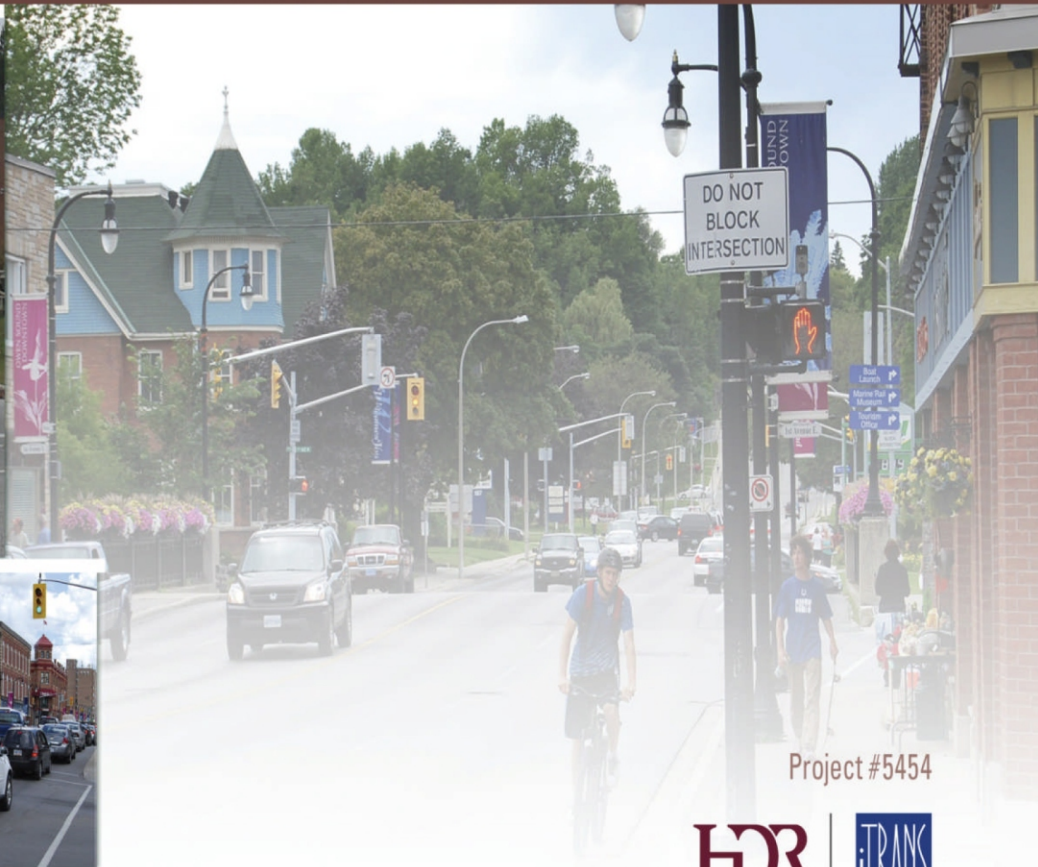


September 2010

City of Owen Sound



Transportation Master Plan



Project #5454



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EXECUTIVE SUMMARY

A. Introduction

The City of Owen Sound has embarked on the development of a multifaceted and comprehensive Transportation Master Plan known as “A Plan in Motion”. The growth in population within the City its outlying areas, increasing traffic congestion in some areas of the City, and changing demographics and societal values, contribute to support for more sustainable modes of travel.

Transportation related opportunities and challenges have reinforced the need to develop a comprehensive transportation plan to better manage existing and future transportation infrastructure and to ensure that Owen Sound maintain its position as the key regional centre in Grey and Bruce Counties.

This TMP is a practical guide for implementing transportation investments, policies, and actions to the year 2026 and beyond. The guiding principles from this document firstly ensure consistency and help to achieve the goals and objectives of other City policies such as the Official Plan and the Strategic Plan, and secondly provide for traceable recommendations to ensure that once they have been approved they can be implemented.

The Owen Sound Transportation Master Plan has been conducted in accordance with the master planning process outlined in the Municipal Class Environmental Assessment process (June 2000, Amended 2007) as approved by the Minister of the Environment.

The Transportation Master Plan builds on the approaches and ideas conveyed in the Sustainable Planning Guidelines report (developed by Transport Canada and the Transportation Association of Canada) adheres to the Municipal Class Environmental Assessment process. This multilayered process ensures that the appropriate transportation investments, policies, and actions can be verified, proposed, accepted, and implemented to support goals of sustainability, economic vitality, and healthy communities.

The TMP process incorporated, to various degrees, the 12 key principles identified by Transport Canada for sustainable transportation planning.

Key principles for Sustainable Transportation Planning	
Sustainable Communities & Transportation Systems <i>Principle 1:</i> Integration with land use planning <i>Principle 2:</i> Environmental health <i>Principle 3:</i> Economic and social objectives <i>Principle 4:</i> Modal sustainability <i>Principle 5:</i> Transportation demand management <i>Principle 6:</i> Transportation supply management	Sustainable & Effective Transportation Planning <i>Principle 7:</i> Strategic approach <i>Principle 8:</i> Implementation guidance <i>Principle 9:</i> Financial guidance <i>Principle 10:</i> Performance measurement <i>Principle 11:</i> Public involvement <i>Principle 12:</i> Plan maintenance



B. Public Consultation Process

The public consultation process was an essential component of the study. A public consultation program contained the following components:

- **Steering Committee Meetings** – These meetings provided for an exchange of ideas between the City and the Consultation team.
- **Visioning Workshop** – A Visioning Workshop was formed to allow citizens and individuals representing groups, agencies and organizations a special opportunity to provide input early on in the study and to provide feedback on preliminary alternatives. The Visioning Workshop is described in greater detail in **Section 2.2**.
- **Community Traffic Issues Meeting** – A meeting with the City of Owen Sound Operations Committee and citizens about community traffic issues in known “hot spots” was arranged to allow individuals to provide feedback about their concerns and suggestions how to mitigate the traffic issues in their community. The Community Traffic Issues Meeting is described in greater detail in **Section 2.2**.
- **Public Information Centre (PIC)** – One formal meeting was held during the Study, consisting of an open house format with display panels and a formal presentation followed by a discussion session. The PIC is described in greater detail in **Section 2.2**.
- **Newspaper Advertisements** – Advertisements were placed in the local newspaper to announce the Notice of Study Commencement, the Visioning Workshop, and the PIC. Notices were hand delivered to specific neighbourhoods to advise of the Community Issues Meeting. The newspaper advertisements invited the public to attend the meetings and to provide input. The advertisements provided information on contact names, telephone numbers, and addresses.

The input received from the public and stakeholders throughout the course of the study was very important with respect to the direction the study took, the alternatives that were assessed and carried forward, and the emphasis that was placed on various aspects of the transportation network.

C. Policy Context

To guide the Transportation Master Plan within the context of the overall direction provided by Provincial policy, Grey county policy and City of Owen Sound strategic policy direction was reviewed at the outset of the study. Key documents included the Provincial Policy Statement 2005, Grey County Official Plan, 2000, City of Owen Sound Strategic Plan 2008 and the City of Owen Sound Official Plan 2006.



D. Existing Transportation Network

Road Network

The main road network within the study area includes Provincial Highways, County of Grey Roads, and municipal Arterial and Collector Roads. The East-West road network is discontinuous due to the topographic nature of the land with limited connections up to either side of the Escarpment. As a result, the existing roads in Owen Sound that do ascend/descend the Escarpment experience capacity and congestion problems today. Congestion (especially on 10th Street) also leads to traffic spilling over onto residential collector roads, raising residents concerns over traffic infiltration, safety, and speeding in residential areas.

Transit Services

The City of Owen Sound operates both a Conventional Transit and a Specialized Transit service. The Conventional Transit service is a four (4) route system. All four routes provide half hour service from 6:30 AM to 6:00 PM Monday through Friday. On Saturdays, bus service operates between 9:00 AM and 5:30 PM. The Specialized Transit service provides a door-to-door transportation service for residents of the City with mobility limitations 5 days a week Monday to Friday from 8:00 AM. to 5:00 PM.

Pedestrian and Cycling Infrastructure

The City currently provides the following active transportation opportunities:

- Hard and soft surface trails and on-road connections,
- Sidewalks, typically adjacent to public roadways; and,
- On-road cycling permitted on local, collector and arterial roadways (but not marked as formal cycling routes).

There is currently a grid of pedestrian connections throughout the urban portion of the City. Sidewalks are provided on most County roads, arterial roads and collector roads on one or both sides of the road. The trail system also provides pedestrian connections.

The City of Owen Sound has planned a network of walk and cycle trails providing connections with recreational activities. The City Park Trails Master Plan of City of Owen Sound Official Plan identifies the planned walking trail and cycling network.

There are a couple of “missing links” including a missing sidewalk link on 19th Street East from 7th Avenue East to 5th Avenue East, a missing link along 8th Street East (Grey Road 5) from 16th Avenue to the Railway Line, and 8th Avenue West from 16th Street West to 19th Street West. For cycling network, there are also several short distance “missing links” that would help provide network continuity and complete the proposed network.



E. Traffic Conditions

Travel Patterns

An origin-destination survey was conducted on Friday October 23, 2009 to determine the amount of provincial, regional, and local traffic with origins or destinations to Owen Sound versus the amount of through traffic on City and County Roads. The survey was conducted on key arterial routes for vehicles inbound to the City (with the exception of Grey Road 18).

The City of Owen Sound was the main destination travel on roadway approaches to the City. By analysing the destinations by individual station location, it is apparent that there are three main areas within the city that draw the most trips: the Downtown core; the 16th Street East commercial area; and the 8th Street East institutional area. However it was determined that there is a significant percentage of traffic that does travel through the City of Owen Sound without origin or destination within Owen Sound:

- 15% from the west
- 14% from the south
- 18% from the east

Existing Traffic Capacity

An assessment of existing and future traffic conditions was undertaken as part of the Transportation Master Plan. The two measures of effectiveness used for the analysis include link capacity (vehicles per lane/per hour) and intersection capacity (volume / capacity ratio). Both are reported using a level of service indicator.

The analysis has indicated that under typical day peak hour conditions, east-west arterials in the west and east sides of the city have sufficient residual capacity available. The east-west crossings of the Sydenham River also have spare capacity available during the PM peak hour even though 10th Street is congested in this section of the City which indicates that roadways such as 8th Street East/West and 9th Street East/West have the residual capacity. The north-south screenlines (Grey County Road 1 and 4th Avenue West in the Northwest, Grey County Road 15 and 9th Avenue East in the north east, and Grey County Road 5 and 9th Avenue East in the south) are showing that there is sufficient capacity available during the PM peak hour on all routes.

Overall, for the majority of the transportation network there is sufficient capacity available. The capacity deficiency along 10th Street can be rectified if motorists are encouraged to utilize other east-west routes parallel to 10th Street such as 9th Street and 8th Street.

The majority of key intersections (arterial to arterial or collector to arterial) operate with an overall level of service 'D' or better during the PM peak hour, which is acceptable. The signalized intersections along the arterial connecting links (i.e. the 10th Street corridor downtown, 9th Avenue East, and 16th Street East) operate with an overall level of service 'D' indicating that the congestion on these links is caused by the intersections.



Site Specific Operational Issues

An analyses of three key arterial road sections along three main corridors in the City of Owen Sound was undertaken to identify a number of improvements to the signal timing plans at each signalized intersection along each of the respective corridors to optimize the signal timing plans and facilitate the movement of through traffic by reducing the overall delay to motorists. The three corridors are: 10th Street between 3rd Avenue West and 4th Avenue East, 9th Avenue East between 6th Street East and 16th Street East, and 16th Street East from 9th Avenue East to 18th Street East.

The existing signal timing plans along the 10th Street corridor have a cycle length of 120 seconds and are coordinated. To improve traffic operations, the updated signal timing plans are recommended having a cycle length of 70 seconds for all peak periods.

