west. Municipal drains, CSP and concrete culverts, and storm sewers also contribute to the overall drainage scheme within the study limits.

Generally the culverts within the study limits are in fairly good condition. Preliminary inspections have identified some necessary remedial improvements to many of the existing culverts, with the exception of 4 culverts that have been identified for replacement.

A site investigation conducted as part of the 2002 Corridor Assessment Study revealed that the culverts needing replacement are all located within the Township of Perth East at Sta. 14+633, Sta. 17+683, Sta. 25+385, and Sta. 26+195.

CSP entrance and sideroad culverts are also located throughout the corridor.

Watercourses/Municipal Drains

There are 23 significant watercourses located within the study limits. Most of the significant watercourse crossings are municipal drains with the exception of the Nith River.

Visual inspections conducted as part of the 2002 Corridor Assessment Study found most of the crossings to be in a reasonable state of repair however, some need for improvements were identified, including the need for several culvert replacements which have recently been completed.

8.4 Pavement

As part of the Corridor Assessment Study, the Ministry reviewed the condition of the existing Highway 7&8 pavement. The results of this review are documented below.

Stratford East Limits to 2.9 km east of Stratford

This section is located in the physiographic region of the Stratford Till Plain. The predominant soil types are the poorly drained silt loam and the better Huron Clay Loam.

This section of Highway 7&8 was recently rehabilitated under contract 2002-3306. The contract involved rehabilitation of the pavement for 2.9 km, fully paved shoulders, reshaping of the ditches and replacement of several entrance culverts. The previous resurfacing under contract 85-31 included widening to 4 lanes. Upon completion, the pavement performance and ride was reclassified as good and the new Pavement Condition Rating (PCR) is desirable.

2.9 km east of Stratford to Shakespeare (Perth Road 107)

This section is located in the physiographic region of the Stratford till Plain. The predominant soil types are silty clays.

This section of Highway 7&8 consists of underlying concrete base with an asphalt surface. Previously the pavement platform was widened from 6.1 m to 7.5 m. The widening consisted of an asphalt plug and overlay. In 1998, the surface was milled and paved with 50 mm of HL-1 excluding the urban section in Shakespeare. In 2000, an additional 50 mm overlay was placed. In 2001, a 50 mm overlay was placed throughout Shakespeare.

Perth Road 107, Shakespeare to Waterloo Road 1

This section is located in an undrumlinized till plain. The principal soil type is Huron clay loam.

This section was widened and rebuilt under contract 84-48. In 1998, the pavement was milled to a 50 mm depth and paved 7.0 m wide excluding the partially paved shoulders and the outer 0.25 m edge of each lane.

This section was last reviewed in 2001 and has a PCR of 73. The need for rehabilitation has been recognized and it is currently on the ministry's five-year capital construction plan.

Waterloo Road 1 to 0.8 km east of Waterloo Road 1

This section is located in the physiographic region of the Stratford till Plain. The predominant soil type is the Huron clay loam.

Under contract 88-12, this section of highway was widened to 4 lanes with a 1.0 m flush paved median.

This section was last reviewed in 2001 and has a PCR of 63 for the eastbound lanes and 62 for the westbound lanes. The need for rehabilitation has been recognized and it is currently on the ministry's five-year capital construction plan.

8.5 Electrical Systems

Traffic Control Signals

Traffic control signals exist at the following intersection along Highway 7&8 outside of the Stratford City limits:

- Highway 7&8 /Perth Road 107;
- Highway 7&8 /Waterloo Road 4 – West Junction; and
- Highway 7&8 /Waterloo Road 4 – East Junction.

As part of the Corridor Assessment Study, the Ministry's Regional Traffic Section reviewed the intersections with Highway 7&8 and determined that traffic control signals are operating at all warranted locations except for the intersection at Waterloo Road 1. Currently the preliminary design study (W.P. 335-97-00) involves reviewing the benefits of installing the traffic control signals under the MTO's five-year construction program.

Additionally, further review of the intersections at Waterloo Road 3 (Walker Road), Victoria Street, and Waterloo Road 5 (Nafziger Road) was undertaken. Turning movement counts, collision data, and signage were reviewed and it was determined that traffic control signals are not warranted. However, the collision data has identified a justified warrant for an overhead flasher at Waterloo Road 5. This will be reviewed as part of this Planning and Class EA Study.