For the 9th Avenue East corridor, the existing signal timing plans have a cycle length of 100 seconds and are coordinated. To improve existing conditions, updated AM peak hour signal timing plans have a cycle length of 70 seconds for the first three intersections and 80 seconds for the final intersection. During the PM peak hour, a cycle length of 90 seconds is recommended for the first three intersections and 80 seconds for the final intersection. During the mid-day peak hour, the second and third intersections are coordinated and a cycle length of 75 seconds, the first intersection 55 seconds and the last intersection 80 seconds.

The signalized intersections along the 16th Street East corridor have a cycle length of 100 seconds and are coordinated. The updated signal timing plans have a cycle length of 80 seconds for all peak periods and are coordinated to include adequate through bands in both directions during the AM, Mid-day, and PM peak hours.

Future Traffic Capacity

The 2026 horizon year represents the worst case scenario given that it assumes the full build-out of vacant residential, industrial and commercial lands. The assessment of travel conditions assumed that all planned or programmed road network improvements would be in place. The forecasting and network assessment methodology is based on the principal assumption that current travel trends will remain stable and continue in the future.

The analysis has indicated that under future PM peak hour conditions, traffic flows on east-west routes such as 10th Street, 9th Street, and 8th Street across the Sydenham River, 10th Street West and Alpha Street in the west end, and Superior Street, 8th Street East, 16th Street East, 20th Street East, and 26th Street East in the east end of the city have sufficient residual capacity available. The east-west crossings of the Sydenham River also have some reserve capacity available during the PM peak hour with the exception of 10th Street which is congested in the Downtown area of the City. The north-south screenlines (Grey County Road 1 and 4th Avenue West in the Northwest, Grey County Road 15 and 9th Avenue East in the



north east, and Grey County Road 5 and 9th Avenue East in the south) are showing sufficient capacity available during the 2026 PM peak hour.

The majority of key intersections (arterial to arterial or collector to arterial) operate with an overall level of service 'E' or worse during the future 2026 PM peak hour. The signalized intersections along the arterial connecting links (i.e. the 10th Street corridor downtown, 9th Avenue East, and 16th Street East) show that future intersection operations are the main cause of congestion on these corridors.

F. Problem Statement

Based on traffic forecasts and a detailed analysis of existing and future conditions, the key transportation challenges for Owen Sound are summarized below:

- Owen Sound functions as a regional centre for Grey and Bruce Counties, and is therefore affected by overall growth in the Region. The majority of traffic in the study area has origins and destinations to Owen Sound. This reliance on the Owen Sound transportation network will continue to increase as the City and adjacent municipalities in Grey and Bruce Counties experience modest growth.
- Approximately 15% to 25% of traffic (depending on the route and principal direction) in Owen Sound is through traffic originating and/or destined to other municipalities in the County and Province. As the general population in Ontario and abroad grows, and tourist and recreational pursuits continue to grow, through traffic will further increase pressures on the City road network.
- As with the arterial road network, the collector road network lacks mid-block, continuous east-west and north-south connections due to the natural environmental and cultural environment heritage of the area. This lack of connectivity puts pressures on the few through connections present in the City to facilitate longer distance travel. It also increases the propensity for traffic to find alternative routes on roadways that are not designed or intended to accommodate modest to heavy volumes of traffic.
- Transportation requirements are closely related to economic activity. In economic terms, however, transportation is a “diseconomy” factor, meaning that the increase in cost of the transport of goods and services is directly related to increases in the cost of purchasing goods and services, and is subsequently passed on the consumers. Increases in traffic congestion and delays will negatively affect the City’ economic well-being and competitiveness.

Considering all the above, the assessment of existing and future conditions concludes that the provision of additional intersection capacity at select intersections is required in addition to the need for additional capacity on 10th Street through the Downtown.

There also needs to be a greater emphasis or reliance on other modes of travel. Enhanced public transit, improved walking and cycling facilities, and transportation substitutes such as communication technologies, will be required to meet the accessibility and mobility needs of the City’s residents and businesses.



G. Identification and Evaluation of Alternatives

Alternative Solutions

The project team identified and evaluated three long-term, alternative transportation planning strategies, plus a Do-Nothing scenario. The transportation planning alternatives were evaluated for 2026 travel demands, against a set of Evaluation Criteria to gauge their ability to address the challenges identified in the Problem Statement.

Do Nothing – The “Do Nothing” scenario reflects the current condition of the roadway network carried over to the 2026 horizon year without any capacity improvements. Except for the 10th Street extension, there are no planned expansions or additions to the arterial road network or Provincial highway system.

Alternative 1 – Maximize Use of Existing Infrastructure - Alternative 1 does not propose any significant infrastructure improvements, rather the intent of this alternative is to maximize the use of existing infrastructure and direct through traffic from routes that have capacity deficiencies onto alternative routes that have significant reserve capacity. Through traffic that normally travels along the corridors of 10th Street and 16th Street East will be redistributed onto the alternate routes by use of either static or dynamic signage. The alternate routes include an outer alternate route and inner alternate routes.

Alternative 2 – Multi-Modal Network with Maximum Utility of Existing Infrastructure - Alternative 2 includes all measures in Alternative 1, plus improvements to the pedestrian, cycling and transit network. The improvements to the pedestrian, cycling and transit network are listed below:

- **Cycling Routes** - A cycle lane spine network is proposed where a north-south and east-west cycle lane network will be established to provide strong cycling connections from existing residential areas to key attractions/generators in the City such as the downtown core, the 16th Street East commercial area, and the east side industrial area.
- **Express Transit Routes and Park and Ride Lots** - Two express transit routes (East-West and North-South) are proposed to further enhance existing transit service and support proposed travel demand management options including potential Park and Ride lots situated at the west, east, and south ends of the City.

Alternative 3 – Multi-Modal Network with Roadway Expansion - Alternative 3 includes all measures as included in Alternatives 1 and 2, plus a new crossing of the Sydenham River and/or Harbour. There are two potential options for the location of a bridge/harbour crossing - at 11th Street West or 14th Street West.



Evaluation Methodology

The performance and impact of the Do-Nothing scenario and the three Transportation Planning Alternatives were evaluated using a consistent set of evaluation criteria. The criteria are consistent with the recommended practice for Municipal Class Environmental Assessment and incorporate the environmental constraints within the City of Owen Sound.

The six evaluation criteria are:

1. Supporting sustainable development,
2. Providing high level of service on multi-modal transportation network,
3. Socio-economic impact,
4. Impact on natural environment,
5. Public support; and,
6. Capital cost.

Evaluation of Alternatives

Table 7.4 shows the preference rating and the results of the evaluation of the planning alternatives. Alternative 2, Multi-Modal Network with Maximum Utility of Existing Infrastructure emerged as the “most preferred alternative” with the highest overall score when assessing all of the criteria.

Based on the evaluation of the alternatives, the recommended long-term transportation strategy for Owen Sound is Alternative 2 – Multi-Modal Network with Maximum Utility of Existing Infrastructure.

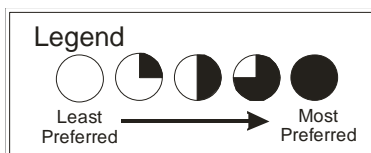
The key advantages of the preferred alternative are that it offers the best opportunity to:

- Address the issues at the root cause of the current and future transportation challenges,
- Satisfy County and City growth objectives,
- Encourage alternate travel trips (cycle and transit) while reducing auto trips,
- Minimize congestion and the cost of congestion,
- Support goods movement and access to employment areas; and,
- Support traveller visiting needs.



Table E.1: Evaluation of the Planning Alternatives

	Do Nothing	Alternative 1- Maximize Use of Existing Infrastructure	Alternative 2- Multi-Modal Network with Maximum Utility of Existing Infrastructure	Alternative 3- Multi-Modal Network with Roadway Expansion
Supporting sustainable development				
Providing a high level of service on a multi-modal transportation network				
Mitigating Socio-economic impact				
Mitigating the environment impacts				
Public support				
Capital cost				
Overall				





H. Recommended Long-Term Transportation Strategy

The components of the recommended transportation strategy are listed below and described in the remainder of this section:

- Land Use and Development,
- Transit,
- Arterial Roads,
- Goods Movement,
- Walking and Cycling,
- Travel Demand Management; and,
- Traffic Calming.

Land Use and Development

Intensification of primary transit corridors and downtown areas has been shown in other jurisdictions to encourage higher transit usage, increased walking and cycling. In turn, it can reduce reliance on auto travel and relieve accompanying traffic pressures. Within the City of Owen Sound opportunities exist for encouraging walking, cycling and transit use through the development along 10th Street, 9th Avenue East and in the downtown core. It is recommended that development planning and design principles incorporate methods identified in the Transit-Supportive guidelines prepared by the Province of Ontario.

Road designs could be updated to accommodate cyclist and pedestrian needs. It is recommended that road design standards be updated to accommodate on-road bicycle lanes and cyclists within the boulevard, and include pedestrian-friendly treatments at intersections and along residential and industrial collector roads. It is recommended that development applications be reviewed to identify requirements of development applications that meet pedestrian and bicycle needs consistent with this plan. Zoning requirements should be reviewed to consider the needs for cycling infrastructure such as required bicycle parking on site.

Transit

Recommendations for the Owen Sound Transit surface route network would be to undertake a detailed transit service network review which should include the provision of East-West and North-South Express services along the key corridors which connect the high attraction trips in the City. Accordingly, the recommendations are emphasized to support TDM based ride-sharing initiatives and discourage single-occupancy vehicle travel.



Arterial Roads

Recommended improvements to the County and City arterial road network should focus on improving on the available link and intersection capacity, rather than major new infrastructure investment. This includes further investigating and scheduling intersection improvements and directing traffic to corridors with reserve capacity.

This policy recommendation is critical in meeting City's objectives in providing adequate level of service for transit and maximizing transit modal split. In addition, this study recognizes that arterial roads and collector roads are multi-modal corridors that serve cars, transit vehicles, pedestrians, and cyclists. The key recommendations for the road network are summarized below.

- Promote the use of the outer alternate route around Owen Sound for through truck traffic using the County and Provincial highway network.
- Implement traffic control signal timing improvements on 10th Street
- Monitor traffic conditions and implement traffic control signals when warrants are met
- Initiate corridor studies on 10th Street and 16th Street to assess the functional feasibility of intersection improvements (as identified in Chapter 6) and develop a preliminary design with implementation coordinated through the capital program process

Goods Movement and Alternate Route Design

It is recognized that efficient goods movement is an important element of an economically viable region and that maintaining efficient goods movement is an objective of the City of Owen Sound. However, there is a need for a balance between efficient goods movement and maintaining a liveable community and meeting community traffic needs. The following are recommendations to improve the movement of goods and services in Owen Sound:

- Promote the use of the outer alternate routes (using Grey Roads 11 and 18) around Owen Sound for through truck traffic using the County and Provincial highway network.
- Work cooperatively with the County and province in review and design of roads used recommended as the alternate routes.
- Co-operate with the Province of Ontario and Grey County in implementing the use of traffic management tools such as Commercial Vehicle Operations (CVO), Intelligent Transportation System (ITS), and Advanced Traffic Management Systems (ATMS) that provides detection of traffic conditions in downtown Owen Sound and displays conditions at the approaches to the City along Highway 6 and 21 (approaching County Roads 11 and 18).
- Discourage truck traffic through the downtown core on 2nd Avenue East by encouraging truck traffic to utilize north / south through parallel routes such as 3rd Avenue East and 2nd Avenue West.



Traffic Calming

Traffic calming measures are being applied in both new developments and existing neighbourhoods in many Ontario municipalities, as a way to mitigate the adverse impacts of vehicular traffic (such as speeding and high volumes), and to improve the quality of life in the neighbourhoods.

The primary goals in developing a traffic calming policy is to reduce high traffic speeds and decrease through traffic on local roads to acceptable levels to maintain the liveability of residential neighbourhoods, maintain access and mobility of all users of the road allowance, and improve safety for pedestrians and motorists. Where possible, consideration should be given to maintaining or improving the aesthetics of the roadway.

Traffic Calming is seen as part of the City of Owen Sound Transportation Master Plan solution. It may be applicable on certain local roads to manage measured and documented operational problems. The draft Traffic Calming Policy recommended for the City of Owen Sound is provided in **Appendix I** of the Transportation Master Plan Report.

The evaluation of new traffic calming requests is typically coordinated with an annual construction schedule. Based on the typical cost of traffic calming measures, the required consultation efforts, and the staff resources, an overall amount of \$200,000 should be sufficient to complete up to three (3) traffic calming projects per year including the data collection, analysis, design and construction.

The number of traffic calming initiatives undertaken annually will depend on the number of requests received from the public, the merits of these requests, the funding allocated to the Operating and Capital Budgets for traffic calming projects and staff resources available. It is recommended that a list of projects will be maintained and updated annually. Where funding is limited, a phased project implementation plan should be considered.

Cycling Infrastructure Implementation

The benefits of cycling as an activity and mode of travel are well documented. The development of an active transportation strategy for the City of Owen Sound provides focus and direction in increasing bicycle use and realizing benefits that include:

- Integrating healthy, physical activity into everyday travel, fostering active lifestyles;
- Reducing transportation costs;
- Reducing traffic congestion and carbon dioxide emissions;
- Conserving energy resources; and
- Contributing to a more connected community.

In order to support cycling as a competitive mode of travel, there is a need to develop continuous and direct routes to cycling destinations within the City and to neighbouring municipalities. The public has indicated that a key factor affecting their decision to consider cycling to work is the need for safe and direct routes. The public had indicated a need for



well marked cycling “routes, paths, roads” and that there is a need for “more bike friendly designs of streets”.

Primary cycling routes are identified in the Official Plan Trail Master Plan. They provide opportunities for commuting along continuous corridors and provide connections key municipal destinations. Key destinations served by the planned routes are identified below.

- Downtown (eg. City Hall, Farmers’ Market, Public Library, Tom Thomson Art Gallery)
- Shopping centres (eg. Heritage Place Shopping Centre)
- Offices such as Grey County
- Institutional uses (including Georgian College, Grey Bruce Regional Health Centre)
- Community uses (eg. Harry Lumley Bayshore Community Centre, Victoria Park)

Secondary cycling routes supplement primary routes. They are the local and collector connections within the neighborhoods. Secondary connections can help to reduce traffic congestion and improve traffic safety around school zones and promote active, healthy living. It is recommended that additional routes be considered in conjunction with the school boards in developing cycle to school / walk to school programs. Key objectives for secondary cycling routes include:

1. Safe connections to the primary and off-road multi-use trail routes;
2. Opportunity to provide a parallel alternative routes to primary routes;
3. Provide connections to neighbourhood destinations such as schools; and,
4. Promote healthy and active living within communities by providing cycling opportunities.

Implementation of these routes is subject to further detailed assessment of feasibility and the determination of any local safety issues or impacts to operations such as street parking.

Short, medium and long-range targets for implementation of bicycle routes will be established. The first priorities will include routes that meet one or more of the following criteria:

- Develop a spine network of major north / south and east / west routes;
- Recognize the Downtown as the primary activity centre and destination;
- Connect to other key City destinations;
- Provide cycling route connectivity in cycling routes; and
- Achieve feasible low cost “early wins” to demonstrate successes.

Cycling functional reviews are recommended for each corridor to develop a design consistent with the design guidelines in this document, confirm that traffic and parking impacts are acceptable and ensure that the public is informed and have an opportunity to provide input. Prior to the reconstruction of any roadway identified in the cycling plan noted below, it is recommended that a cycling functional review be implemented.



North-South Routes
6 th Avenue West (1 st Street W. to 7 th Street W to Alpha Street)
2 nd Avenue West (6 th Street to 8 th Street)
1 st Avenue West (8 th Street W to 22 nd Street W)
West Waterfront (10 th Street W to 22 nd Street W)
East Waterfront – 3 rd Avenue East (10 th Street E to 36 th Street E)
2 nd Avenue East (Harrison Park to 7 th Street E)
4 th Avenue East – 15 th Street East - 5 th Avenue East (Harrison Park to 28 th Street E)
5 th Avenue East (7 th Street East to 10 th Street East)
7 th Avenue East (City Boundary to 10 th Street)) - <i>New Recommended Route</i>
8 th Avenue East (15 th Street East to 23 rd Street East) - <i>New Recommended Route</i>
16 th Avenue East (8 th Street E to 17 th Street E)
Former CP Railway (8 th Street E to 28 th Street E)
28 th Avenue East (Superior Street to 20 th Street E)
East-West Routes
6 th Street – Superior Street (Sydenham River to 28 th Avenue E)
8 th Street West (2 nd Avenue W to 28 th Avenue E)
11 th Street West (Alpha Street to 1 st Avenue W)
Alpha Street (West boundary to 4 th Street West)
16 th Street West (3 rd Street W to 8 th Street W)
15 th Street East – 10 th Street East (4 th Avenue E to Georgian College)
20 th Street East – 17 th Street East (Heritage Place to 28 th Avenue)

To support the network development, it is recommended that the City implement the following:

- Establish a signage (wayfinding) for corridors as the cycling network as route development
- Incorporate bicycle parking requirements for major developments within the zoning by-law
- Establish bicycle parking including covered bicycle parking a key multimodal transfer points and bicycle racks at key community destinations and throughout the downtown

An Active Transportation Plan that the City can implement is attached to the TMP Report in **Appendix H**.



Pedestrian Network and Crossings

We recommend that the City of Owen Sound should focus their efforts and funding towards the construction of missing links and providing connectivity for the sidewalk network. The feasibility of establishing pedestrian levels of service related to standards for the requirement of sidewalks on one or both sides of the street needs further assessment of the feasibility and cost implications. The ultimate plan for the development of the pedestrian environment will be the gradual completion of the planned pedestrian network shown in **Exhibit 4.8**.

The implementation and operation of pedestrian crossings in the City of Owen Sound will need to comply with the legislative context of the Ontario Traffic Act, have regard for best practices in pedestrian accommodation and meet the needs of the City of Owen Sound. The Highway Traffic Act indicates that when a pedestrian is about to step from the boulevard onto the roadway there are fundamentally two different forms of pedestrian crossing. The crossing may be either / or:

- A controlled crossing where vehicles must yield to pedestrians.
- An uncontrolled crossing where pedestrians must yield to vehicles.

It is recommended that the City of Owen Sound proactively address pedestrian safety needs and establish a program of reviews of pedestrian crossings either through on-going traffic operations studies or annual corridor reviews. It is recommended that pedestrian crossing features be implemented where warranted, where environmental conditions are consistent with other geometric and design requirements, and when funds are available within the City's capital programming process.

It is recommended that the City of Owen Sound reassess its pedestrian crossing policy with regard to recommended pedestrian features upon completion of OTM Book 15. Compliance with pedestrian crossing practices is recommended for regular review including identifying and programming the necessary roadway and traffic control modifications for implementation.

It is recommended that prior to the reconstruction of any roadway; it is recommended that a pedestrian infrastructure needs be reviewed including sidewalk and crossing infrastructure and that design criteria in this document be considered.



Transportation Demand Management

Transportation Demand Management (TDM) program will form part of the overall TMP strategy. Specific recommendations for TDM measures in Owen Sound include:

- Reviewing and modifying transit, cycling and pedestrian-related Official Plan policies to acknowledge their important role in City wide travel demand management.
- Reviewing and modifying site design guidelines, traffic impact study requirements and site plan approval process to encourage applicants to adopt TDM initiatives.
- Development of TDM supportive parking policy such as paid parking, shared parking and other parking management strategies.
- Development of Park and Ride lots located at the edges of the City to encourage transit usages as well as carpooling initiatives.
- Reviewing alternative work schedules at larger employment centres to encourage flexi-time, compressed work week, and staggered shifts to encourage peak travel to/from these employment areas to occur at different times of the days instead of one set time in the morning and one set time in the afternoon.
- Encourage the use of tele-commuting as a substitute of physical travel.
- Encourage the citizens of Owen Sound to be active and have a positive attitude toward reducing car use and relying on alternative forms transportation through promotional efforts.
- A staff position be created to support and manage all pedestrian, cycling, transit and TDM initiatives undertaken by the City to ensure compliance with the various polices and measures being recommended as part of the Transportation Master Plan.

I. Implementation

Cost Considerations

The timing and implement strategy of recommended road network improvements, pedestrian, cycling, TDM, transit and other support programs is directly related to cost and available budget. Funds will be necessary for the planning, design, property, utility impact mitigation, capital construction/acquisition and on-going operation and maintenance of new transportation infrastructure and services.

Preliminary cost estimates have been identified for identified improvements based on their anticipated need (i.e. short term, medium term, long term). The timing of improvements will be dependant on the City of Owen Sound capital budget approval process.

The management of the implementation of the City of Owen Sound Transportation Master Plan will require expertise and efforts beyond current staff levels of service. The implementation will require functional feasibility studies, engineering design and experience in alternative modes of travel. It is recommended that consideration be given to additional transportation engineering support in the form of allocation of staff resources (transportation engineer) or consultant support.



Infrastructure Cost

The recommended long-term transportation strategy will require an estimated \$5 million in capital projects and engineering studies. Additional costs will be associated with the administration, operation and maintenance of these improvements. Transit related costs will be determined through a separate Transit Strategy Study.

Funding Sources

Improvements to arterial roads and collector roads are under the jurisdiction of the City of Owen Sound. Improvements triggered by growth within the City are eligible for funding through City of Owen Sound Development Charges (DC) and Capital Program. It is recommended that the City develop/ update a development charge by-law to reflect the costs of identified improvements.

Expansion of pedestrian facilities, cycle paths and travel demand management services should be included in future development charge updates. Recognizing constraints on capital and operating budgets, alternative funding sources will be investigated. The following sections identify opportunities for federal, provincial, and third party funding sources. Below is a list of possible financial resources available to implement the Master Plan:

- Bicycle Trade Association of Canada
- Health Canada Grant/Contributions Program
- Ontario Cycling Association and International Mountain Biking Association
- Gas Tax Contributions
- Federal Government
- Ontario Transportation Demand Management Municipal Grant Program
- Provincial Government dedicated funding
- TD Friends of the Environment
- Shell Environment Fund
- Environment Canada – EcoAction Community Funding
- Trillium Foundation
- Communities in Action Fund
- Moving on Sustainable Transportation (MOST) program
- Developers or affected businesses

In order to make use of available external funding, the City of Owen Sound will need to develop projects within the scope of the master plan that are ‘shovel ready’.





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1. INTRODUCTION

1.1 Background

The City of Owen Sound has embarked on the development of a multifaceted and comprehensive Transportation Master Plan known as “**A Plan in Motion**”. The growth in population within the City its outlying areas, increasing traffic congestion in some areas of the City, and changing demographics and societal values, contribute to support for more sustainable modes of travel.

Transportation related opportunities and challenges have reinforced the need to develop a comprehensive transportation plan to better manage existing and future transportation infrastructure and to ensure that Owen Sound maintain its position as the key regional centre in Grey and Bruce Counties.

Owen Sound has a challenging environment in which two sets of important needs compete:

- The need to preserve a high standard of living for Owen Sound residents by managing growth, minimizing disruptions and impacts on the environment, and preserving the City’s unique character.
- The need to ensure that Owen Sound transportation network continues to provide sufficient capacity to maintain a strong competitive position to attract business and enhance economic vitality.

Owen Sound is regionally located in the north-east of Grey County, as illustrated in **Exhibit 1.1**. Owen Sound faces north-south and east-west pressures from provincial recreational travel, regional commuter traffic, and from development within the City itself. The transportation system in Owen Sound is therefore strongly affected by the transportation demands from neighbouring communities in Grey and Bruce Counties, as well as longer distance provincial traffic.