Illumination

Ministry illumination exists within the right-of-way at various locations throughout the study limits as follows.

- Full illumination exists at the following locations:
  - Throughout the community of Shakespeare from just east of Sackville Street easterly to Byron Street.

- Partial illumination exists at the following intersections:
  - Huron Road (Waterloo Regional Road 1)
  - Wilmot Sideroad 11A/Waterloo Regional Road 3
  - Peel Street / Haysville Road (west junction of Waterloo Regional Road 4)
  - Hamilton / Bleams Road (east junction of Waterloo Regional Road 4)
  - Waterloo Regional Road 5

There is no municipally operated illumination within the Highway 7&8 corridor.

8.6 Roadside Safety Infrastructure

Roadside safety infrastructure, consisting of steel beam guide rail, exists in several locations throughout the study corridor. Highway 7&8 corridor improvements would necessitate the detailed investigation of roadside protection barrier systems.

8.7 Utilities

Union Gas

Buried gas lines exist at various locations within the highway ROW throughout the study area. Most of the gas lines exist along the 2-lane and 4-lane section between Stratford and Waterloo Road 1. Within the section of Highway 7&8 holding the Class II staged freeway/expressway, in the New Hamburg area, Union Gas has a limited presence.

Rogers Cable

Rogers FOTS exists within the corridor between Stratford and Waterloo Road 1. This plant is both overhead and buried. Although there are no lines within the corridor between Waterloo Road 1 and Waterloo Road 51, there are various locations where it crosses the highway.

Kitchener-Wilmot Hydro

The presence of utilities along the Class II expressway/freeway corridor is limited. MTO policies discourage the issuance of encroachment permits for utilities on Highways with this classification. Kitchener-Wilmot Hydro do have overhead transmission lines crossing Highway 7&8 at various locations. There is also an overhead line that parallels the highway on the south side between Waterloo Road 5 and the former intersection at Waterloo Road 6.

9.0 SUMMARY OF KEY FACTORS DRIVING 'AREA TRANSPORTATION SYSTEM' NEEDS

9.1 Key Factors

A number of key factors that influence the 'Area Transportation System' needs have been identified through this preliminary assessment based on a field review, and review of available related documentation/reports. The majority of the identified issues will be addressed in subsequent Reports through Phase 1 and in subsequent phases (Phases 2 and 3) of the study.

The summary of key factors driving 'Area Transportation System' needs have been summarized into the following themes:

- Policy Framework;
- Socio-Economic Conditions;
- Modal Outlooks;
- Existing Transportation System Travel Characteristics; and
- Existing Highway Conditions.

Policy Framework

The policy developed by various levels of government is consistent with respect to the direction on land-use planning and transportation to promote strong communities, a clean and healthy environment, and a strong economy. The policies recognize the complex inter-relationships among economic, environmental and social factors in planning.

From a provincial perspective, a new transportation corridor would have to function within the provincial transportation network, and connect to existing provincial facilities at locations that are compatible with existing infrastructure or future plans. Better use of land and infrastructure can be made by directing growth to the existing urban areas. The provincial policy including the Greenbelt Plan and Places to Grow envisages increasing intensification of the existing built-up areas, with a focus on urban growth centres, intensification corridors, major transit stations areas, brownfield sites and greyfields. Concentrating intensification in these areas provides a focus for transit and infrastructure investment to support growth.

From a local perspective, Cambridge, regional and municipal staff and politicians are concerned with how and where a future transportation corridor enters and services their respective municipalities, and the compatibility of the future corridor with their land use strategies and plans for future development.

Socio-Economic Conditions

The socio-economic conditions in the Analysis Area can be described as undergoing significant change. Over the period from 1961 to 2001, Southwestern Ontario grew from 1.6 million to 2.8

million people. The region's population is projected to grow at a rate similar to the rest of Ontario, to 4 million by 2026. Southwestern Ontario employment almost doubled between 1961 and 2001 to over 1.1 million jobs. Total employment is projected to grow to almost 1.9 million by 2026.

Population and employment growth is focused on major urban centres in the area beyond the GTA along Highways 400, 401, and 403. Modest growth is projected for the Region of Waterloo, the counties of Simcoe and Middlesex, and in the urban areas of Kitchener-Waterloo, London, Barrie, Cambridge and Guelph. Population and employment forecasts indicate that the Region of Waterloo will continue to grow on average 2% per year over the next 30 years.