For example, Owen Sound is faced with the challenge of managing increasing east-west through traffic on the Provincial connecting links such as 10th Street, 9th Avenue East, and 16th Street East with much of the traffic originating from the north and west of Owen Sound destined to the commercial and institutional lands located in the eastern half of the City. The resulting congestion on 10th Street through the downtown area continues to increase pressure on collector and local roads in the City, increasing concerns of local residents over traffic infiltration, traffic impacts, and safety.



1.2 Purpose of the Transportation Master Plan

The City of Owen Sound Transportation Master Plan is a platform to move forward with the implementation of the transportation vision defined by the citizens in a workshop held in September, 2008 to develop the Terms of Reference for this TMP. This vision embraces sustainable development, protection of the natural environment, economic vitality, and a healthy community while providing safe, affordable, and efficient transportation for people, goods and services.

1.3 Why is a Transportation Plan Needed?

This 2010 TMP is a practical guide for implementing transportation investments, policies, and actions to the year 2026 and beyond. The guiding principles from this document firstly ensure consistency and help to achieve the goals and objectives of other City policies such as the Official Plan and the Strategic Plan. Secondly it provides for traceable recommendations to ensure that once they have been approved they can be implemented.

1.4 Goals and Objectives of the Master Transportation Study

The TMP provides comprehensive long term strategies (by 2011, 2016, 2026, and beyond) that will guide the City through the next 20 years of the development of its transportation system. The strategies are designed to manage growth and reduce traffic impacts by balancing forecast population and employment growth with the mobility needs of the City's residents. The TMP incorporates recent investments in infrastructure improvements, community goals and expectations and changes in transportation system planning from a sustainability perspective.

The study gives special consideration to:

- Developing a transportation system that will accommodate future population and employment growth to the year 2026 and beyond
- Building a sustainable transportation system
- Addressing current transportation challenges such as:
 - Congestion on arterial roads including 10th Street through the downtown core, and along other arterial roads such as 16th Street East and 9th Avenue East
- Considering the multi-modal character of transportation
- Promoting the use of transit
- Promoting travel demand management
- Considering the needs of cyclists and pedestrians
- Recognizing goods movement as a key component of economical vitality
- Public consultation
- Giving consideration to environmental effects



Exhibit 1.1

City of Owen Sound, Grey County, Ontario



1.5 Interdependent Transportation, Economic, Social, and Environmental Goals

The TMP considers a comprehensive, system-wide approach that includes, in addition to transportation goals, economic, social and environmental goals of the City. The following key points illustrate the importance of ensuring such interdependence:

- **The various goals should be mutually supportive** – Transportation goals will not be achieved unless other goals are achieved (and vice-versa). The various goals also influence each other. For example, economic vitality depends, in part, upon adequate transportation services but the demand for travel is in turn driven to some degree by economic growth.
- **The nature of personal travel and goods movement is highly complex and variable** – Municipal government alone cannot meet all these needs cost-effectively given today's constraints on public finances. Coordination with other governmental bodies, ability to seek and attract funding partners, and a careful valuation of the cost of growth becomes critical.
- **We cannot build our way out of congestion** – The need to develop and apply new transportation solutions geared at increased network efficiency maximizing the use of existing infrastructure, higher return on investment, and halting urban sprawl are pressing. Designing an integrated mobility system capable of addressing the needs of person travel and goods movement is essential.
- **The needs and expectations of society are changing** – New population driven factors have emerged and created new challenges for policy makers. Issues triggered by the aging population, increased growth pressure, and environmental protection have to be faced, resolved, and assimilated.
- **The need to protect our natural heritage is critical** – Transportation is known to be a significant source of air contaminants and of greenhouse gas emissions attributed to climate change and health problems. Decreasing auto dependence and shifting travel to more efficient and cleaner transportation modes is vital.

1.6 Transportation Master Plan and Environmental Assessment Process

The Owen Sound Transportation Master Plan (TMP) has been conducted in accordance with the master planning process outlined in the Municipal Class Environmental Assessment process (June 2000, Amended 2007) as approved by the Minister of the Environment.

The TMP study process addresses Phase 1 and Phase 2 of the environmental assessment process as shown in **Exhibit 1.2**. Phase 1 defines the problem or opportunity while Phase 2 identifies alternative solutions, considers a range of environmental implications of each solution, consults with the public and affected agencies, and selects the preferred solution(s).

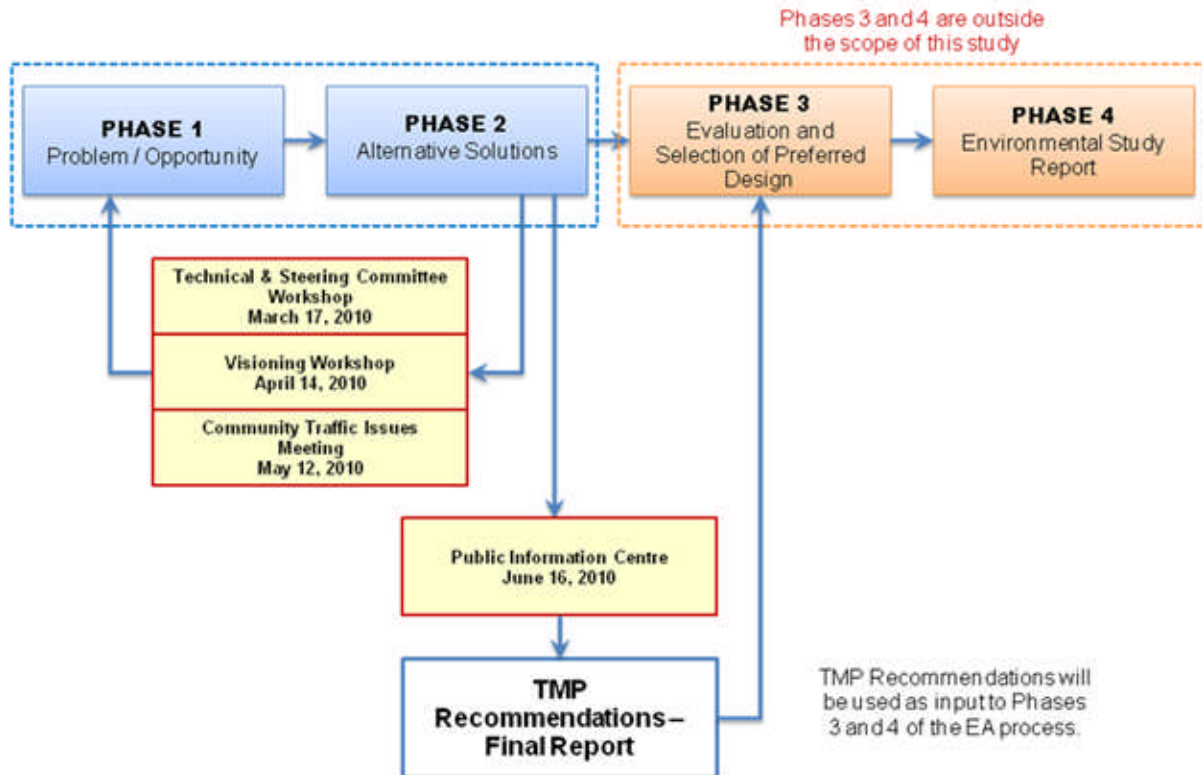


Exhibit 1.2: Class Environmental Assessment Process, Phase 1 and 2

The results of the Owen Sound TMP will constitute Phases 1 and 2 of the Environmental Assessment process and will be used as input into future environmental assessment studies for transportation projects arising from the recommendations of the study.

Public consultation was designed to:

- Provide open communication with the public, other municipalities, and agencies,
- Provide information to the public as a basis for engaging in active dialogue with the public and ensuring public participation,
- Seek the public’s input on the identification of issues, the development of alternative solutions, and the selection of the preferred alternative; and,
- Ensure that the plan has general support from the community.

Public consultation in this study has involved:

- Public notices of study commencement and of public meetings,
- References to the study through the City of Owen Sound web site,
- A Steering Committee meeting held at City Hall on March 17, 2010
- A Visioning Workshop held at Owen Sound & North Grey Union Public Library on April 14, 2010
- A Community Traffic Issues Meeting held at City Hall on May 12, 2010
- A Public Information Centre held at City Hall on June 16, 2010

Details on the public consultation process are provided in **Appendices A and B** and discussed further in **Section 2**.





1.7 A Sustainable Transportation Planning Approach

The Transportation Master Plan builds on the approaches and ideas conveyed in the *Sustainable Planning Guidelines* report (developed by Transport Canada and the Transportation Association of Canada), is supported by the Province of Ontario *Places to Grow Act*, and adheres to the Municipal Class Environmental Assessment process. This multilayered process ensures that the appropriate transportation investments, policies, and actions can be verified, proposed, accepted, and implemented to support goals of sustainability, economic vitality, and healthy communities.

The TMP process incorporated, to various degrees, the 12 key principles identified by Transport Canada for sustainable transportation planning as featured in **Exhibit 1.3**.

Key Principles for Sustainable Transportation Planning	
Sustainable Communities & Transportation Systems	Sustainable & Effective Transportation Planning
<i>Principle 1:</i> Integration with land use planning	<i>Principle 7:</i> Strategic approach
<i>Principle 2:</i> Environmental health	<i>Principle 8:</i> Implementation guidance
<i>Principle 3:</i> Economic and social objectives	<i>Principle 9:</i> Financial guidance
<i>Principle 4:</i> Modal sustainability	<i>Principle 10:</i> Performance measurement
<i>Principle 5:</i> Transportation demand management	<i>Principle 11:</i> Public involvement
<i>Principle 6:</i> Transportation supply management	<i>Principle 12:</i> Plan maintenance

Exhibit 1.3: Key Principles for Sustainable Transportation Planning, Transport Canada

1.8 Study Organization

The study was jointly directed by Mr. Chris Webb, Manager of Engineering Services, and Mr. Jim Coburn, former Traffic Coordinator for the City of Owen Sound. The consultant project team was led by Mr. Ray Bacquie of HDR | iTRANS. He was supported by Mr. Stewart Elkins who served as Team Leader.

The Steering Committee consisted of the representatives of the following agencies and departments:

- City of Owen Sound Engineering Services Division
- City of Owen Sound Planning Division
- City of Owen Sound Operations Advisory Committee
- County of Grey
- Ministry of Transportation Ontario



2. PUBLIC CONSULTATION PROCESS

2.1 Description of the Public Consultation Process

The public consultation process was an essential component of the study. Considering the population characteristics in the Study Area and localized transportation issues, there were moderate levels of public interest. The public consultation program contained the following components:

- **Steering Committee Meetings** – These meetings provided for an exchange of ideas between the City and the Consultation team.
- **Visioning Workshop** – A Visioning Workshop was formed to allow citizens and individuals representing groups, agencies and organizations a special opportunity to provide input early on in the study and to provide feedback on preliminary alternatives. The Visioning Workshop is described in greater detail in **Section 2.2**.
- **Community Traffic Issues Meeting** – A meeting with the City of Owen Sound Operations Committee and citizens about community traffic issues in known “hot spots” was arranged to allow individuals to provide feedback about their concerns and suggestions how to mitigate the traffic issues in their community. The Community Traffic Issues Meeting is described in greater detail in **Section 2.2**.
- **Public Information Centre (PIC)** – One formal meeting was held during the Study, consisting of an open house format with display panels and a formal presentation followed by a discussion session. The PIC is described in greater detail in **Section 2.2**.
- **Newspaper Advertisements** – Advertisements were placed in the local newspaper to announce the Notice of Study Commencement, the Visioning Workshop, and the PIC. Notices were hand delivered to specific neighbourhoods to advise of the Community Issues Meeting. The newspaper advertisements invited the public to attend the meetings and to provide input. The advertisements provided information on contact names, telephone numbers, and addresses.

2.2 Workshop and Public Information Centre

2.2.1 Visioning Workshop – April 14, 2010

The Visioning Workshop was open to all citizens and stakeholders. A “stakeholder” was generally an individual representing a group, agency or organization that has a particular interest in the Study Area. Government agencies, environmental groups, ratepayers’ associations and land developers are examples of typical stakeholders who could attend.

The Visioning Workshop was held on April 14, 2010 between 6:00 PM and 9:00 PM. Poster boards about the project were displayed on easels and attendees were provided with the opportunity to examine them. HDR | iTRANS led a presentation describing the existing



transportation conditions, future transportation conditions (2026), and some preliminary alternatives. The alternatives were used primarily to solicit input from the group and gauge their acceptability. Attendees also had the opportunity to provide feedback about the study by completing and submitting comment sheets about the analysis and proposed alternatives.

Approximately 20 individuals attended the Visioning Workshop in the lower auditorium of the Owen Sound & North Grey Union Public Library in Owen Sound. The following topics were covered at the workshop:

- Existing Conditions
- Draft Problem and Opportunity Statement
- Alternate Route Alternative
- One-Way Paring of 8th Street and 9th Street Alternative
- Cycle Spine Lane Network Alternatives
- Alternative River and Harbour Crossings
- Community Traffic Issues – “Hot Spots”

More details of the Visioning Workshop are available in **Appendix A1**.

2.2.2 Community Traffic Issues Meeting – May 12, 2010

A Community Traffic Issues meeting was held on May 12, 2010 between 6:00 PM and 9:00 PM. HDR | iTRANS led a presentation which included an overview / primer on traffic calming, as well as the data collection, assessment, and alternatives for each of the three roadways which included Alpha Street, Moores Hill, and 15th Street “A” East. Attendees provided feedback to the City’s Operations Committee as well as the Consultant. Residents also had the opportunity to provide feedback about the study by completing and submitting comment sheets about the findings and proposed alternatives developed for each of the roadways.

Approximately 40 individuals attended the Community Traffic Issues Meeting in the City Hall Council Chambers. The following topics were covered at the meeting:

- Traffic Calming Primer
- Alpha Street:
 - Existing Conditions
 - List and Evaluation of Alternatives
 - Preferred Alternative
- Moores Hill:
 - Existing Conditions
 - List and Evaluation of Alternatives
 - Preferred Alternative
- 15th Street ‘A’ East:
 - Existing Conditions
 - List and Evaluation of Alternatives
 - Preferred Alternative

More details of the Community Issues Meeting are available in **Appendix A2**.



2.2.3 Public Information Centre – June 16, 2010

The purpose of the PIC was to present the following topics to the public for their input and comments:

- Study Background
- Problem and Opportunity Statement
- List of Alternatives
- Draft Evaluation of Alternatives
- Draft Recommended Alternatives

The public responses will be used to refine the preliminary preferred alternatives and select the preferred alternative.

More details of the Public Information Centre are available in **Appendix A3**.

2.3 Comments Received and Project Team Responses

All comments received from the public, stakeholders, and agencies throughout the study were recorded by the project team. **Appendix A4** summarizes public and stakeholder comments received throughout the study. The input received throughout the course of the study was very important with respect to the direction the study took, the alternatives that were assessed and carried forward, and the emphasis that was placed on various aspects of the transportation network.



3. BACKGROUND DOCUMENTS

3.1 Policy Documents

To guide the Transportation Master Plan within the context of the overall direction provided by Provincial policy, Grey county policy and City of Owen Sound strategic policy direction was reviewed at the outset of the study. This Chapter provides a brief summary of key background polices that have shaped and influenced the development of the current transportation system in Owen Sound and provide direction for the future.

3.1.1 Ontario Provincial Policy

In the Ontario Government report *Provincial Policy Statement 2005*, provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial “policy-led” planning system. The statement includes direction on Transportation Systems and Transportation and Infrastructure Corridors. The following transportation policies have been identified to be used as guidelines in developing a Transportation Master Plan:

- 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 including connections which cross jurisdictional boundaries.
- A land use pattern, density and mix of uses should be promoted that minimize the length and number of vehicle trips and support the development of viable choices and plans for public transit and other alternative transportation modes, including commuter rail and bus.
- Transportation and land use considerations shall be integrated at all stages of the planning process.
- 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 purpose(s) 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 the significant resources in Section 2: *Wise Use and Management of Resources*.



3.1.2 Grey County Policy

The Grey County Official Plan, *County of Grey Official Plan 2000*, provides direction on growth within the County. Policies provide primary direction on County roads and coordination between levels of government in developing the transportation system. Key County transportation policies are summarized as follows:

- The County does not support the abandonment of railway operations but where rail right-of-way closures are being considered, a public hearing should be held. The County and/or local municipal councils shall give consideration to the purchase of a closed right-of-way where it is feasible to do so.
- The County shall take measures to ensure that the movement of hazardous materials takes place in a manner which minimizes the risk to local residents and the natural environment.
- County Roads generally be a 20 metre right-of-way width
- The scenic qualities of road corridors will be considered when undertaking road improvements along County Roads. Attempts will be made to retain or otherwise protect scenic features located within the road allowance but only when traffic safety can be maintained.

Within the Niagara Escarpment Plan the policies of this Section apply, however only essential transportation and utility facilities are permitted in Escarpment Natural Area and Mineral Resource Extraction Areas.

3.1.3 City of Owen Sound Policy

The City of Owen Sound developed a strategic plan in 2008 *Strategic Plan for the Corporation of the City of Owen Sound*, to provide overall corporate direction for the City. It states that Owen Sound's vision is to be a community of choice for all, distinguishable by its authenticity, natural amenities, diversity and community spirit. It notes that the City of Owen Sound governs and advocates on behalf of all citizens by providing infrastructure and services which respect the environment and allow individuals and businesses to prosper.

Key City of Owen Sound transportation policies that provide direction to the development of the TMP are summarized as follows:

- The City should provide a specialized transit service for people throughout the week with mobility problems to provide equitable access for persons with disabilities.
- The City should ensure the provision of adequate parking facilities to serve the downtown area.
- The City should develop an updated Transportation Plan for the City, which makes provision for projected east/west traffic movements.
- The City should complete a comprehensive Bicycle Master Plan for the community including links between residential and business areas and make provision for bicycle parking.



The *Owen Sound Official Plan, March 2006* provides direction on growth within the City. It identifies goals and objectives, land use policies, transportation and municipal services policies and direction on implementation. Key transportation policies related to the development of the TMP include the following:

- The City shall establish a coordinated transportation system in accordance with Schedule “C” – Transportation Plan, designed to facilitate the satisfactory movement of both people and goods. The transportation system is intended to facilitate safe and efficient movement of traffic between areas within the City as well as to ensure traffic movement through the City and external linkages with the overall transportation system in the regional setting.
- Within 5 years from the adoption of this Plan an updated Transportation Plan should be developed and updated in conjunction with Official Plan reviews which provides for projected east/west traffic movements, and other initiatives necessary to ensure an efficient, reliable and safe transportation system in the City.
- The City shall ensure a bridge corridor is maintained, free of significant development, through the lands east of 1st Avenue West at the end of 14th Street West and 12th Street West so as to leave various options open for a future bridge across the inner harbour. An alternative bridge route is along 11th Street West/11th Street East. Where private lands are proposed for development within this corridor the City may require the dedication of land for the purposes of securing ownership of the said corridor. The final route is to be determined by the Transportation Plan referred to in Section 6.1.1.2 of the Official Plan. The final route as determined by Council may require an amendment to this Plan.
- The preservation and reuse of abandoned rail corridors shall continue to be encouraged and the pedestrian paths existing on abandoned rail corridors shall be maintained. Rail corridors into the City through to industrial areas shall be preserved and re-used. Rail corridors along the waterfront and Downtown may be transferred, relocated and redeveloped where a more favourable waterfront location or similar site preserving public access is determined.
- A viable public transit system which supports alternate modes of transportation such as walking and cycling will be supported by encouraging a land use pattern, density and mix of uses that reduces the growth in the length and number of vehicle trips.
- The City will encourage the use of future technologies that will support a safe and efficient transportation system.

3.2 Data Sources

Land use data for this study were obtained from the City of Owen Sound Planning Department. Traffic data were obtained from City of Owen Sound, Grey County, and the Ministry of Transportation Ontario (MTO). To supplement available traffic data, HDR | iTRANS commissioned Pyramid Traffic Inc. to conduct extensive traffic volume and origin-destination data as part of the TMP study.



4. EXISTING CONDITIONS

4.1 Socio-Economic Environment

4.1.1 Population and Employment

4.1.1.1 Existing Population

Based on previous Statistics Canada census data, like many smaller cities in Ontario, Owen Sound experienced only a modest rate of population growth between 1981 and 2006. The average annual growth rate was calculated at 0.38%, compared to the average annual population growth rate for the Province of Ontario of 1.64%. The historic population data is summarized in **Table 4.1**. Further information is provided by Grey Bruce Health Unit in **Appendix B**.

Table 4.1: Owen Sound Population Data

Census Year	City of Owen Sound	Ontario
1981	19,833	8,625,107
1986	19,804	9,101,694
1991	21,674	10,084,885
1996	21,390	10,753,573
2001	21,431	11,410,046
2006	21,753	12,160,282
Average Annual Growth Rate from 1981 to 2006	0.38%	1.64%

4.1.1.2 Projected Population

Based on the average annual growth rate of 0.38% calculated from historic Stats Canada census data, the forecasted growth of the City of Owen Sound is shown in **Table 4.2**.

Table 4.2: Owen Sound Population Projection Based on Historic Growth

	2011	2016	2026
Projected Population	22,002	22,423	23,290

From the report *Owen Sound Official Plan Background Study*, prepared by The Biglieri Group Ltd in October 2003, there are three scenarios that were used for the population projection in the City of Owen Sound. The three scenarios used were:

- **Share of Growth** – were is was assumed that the City of Owen Sound will receive about 24.5% of the growth in Grey County
- **Slow Growth** – were migration for each age group is assumed to be at the same rate as for 1996 to 2001
- **Economic Revival** – were the out-migration rate of young people is gradually reduced and the in-migration rates for other age groups gradually increase.

The projected population based on the three scenarios is summarized in **Table 4.3**.



Table 4.3: Population Projection in the City of Owen Sound

	2011	2016	2026
Share of Growth	21,740	22,467	23,472
Slow Growth	21,173	20,894	20,245
Economic Revival	22,830	24,139	27,558

Based on *Grey County Growth Management Strategy Report* prepared by Malone Given Parsons Ltd. and the Centre for Spatial Economic in April 2008, population projections for the City of Owen Sound are quite different from the *Owen Sound Official Plan Background Study*. The County projected population for the City of Owen Sound is summarized in **Table 4.4**.

Table 4.4: Population Projection for the City of Owen Sound (Grey County)

	2011	2016	2026
Projected Population	23,400	24,000	24,900

As shown in the above three tables, there is modest growth expected to occur in the City of Owen Sound over the long term. The projected population of Owen Sound in 2026 can be expected to be between 23,300 and 27,600 persons. This does not include population projections for the surrounding areas, but it can be assumed that they will grow at a similar rate to that of the City of Owen Sound.

4.1.1.3 Existing Employment

Based on Statistics Canada census data, the amount of employment in the City of Owen Sound is summarized in **Table 4.5**. Compared to the unemployment rate for the province of Ontario, the City of Owen Sound has historically had a higher unemployment rate.

Table 4.5: Owen Sound Existing Employment

Census Year	City of Owen Sound	Ontario
1996		
Persons in the labour force	9,826	5,539,738
Employed	8,805	5,077,670
Unemployment Rate	11.6%	9.1%
2006		
Persons in the labour force	10,780	6,587,580
Employed	9,980	6,164,245
Unemployment Rate	7.4%	6.4%

4.1.1.4 Projected Employment

Based on the *Grey County Growth Management Strategy Report* prepared by Malone Given Parsons Ltd. and the Centre for Spatial Economic in April 2008, the employment projections for the City of Owen Sound are summarized in **Table 4.6**.



Table 4.6: Employment Projections for the City of Owen Sound

	2011	2016	2026
Projected Employment	13,900	14,200	14,400

Employment growth is expected to be slow in the City of Owen Sound with a net increase of 500 jobs over the next 15 years. The detailed demographic were attached in **Appendix C**.