One expected outcome of this growth will be increased travel times and costs for commuting and other travel due to increasing travel distances and congestion within the Analysis Area. Reduced accessibility and increased travel time will affect this region's economic competitiveness as goods movement and employee commuting times increase due to highway congestion.

Even as urban centres evolve and new growth management policies for more compact forms of development and alternative forms of transportation are provided between the major centres, the strong auto-based commuting patterns between Stratford and the New Hamburg area are expected to continue. Accordingly, the continued success of the Analysis Area from a socio-economic perspective would benefit from an improved transportation corridor between Stratford and the New Hamburg area.

Modal Outlooks

The Regional transportation system in and around the Highway 7&8 Corridor comprises automobile/truck modes, pedestrian/cycling modes, and rail, bus, and air to meet inter-city passenger needs. Major freight transportation modes include truck and rail.

Automobiles

Automobile traffic using the provincial highway system is by far the predominant mode of travel, accounting for more than 90% of the passenger kilometers travelled. The remaining transportation modes (bus, rail, air, cycling, and walking) account for 7.5% of the passenger kilometres travelled. The automobile continues to be the preferred mode of travel in Southern Ontario. Auto ownership rates have been growing faster than the population growth rate over the previous decades with the popularity of suburban life being a major contributor.

Trucking

Trucking is the principal means of goods transport in Southern Ontario with highways linking to all major manufacturing centres and international border crossings. The trucking industry is expected to maintain its existing share of the transportation market for short and medium haul shipping, even as rail attempts to expand its long haul share into the short/medium market.

Industrial and commercial development will also continue to require timely access to customers and suppliers located within and external to the Analysis Area. An improved east-west highway between the urban centres is required in order to serve this need.

Railways

The Goderich-Exeter Railway corridor runs parallel to Highway 7&8 from Stratford easterly to Kitchener. The railway is generally located 400 m south of Highway 7&8 from Stratford to approximately 1.5 km west of the intersection with Waterloo Regional Road 1 where the railway crosses the highway. This rail corridor then extends eastward paralleling Highway 7&8 to the north through New Hamburg.

This section of rail carries approximately 8 to 10 trains per day. The volume of rail traffic consists of both freight and passenger trains. The trains using this rail corridor are traveling from destinations to the west, from as far as Sarnia and Chicago, and from Toronto in the east. Via Rail and Amtrak use this track for their personal service.

Transit

Within the Study Area, both public and inter-city transit is limited. Currently, the only inter-city bus service provider in the area is Greyhound Bus Lines, which has only one bus terminal in the Study Area (located in downtown Stratford). Municipal public transit is only available within the City of Stratford, and offers a limited number of routes through the outer residential areas in the Greater Stratford area.

With regard to future transit improvements, the province has recently announced that GO Transit bus service will be expanded to the Kitchener-Waterloo area. While future transit expansion may lead to increased capacity of transit networks, it is not anticipated that the capacity of the overall transportation network in the vicinity of Highway 7&8 corridor will be sufficiently increased to eliminate the need for roadway improvements.

Enhancing the role of transit in the Highway 7&8 corridor would help to achieve the provincial and municipal policy objectives for sustainable transportation and environment.

Airports

The majority of local, national or international air travel is serviced from Toronto's Pearson Airport, approximately 90 minutes southeast. The Stratford Municipal Airport is operational year round servicing charters, flight training and business jet travel along with necessary maintenance services. The Waterloo Regional Airport provides limited international (Detroit) and charter passenger service via small commuter aircraft. It also accommodates cargo, business charter and flight training along with necessary service facilities.

Marine

Four major ports are also located within two hours trucking time: Goderich, Toronto, Port Stanley, and Hamilton. This transportation accessibility is one potential advantage for locating businesses with national or international markets in the Study Area.

Existing Transportation System Travel Characteristics

The travel pattern for Highway 7-8 from Stratford City Limits to Waterloo Road 1 is Commuter Tourist Recreation (CTR). From Waterloo Road 1 to Waterloo Road 4 – West Junction, Highway 7-8 has a Commuter Recreation (CR) travel pattern. The segment from Waterloo Road 4 – West Junction to 0.8 km east of Waterloo Road 5 has a Commuter (C) travel pattern. Within the study area, Highway 7-8 experiences a Summer Average Daily Traffic (SADT) greater than the Average Annual Daily Traffic (AADT). Historically, over the past five years, SADT has been approximately 10 to 30 percent greater than the AADT. Seasonal traffic volume variations on the highway are attributed to increases in recreational and tourist trips during the summer months.