4.1.2 Existing Land Uses

Existing land uses in the Study Area are summarized in Schedule ‘A’ from the Owen Sound Official Plan as illustrated in **Exhibit 4.1**. The major ‘attraction’ land uses in the City include:

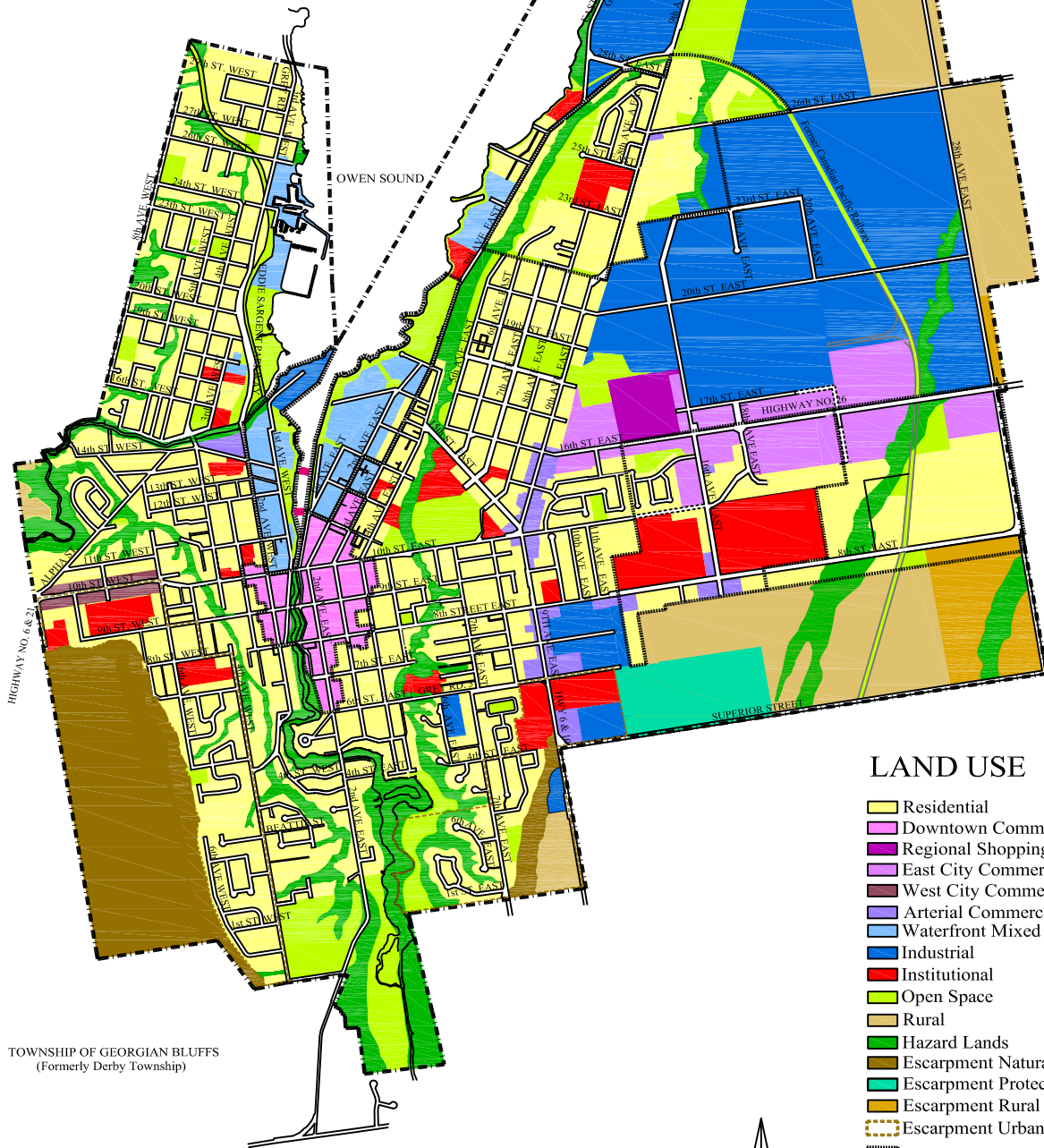
- **Commercial** – There are three main commercial areas within the City of Owen Sound. The first area is its Downtown Core (centred on 2nd Avenue East). The Downtown Core is comprised of mainly independent stores mixed with office space and residential apartments. The second area is a highway commercial area along 20th Street East. This is comprised mainly of regional shopping destinations such as Heritage Place Mall and big box retailers such as Wal-Mart, Home Depot, and Canadian Tire. There is also a smaller highway commercial area situated on 10th Street West between 6th Avenue West and 9th Avenue West. Outside of the City’s boundary, there is additional highway commercial on Highways 6 and 21.
- **Industrial** - The main industrial area is located in the north-eastern area of the City centred around 20th Street East and 16th Avenue East. This area comprises light industry (warehousing) to heavy industrial (manufacturing) land uses. There is also a marine industrial area located on both sides of Owen Sound harbour where large grain / other aggregate silos are situated for interim storage before being transported by ground transport and marine vessels.
- **Institutional** - There are several large institutional land uses that draw significant trips. These include the Grey-Bruce Health Services Hospital, Georgian College, and Owen Sound Collegiate and Vocational Institute on 8th Street East, the Government of Ontario Regional Court House on 9th Avenue East, West Hill Secondary School on 9th Street West, and St. Mary’s Catholic Secondary School on 15th Street East.
- **Recreational** - There are also several recreational areas that can draw significant number of trips. These include the Regional Recreational Centre (currently under construction), Bayshore Community Arena, Duncan McClellan Park, Harrison Park, Kelso Beach Park, and the Bruce Trail.
- **Residential** - The majority of residential land uses in the City of Owen Sound are comprised of low density, single family units at the north of the City. The single family units in the river valley floor are older units more densely spaced units. Medium and higher density residential units are scattered throughout the City.



MUNICIPALITY OF GEORGIAN BLUFFS
(Formerly Sarawak Township)

GEORGIAN BAY

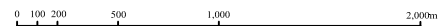
MUNICIPALITY OF MEAFORD
(Formerly Sydenham Township)



TOWNSHIP OF GEORGIAN BLUFFS
(Formerly Derby Township)

LAND USE

- Residential
- Downtown Commercial
- Regional Shopping Centre
- East City Commercial
- West City Commercial
- Arterial Commercial
- Waterfront Mixed Use
- Industrial
- Institutional
- Open Space
- Rural
- Hazard Lands
- Escarpment Natural
- Escarpment Protection
- Escarpment Rural
- Escarpment Urban
- Planning Area Boundary
- Planned Road
- Future Bridge Alignment Option



CITY OF OWEN SOUND OFFICIAL PLAN

3	OPA #3 By-Law 2007-143: IMPLEMENTATION OF BILL 51
No.	REVISION

SCHEDULE 'A'

Exhibit 4.1

Schedule 'A' from Owen Sound Official Plan

Not To Scale
September 2010

HDR | iTRANS
Project # 5454



4.1.3 Development Activity

As identified in the Owen Sound Official Plan, the majority of future development is anticipated to occur in the east side of the city in and around the 8th Street East and 16th Street East area. The majority of future development will likely take the form of commercial and residential land uses.

4.2 Socio-Cultural Heritage Environment

A Stage 1 archaeological assessment was conducted in September 2009 to determine the presence of and/or potential for any heritage resources that might be extant in the study area and, if so, what steps need to be taken for their management. The survey was conducted in accordance with the Ministry of Culture (MoC) guidelines for lands, which exhibit a moderate to high heritage potential. A number of sites within the Study Area have been registered with the City of Owen Sound Heritage Register, and have been identified as having heritage value or interest by other studies. There is a concentration of heritage sites in the downtown area of the City. The 24 listed heritage buildings are illustrated in **Exhibit 4.2**. The detailed cultural heritage report is included in **Appendix D**.

4.3 Natural Environment

4.3.1 Key Environmental Features

Natural Resource Solutions Inc. (NRSI) was retained by HDR | iTRANS as part of the Transportation Master Plan. NRSI's role was to compile background information on environmental constraints within the study area and produce a stand alone summary report. The Ecological Constraints Analysis Report dated October, 2009 provides a summary of the natural environment constraints, found in the study area, as input to the development of ecologically sensitive transportation options.

The ecological constraint mapping shown on **Exhibit 4.3** identifies significant natural features including aquatic habitats, woodlands, wetlands, significant plant and wildlife species and designated significant natural areas. Some of these designations are overlapping which identifies that there are various areas, some within, and some just out-side of the City limits, which have multiple constraints. The greater the number of constraints identified for a given area, the greater the potential for impacts. Future proposed transportation upgrades proximal to these features will likely require feature-specific studies to determine the precise boundaries and extent of the feature, as well as suitable protection measures such as buffers. Permits from the GSCA, DFO and MNR may also be required. The detailed report is attached in **Appendix E**.



Owen Sound Heritage Designation Register

1. Arthur Woods Manley Building - 964-966 2nd Avenue East
2. Beth Ezekiel Synagogue - 313 11th Street East
3. Coates & Best Building - 883 2nd Avenue East
4. The Market Building - 114 8th Street East
5. McKay Brothers Limited - 942 2nd Avenue East
6. Old Bus Terminal - 1023 2nd Avenue East
7. Old Post Office - 291 9th Street East
8. Peoples Department Store - 964 2nd Avenue East
9. Reitmans - 992 2nd Avenue East
10. Seldon House - 1005 2nd Avenue East
11. Sloan Building - 229 10th Street East
12. Whole Foods Store - 941 2nd Avenue East
13. Old Grey County Courthouse - 1235 3rd Avenue East
14. John Chisholm Home - 1379 3rd Avenue East
15. St. Mary of the Assumption Church - 554 15th Street East
16. F.N. D'Orr LePan Cottage - 861 5th Avenue East
17. Atkins Residence - 215 8th Street West
18. Billy Bishop Home - 948 3rd Avenue West
19. Christian Science Society - 900 1st Avenue West
20. Wilcox/Bowman Home - 606 2nd Avenue West
21. British Methodist Episcopal Church - 245 11th Street West
22. Central Westside United Church - 310 10th Street West
23. F.W. Harrison Home - 1050 4th Avenue West