The 2004 count data (AADT) provided in **Exhibit 9.1** shows that the highest traffic volumes on Highway 7&8 in the Analysis Area are occurring on the section between Waterloo Road 4 and Waterloo Road 5. The traffic volumes are high enough to support the need for additional capacity along the 2-lane section of Highway 7&8 or the diversion of traffic to another corridor (new or existing)

Exhibit 9.1: Highway 7&8 Mainline Existing Traffic Volumes (2004)

Highway 7&8	2004 Average Annual Daily Traffic (AADT)	2004 Design Hour Volume (DHV)
Stratford City Limits to 2.9 km East of Stratford City Limits	9,800	980
2.9 km East of Stratford City Limits to Perth Road 107	9,800	980
Perth Road 107 to Waterloo Road 1	10,600	1,060
Waterloo Road 1 to Waterloo Road 4 (West Junction)	13,800	1,380
Waterloo Road 4 (West Junction) to Waterloo Road 4 (East Junction)	19,800	1,980
Waterloo Road 4 (East Junction) to 0.8 km East of Waterloo Road 5	18,400	1,840

Traffic along this highway corridor is mostly uninterrupted free-flow (i.e. no stop or yield control for the Highway 7&8 approaches) except at the following intersections which are signalized:

- Highway 7&8 /Perth Road 107;

- Highway 7&8 /Waterloo Road 4 – West Junction; and
- Highway 7&8 /Waterloo Road 4 – East Junction.

Under existing conditions, most of the key intersections along Highway 7&8 are operating within acceptable levels of service during the a.m. and p.m. peak hours.

There are some exceptions at the unsignalized intersections where there are high turning volumes to / from the side street. These include Perth Road 111, Waterloo Road 1, and Waterloo Road 5. In all these cases the critical movements are for the northbound and / or southbound approaches. Thus, eastbound and westbound approaches are operating well; however, notable delays and / or high v/c ratios are experienced on the side streets. There are limited opportunities to improve these conditions, all of which must be cognizant of the minimal side street approach volumes.

The operations at the signalized intersections (Perth Road 107, and West and East Junctions of Waterloo Regional Road 4) revealed LOS 'D' or better, with the exception of the Perth Road 107 intersection during the p.m. peak hour, which was found to be operating at LOS 'F'. It is noted that optimization of the signal timing at these locations resulted in improved intersection operations with no critical movements.

Commercial vehicle data provided by MTO indicates that Highway 7&8 through the Analysis Area is a major through trucking route, with trucks representing approximately 10% to 16% of the total traffic. Concerns have been raised regarding speed of trucks, volume of trucks, traffic safety and excessive noise.

Existing Highway Conditions

Highway 7&8 assumes three distinct cross-sections between Stratford and New Hamburg on the basis of the number of eastbound and westbound lanes that are provided, as well as the degree of separation that is provided between the eastbound and westbound lanes.

At the west end of the study limits, Highway 7&8 is a four-lane rural arterial roadway from the east limits of the City of Stratford to 2.9 kilometres easterly. This segment of Highway 7&8 is referred to as being 'undivided', as there is no separation provided between the eastbound and westbound lanes of the highway. Through the City (in a westerly direction) the highway separates into Highway 8 continuing in a northwesterly direction, and Highway 7 continuing in a southwesterly direction.

From 2.9 kilometres east of the Stratford east city limits to Waterloo Regional Road 1, Highway 7&8 is an undivided two-lane rural arterial roadway. The 700 m long section of Highway 7&8 through Shakespeare was constructed with a two lane urban cross-section and features a reduced posted speed of 50 km/h. (The posted speed for all other sections of Highway 7&8 within the corridor is 80 km/h). There is also a signalized intersection at Shakespeare's main street, Perth Road 107.

From Waterloo Regional Road 1 to the east limits of New Hamburg, Highway 7&8 is a four-lane rural arterial roadway. This section of the highway is referred to as being 'divided', as there is a

1 m flush median separating eastbound and westbound lanes. There are signalized intersections at Hamilton Road / Bleams Road (east junction of Waterloo Regional Road 4) and Peel Street / Haysville Road (west junction of Waterloo Regional Road 4).