Exhibit 4.2

Heritage Designation Register

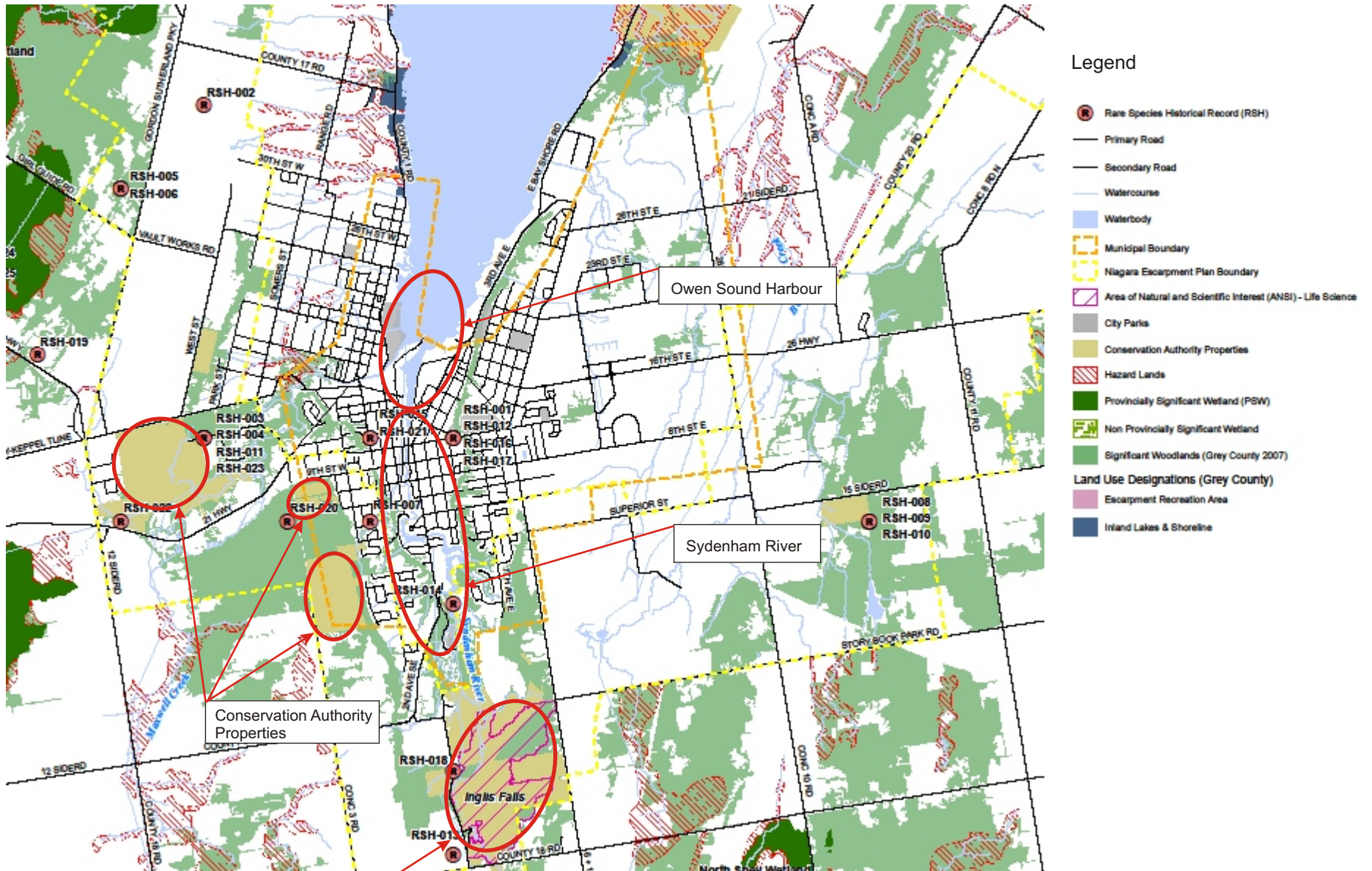


Exhibit 4.3

Ecological Constraints

Area of Natural and Scientific Interest (ANSI) - Life Science



4.4 Existing Transportation Network

This section discusses the existing transportation network in Owen Sound.

4.4.1 Road Network

The main road network within the study area includes Provincial Highways, County of Grey Roads, and municipal Arterial and Collector Roads.

The East-West road network is discontinuous due to the topographic nature of the land with limited connections up either side of the Escarpment. As a result, some of the existing roads in Owen Sound that do ascend/descend the Escarpment experience capacity and congestion problems today. Congestion (especially on 10th Street) also leads to traffic spilling over onto residential collector roads, raising residents concerns over traffic infiltration, safety, and speeding in residential areas.

Exhibit 4.4 illustrates the major road network in Owen Sound, while **Exhibit 4.5** shows the existing number of travel lanes.

4.4.2 Transit Services

The City of Owen Sound operates both a Conventional Transit and a Specialized Transit service.

Conventional Transit

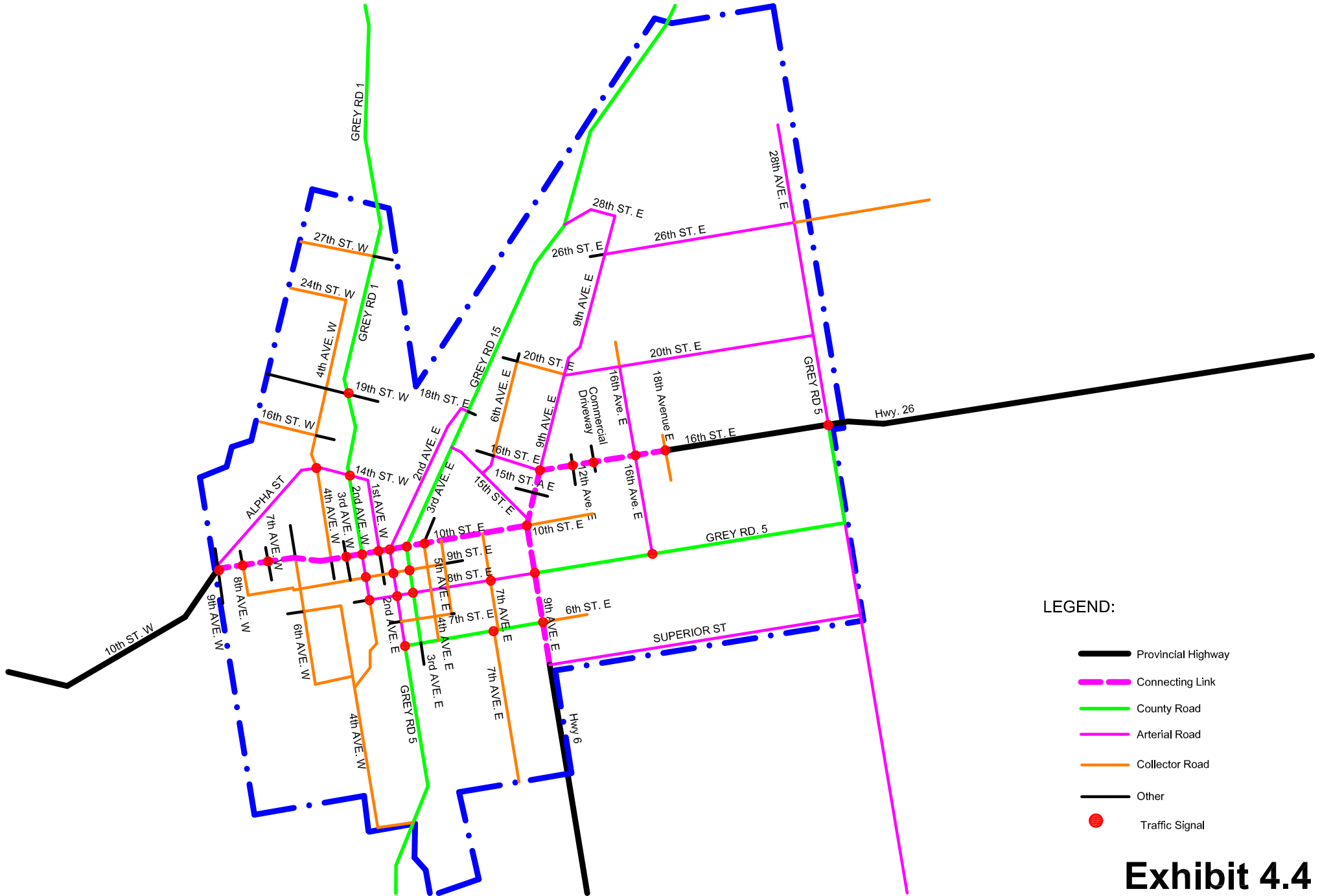
The Conventional Transit service is provided via four (4) routes. All four routes provide half hour service from 6:30 AM to 6:00 PM Monday through Friday. On Saturdays, bus service operates between 9:00 AM and 5:30 PM.

The City's new Eldorado Low Floor Buses were put into service in September 2005 and are fully accessible to everyone. They have a kneeling feature which lowers the height of the bus approximately three (3) inches for ease of entry as well as ramps at the front and rear doors for loading and unloading a wheelchair or scooter. They also have bicycle racks installed on the front of the bus that can accommodate two bicycles.

Dial-A-Bus Service is a complementary service to the four route system. For transit service from the terminal to East Bay Shore Road and the industrial park or from East Bay Shore Road and the industrial park to the terminal riders are supposed to phone one hour in advance for pick-up. The bus routes are shown in **Exhibit 4.6**.

Specialized Transit

The Specialized Transit service provides a door-to-door transportation service for residents of the City with mobility limitations that restrict their ability to use the Conventional Transit service. The service uses a wheelchair accessible bus and operates 5 days a week Monday to Friday from 8:00 AM to 5:00 PM.



LEGEND:

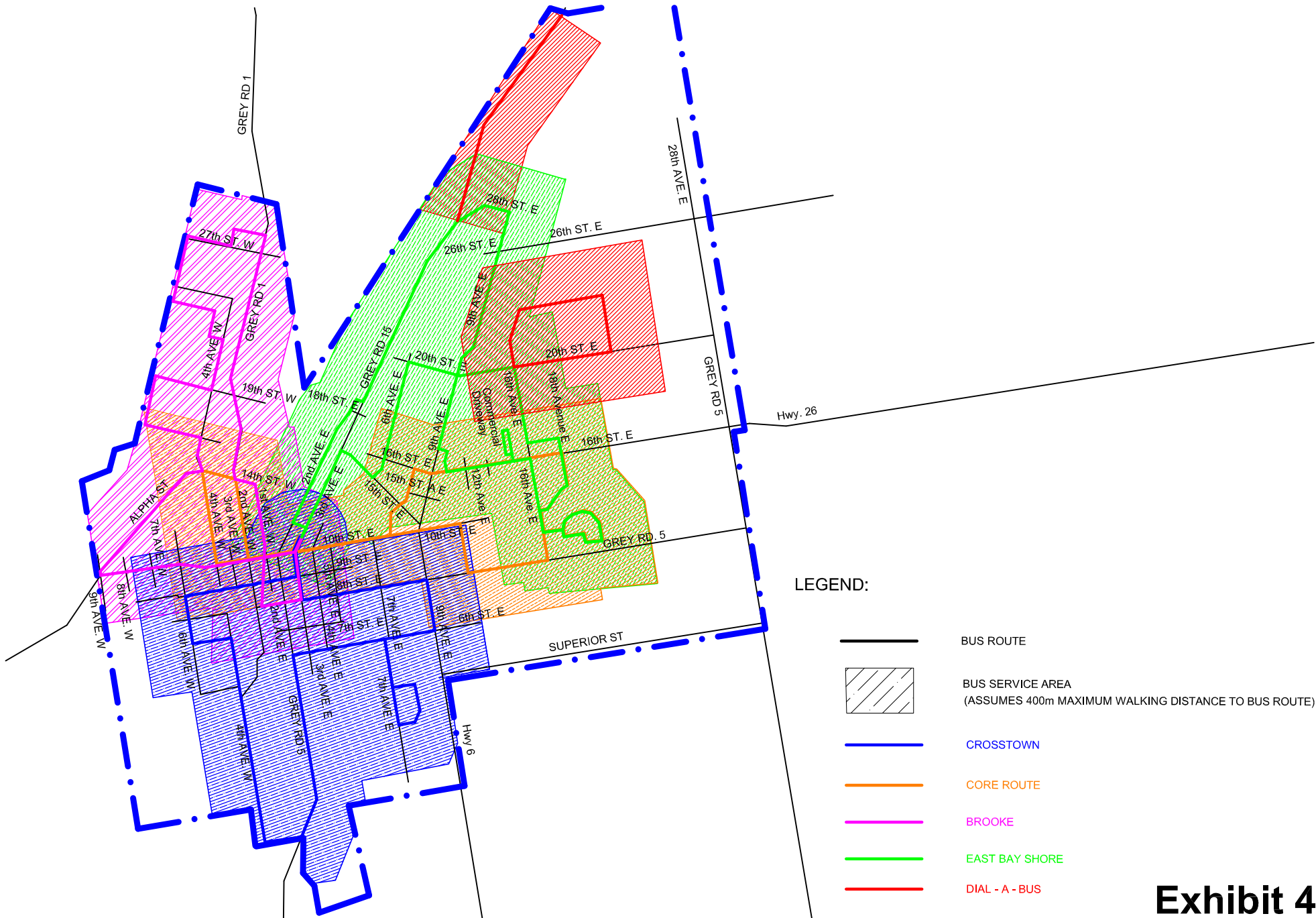
- Provincial Highway
- Connecting Link
- County Road
- Arterial Road
- Collector Road
- Other
- Traffic Signal

Not to Scale

September 2010

Exhibit 4.4 Major Road Network

HDR | iTRANS
Project #5454



LEGEND:


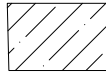





-  BUS ROUTE
-  BUS SERVICE AREA
(ASSUMES 400m MAXIMUM WALKING DISTANCE TO BUS ROUTE)
-  CROSSTOWN
-  CORE ROUTE
-  BROOKE
-  EAST BAY SHORE
-  DIAL - A - BUS

Exhibit 4.6 Owen Sound Transit Route Map



To be able to use this service an Application Form must be completed and submitted to the City for approval. Once approved the applicant is issued an Owen Sound Specialized Transit Card and Identification Number which is used when booking the door-to-door transit service. Approval to use the service must be renewed every two (2) years.