East of the Study Area, Highway 7&8 continues as the major link between Stratford and the Kitchener / Waterloo / Cambridge area. Throughout this segment, Highway 7&8 is a controlled access, four-lane, divided urban freeway from east of New Hamburg through to Kitchener and the Greater Toronto Area via Highway 8 and Highway 401.

The west section of Highway 7&8 in the vicinity of Stratford and the central section through Shakespeare pass through the built-up urbanized areas (primarily commercial land uses) with a significant number of access points and/or traffic signals. The remaining sections of Highway 7&8 are generally rural. The numerous intersections and entrances throughout the highway corridor are an indicator that more stringent access management policies would be necessary to improve/maintain the level of capacity along the corridor. For a highway to effectively move people and goods there should be no or limited impediments to through traffic due to traffic control devices or turning traffic.

The applicable design speed for Highway 7&8 is 100 km/h (i.e. 20 km/h higher than the posted speed limit) except through the built-up areas where a reduced design speed applies given the lower posted speed limit. Several horizontal alignment elements and numerous vertical alignment elements do not meet requirements for the applicable 100 km/h design speed.

Limited passing opportunities exists due to the horizontal alignment, vertical alignment and intersection spacing resulting in through vehicles spending a high proportion of time in platoons and operating at less than their desired speeds.

Numerous safety related concerns have been expressed by the public and stakeholders in previous studies. Concerns relate to alignment deficiencies, accessibility, vehicle speeds, volume of trucks, signage, and general congestion.

The available road allowance along the existing corridor and the built environment towards the west end of the Analysis Area and in pockets throughout the study corridor may be a significant constraint to achieving acceptable capacity and safety improvements along the existing corridor and/or to providing a transitway facility.

10.0 PROCESS TO VERIFY AND DEFINE 'AREA TRANSPORTATION SYSTEM' PROBLEMS AND OPPORTUNITIES

The review of the transportation system and the identification of the problems and opportunities builds on a review of the federal and provincial policy framework and a series of related goals and objectives.

Goal: Optimize the use of existing and new infrastructure

- Optimize use of existing roads and transit (using roads and rail) through the appropriate use of transportation demand management (TDM) measures to reduce the need for new infrastructure while maintaining an acceptable level of service and supporting intensification areas;
- Ensure connectivity for moving people and goods;
- Provide for a peak hour level of service that is approaching capacity (Level of Service D) in the horizon year; and
- Facilitate achievement of long term transit (auto trip reduction) objectives/targets.

Goal: Provide sustainable transportation choices

- Support opportunities for multi-modal use where feasible, with priority given to transit and goods movement over single occupant vehicles;
- Provide opportunities for development of a multi-modal mobility plan;
- The transportation system should be planned and managed to support connectivity between modes for moving people and goods;
- Support the use of the private automobile for trips that cannot be readily made by other modes;
- Facilitate shift of goods movement from road to rail and other modes where practical; and
- Consider needs for goods movement in transportation corridors.

Goal: Safe and efficient movement of people and goods

- Provide improved transit service to encourage its use for increased efficiency;
- Transit infrastructure should be used to shape growth;
- Consider the separation of modes in corridors, where applicable;
- Encourage greater system efficiency and effectiveness by facilitating the use of the most appropriate mode of transportation for trip making;
- Explicitly consider safety in the design of new infrastructure; and

- Ensure that corridors are identified and protected to meet current and projected needs by all modes including summer recreational travel demands.

Goal: Ensure the development of infrastructure that links the Analysis Area and provides connectivity between economic nodes and centres within the Analysis Area and the Province

- Ensure system connectivity for moving people and goods;
- For goods movement, give priority to links that connect inter-modal facilities and connect to economic centres;
- Provide improved linkages for all modes between communities and regions that will foster improved system and modal efficiency;
- Provide for the most efficient movement of goods between centres through an integrated network at a local, regional and provincial level; and
- Provide internal linkages within communities that support development of improved cycling and walking trails/facilities.

Goal: To support and promote sustainable economic growth at federal, provincial and municipal levels

- Provide an acceptable level of service on the transportation network (including transit services) to support existing businesses and attract new businesses and employment opportunities;
- Direct growth to built-up areas where capacity exists;
- Provide a mix of land use choices and promote transit supportive densities;
- Create an integrated transportation system;
- Maximize "accessibility" and optimize economic linkages within the GGH through co-ordination of land use and transportation planning;
- Recognize the importance of tourism to the economy and facilitate growth of this market sector;
- Use terms of initiatives to direct growth;
- Support policies of jurisdictions within the Analysis Area and planned growth; and
- Support Provincial growth management principles.

Goal: Support the urban form and intensification strategies embodied in the Growth Plan

- Encourage development of urban growth centres as contemplated in the Provincial Growth Plan;
- Facilitate the development of transit supportive-development corridors;
- Support opportunities for development of a multi-modal system;

- Use public transit to assist in directing and shaping growth;
- Provide linkages between intensification areas for exclusive bicycle and pedestrian use;
- Co-ordinate transportation system planning with transportation investment and land use planning; and
- Support increased live-work ratios.

Goal: To create multi-modal transportation strategy that promotes the protection, conservation, enhancement and the wise use of natural resources

- Ensure compatibility of transportation improvements with existing/planned urban areas set out in the Official Plans of the jurisdictions within the Analysis Area and the Provincial Growth Plan;
- Encourage residential and employment intensification;
- Discourage development along transportation corridors in rural areas;
- Encourage development of improved vehicle technologies for autos, commercial and transit vehicles; and
- Encourage sustainability by promoting the most appropriate travel mode for trip making that minimizes economic costs and environmental and cultural impacts.

10.1 Assessment of the 'Area Transportation System'

To address the goals, the Area Transportation System will be reviewed in the context of existing and future performance based on planned changes to the socio-economic and transportation environments. Travel demand forecasts will be prepared for the Analysis Area in consideration of the potential future environment using computer based planning tools.

A strategic assessment of the corridor and facility performance will be performed by assessing the demand versus the provided capacity (volume to capacity). The assessment will be made at critical screenline locations through the Analysis Area to identify any capacity deficiencies. The traffic forecasting and travel demand analysis will be structured to provide sufficient detail to define the future need for major transportation corridor improvements within the Analysis Area.

The travel demand analysis will include the following activities components:

- Review of existing data bases (TTS, Census, Statistics Canada, Commercial Vehicle Studies, Provincial and regional traffic characteristics from existing Origin-Destination Surveys) and previous transportation reports to describe the existing travel characteristics between Greater Stratford and the New Hamburg Area.

- Application of a **Strategic Demand Model** that allows for the development of an analysis tool to forecast longer-term (2021 and 2031) travel demand in the Greater

Stratford to New Hamburg area corridor by specific user (commuter, tourist and commercial vehicle). The strategic demand model will reflect the larger Analysis Area.

The strategic demand model will quantify the magnitude of the travel demand and resulting network deficiencies for the base case future land use scenarios (Places to Grow and existing Official Plan policies).

- A **Detailed Demand Model** will be built from the trip tables developed as part of the Strategic Model and the transportation network being developed from available GIS and Area Transportation Models using EMME/2. This tool will allow for the assessment of various alternative networks including potential infrastructure outside the immediate corridor, as well as identify impacts on the existing provincial and regional road network.

- Forecast travel demands will be developed based on the fratar process. This process will use target trip end growth by trip type to grow the base year seed matrix. This process assumes that current trends in trip distribution are maintained over the long term.

- Traffic analysis will be undertaken for average peak hour and design hour volumes. The detailed model will be built to reflect the average weekday p.m. peak hour condition. Design Hour (DHV) and Design Day (AADT) will be derived using established relationships to the peak hour condition.

- The problems and opportunities will be categorized under four headings including transportation, economics, land use and the environment.

- All reasonable road improvement alternative solutions that could potentially address the problems and opportunities will be identified. The alternatives to be reviewed will include: do nothing, travel demand reduction, operational improvements, capacity improvements to existing infrastructure, and capacity improvements outside of existing infrastructure. The advantages and disadvantages of each alternative solution will be identified, assessed and evaluated to determine the alternatives that are feasible to address the identified problems and opportunities. Based on the alternatives identified, a Study Area will be defined that will be used in the Class Environmental Assessment process.

- The need for infrastructure improvement will be based on the cumulative analysis of role, function and operational performance of the roadway for existing and future conditions.

10.2 Conclusion

The assessment of the existing conditions provides sufficient information to move to the next stage of the Class Environmental Assessment. Specifically, it can be concluded that:

- Existing conditions in the Highway 7&8 corridor between Greater Stratford and the New Hamburg area exhibit signs of strain and periods of congestion;
- The corridor serves significant flows of people and goods through the Analysis Area;

- The Provincial Growth Plan designates one urban growth centre that is significant in terms of the role and function of Highway 7&8.
- Comprehensive network based strategies are required to address current and future mobility challenges. These strategies must recognize the interrelationship between all elements of the transportation system.

APPENDIX A

OVERVIEW OF SOUTHWESTERN ONTARIO STRATEGIC TRANSPORTATION DIRECTIONS

SOUTHWESTERN ONTARIO STRATEGIC TRANSPORTATION DIRECTIONS

MTO recognizes the importance of developing a vision for tomorrow's transportation system in concert with other levels of governments and developed the Strategic Transportation Directions documents for each of the MTO regions including Southwestern, Eastern, Northeast, Northwest, and Central.

The *Strategic Transportation Directions* (2002) documents set out a course of action for transportation in Ontario, taking into account the different needs of the various regions. These Strategic Transportation Directions are based on extensive research, and include relevant factors such as Smart Growth principles, infrastructure decisions and announcements, transportation studies conducted by MTO and other pertinent information. The *Strategic Transportation Directions* document, focusing on Southwestern Ontario:

- Provides an overview of the transportation network of the region;
- Examines the contribution of different transportation modes to the region's overall transportation system;
- Identifies social and economic factors in the region that affect transportation;
- Identifies growth patterns and their effect on future transportation needs;
- Identifies strategic directions for the development of the provincial transportation system; and
- Sets out strategies that MTO may pursue in relation to the region's overall transportation network.

A safe, efficient and integrated transportation system supports economic investment and promotes job creation. It contributes to the preservation of the environment and it makes and important contribution to the overall quality of life for everyone who calls Ontario home. The primary goal of the *Strategic Transportation Directions* process, therefore, is to develop a fiscally and environmentally sustainable transportation system that will foster economic development while addressing the needs of the transportation users, industry and the public.

MTO has identified a number of specific objectives under each of four key themes, which form the basis for the *Strategic Transportation Directions* approach:

Fiscal Management
- Maximize use of existing facilities;
- Consider innovative approaches to finance improvements to transportation systems and services; and
- Promote and support efficient and cost-effective transportation systems.

Economic Development
- Support provincial and regional economic development through the efficient movement of people and goods;
- Support the economic competitiveness of Ontario industry, including resource industries and tourism;

- Promote the integration of transportation systems; and
- Support the efficient operation of international and inter-provincial trade corridors and gateways.

Safety and User Needs
- Recognize the need for mobility through the development of an integrated transportation system that is safe, efficient and provides reasonable choice and accessibility;
- Ensure safety is an important element in all aspects of transportation; and
- Provide appropriate transportation choices to travellers.

Environmental Quality
- Promote Smart Growth principles related to land use; and
- Promote a balanced transportation system that reduces energy consumption and vehicle emissions.

These objectives are reflected in all Ministry of Transportation initiatives as part of the *Strategic Transportation Directions* process.

Population and Employment

Over the period from 1961 to 2001, Southwestern Ontario grew from 1.6 million to 2.8 million people. The region's population is projected to grow at a rate similar to the rest of Ontario, to four million by 2026.

Southwestern Ontario employment almost doubled between 1961 and 2001 to over 1.1 million jobs. Total employment is projected to grow to almost 1.9 million by 2026.

Population and employment growth is focused on major urban centres in the area beyond the GTA along Highways 400, 401, and 403. Significant growth is projected for the region of Waterloo, the counties of Simcoe and Middlesex, and in the urban areas of Kitchener-Waterloo, London, Barrie, Cambridge and Guelph.

Urban Centres

The population contained in urban areas – cities, towns and villages – represented almost 75% of the Southwestern Ontario population in 1996. People living in the region's 18 cities account for approximately 50% of the region's total urban population. All major cities, with populations in excess of 50,000 are close to provincial highways.

The region's major high growth centres include London, Kitchener-Waterloo, Cambridge, Guelph and Barrie.

The Kitchener-Waterloo-Guelph-Cambridge triangle has become a growth centre in the areas of computer-technology, engineering and telecommunications. Commutersheds around the City of London and the Kitchener-Waterloo-Cambridge-Guelph triangle are also becoming more congested as they evolve into major growth centres.