Both transit services are operated out of the Owen Sound Transit Terminal located at 1020-3rd Avenue East. Thomas Norris Limited provides the transit services under contract with the City of Owen Sound.

Inter-City Bus Transit

Intercity bus service is also available from the Transit Terminal by Greyhound Bus Lines. Grey Bruce Air Bus provides transportation service to Pearson Airport in Toronto and Aboutown Transit provides transportation to the London area.

4.4.3 Goods Movement

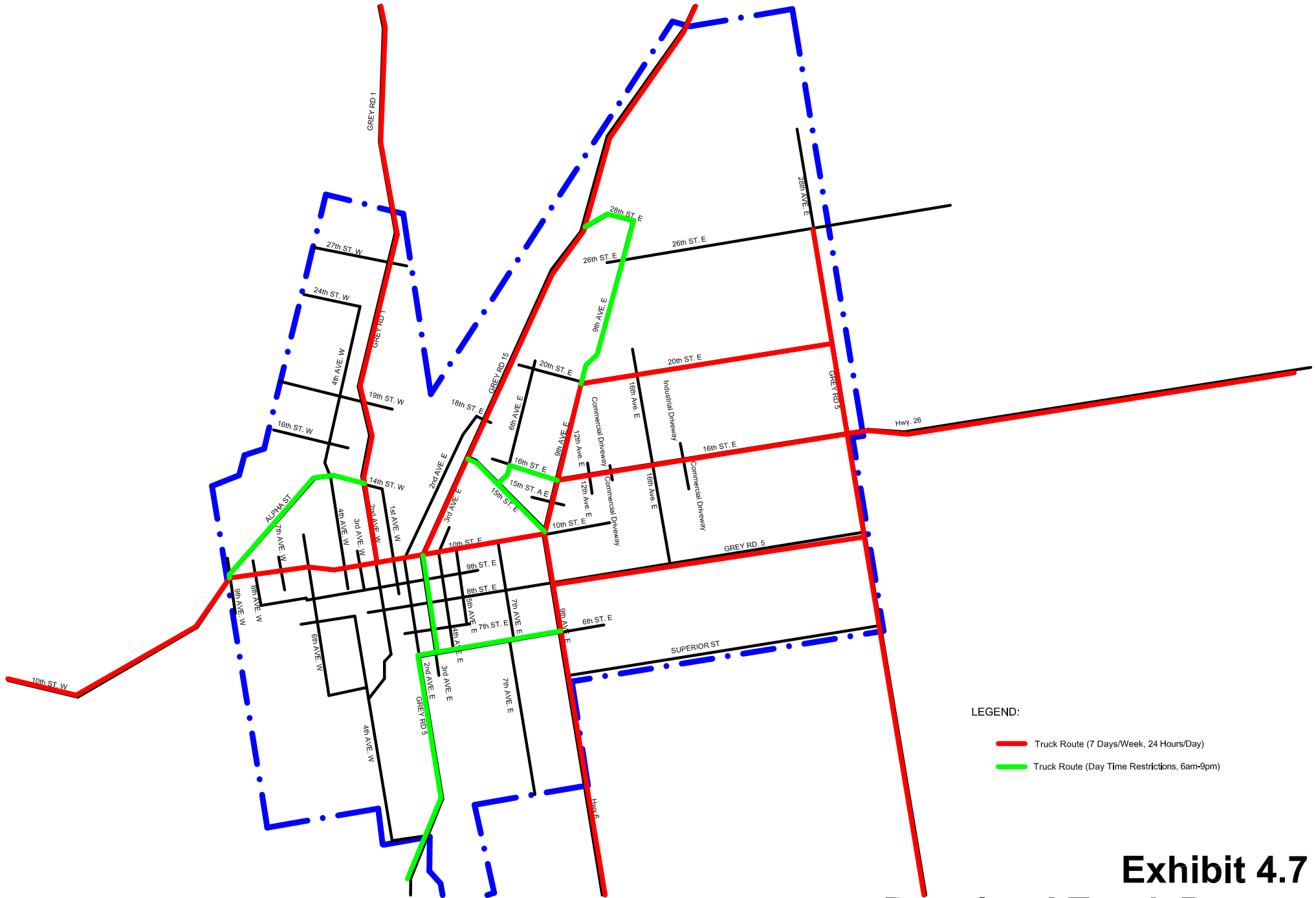
The volume of goods moved to, from, and through the City is substantial. The major generators of goods movement in Owen Sound are the industrial and employment areas north of 16th Avenue East, and the area around the harbour and 14th Street West. The Provincial highways (Highways 6, 10, 21, and 26) provide access for trucks to the transportation networks of Southern Ontario, the Great Lakes, Canada, and the United States.

Truck movements generally take place on the highways, arterial roads, and industrial collector roads. Trucks are restricted in residential areas. The permitted truck routes are illustrated in **Exhibit 4.7**.

The arterial road links with the highest daily truck volumes and / or percentage of total vehicles are shown in **Table 4.7**.

Table 4.7: 2009 Owen Sound Heavy Vehicle Cordon Counts

2009 PM Peak Hour Traffic Count	Total Volume	Truck Percentage
Alpha Street North of 11th Street West	401	2.7%
10th Street W East of 9th Avenue West	1800	2.4%
Eddie Sergent Pkwy North of 19th Street West	836	2.4%
10th Street W East of 2nd Avenue West	1534	2.9%
9th Street W East of 2nd Avenue West	564	1.1%
8th Street W East of 2nd Avenue West	813	1.6%
9th Avenue East South of 20th Street East	453	4.6%
16th Street East East of 18th Avenue East	487	6.0%
8th Street East East of 16th Avenue East	440	4.6%
20th Street East East of 16th Avenue East	341	9.1%
9th Avenue East South of 6th Street East	850	3.3%



LEGEND:

- Truck Route (7 Days/Week, 24 Hours/Day)
- Truck Route (Day Time Restrictions, 6am-9pm)

Exhibit 4.7 Permitted Truck Routes



4.4.4 Sidewalks and Bicycle Paths

The City currently accommodates pedestrians and cyclists within roadway corridors and along trails. These features include:

- Hard and soft surface trails and on-road connections,
- Sidewalks, typically adjacent to public roadways; and,
- On-road cycling permitted on local, collector and arterial roadways (but not marked as formal cycling routes).

The existing walking network is shown in **Exhibit 4.8**. There is currently a grid of pedestrian connections throughout the urban portion of the City. Sidewalks are provided on most County roads, arterial roads and collector roads on one or both sides of the road. The trail system also provides pedestrian connections.

The City of Owen Sound has planned a network of walk and cycle trails providing connections with recreational activities. The City Park Trails Master Plan of City of Owen Sound Official Plan identifies the planned walking trail and cycling network that is shown in **Exhibit 4.9**. The on-road cycling network has not been developed and existing cycling facilities that are separated from vehicles is limited to the off-road trail system.

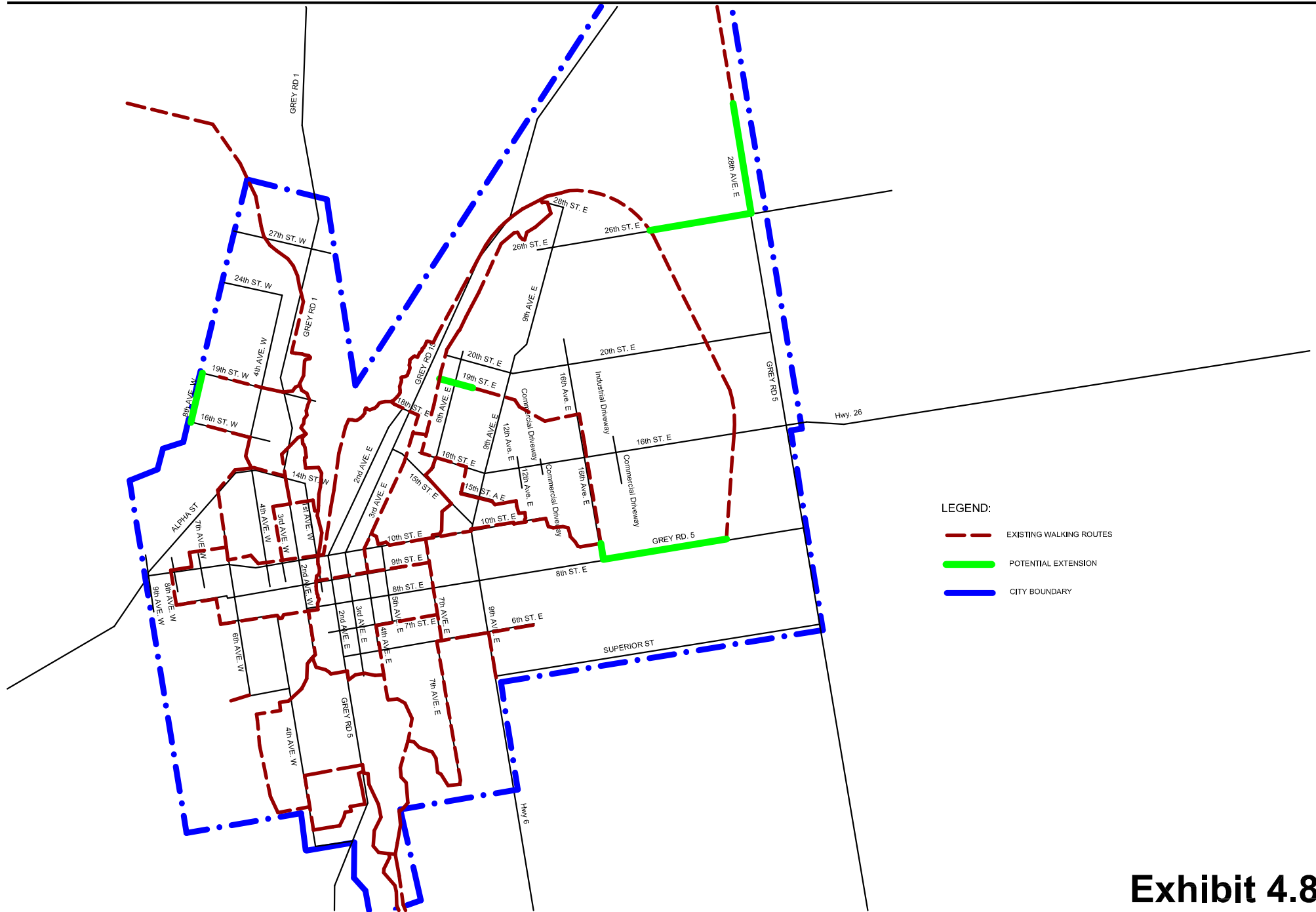
Based on our review of the planned walking network, there are a couple of missing links including a missing sidewalk link on 19th Street East from 7th Avenue East to 5th Avenue East, a missing link along 8th Street East (Grey Road 5) from 16th Avenue to the Railway Line, and 8th Avenue West from 16th Street West to 19th Street West. The feasibility and cost implications of these connections require further investigation

For cycling network, there are several short distance “missing links” that would help provide network continuity and complete the proposed network. The following links may be considered further as opportunities to complete the planned network:

- 6th Street East and Superior Street – Provides an additional east-west corridor to a river crossing
- 8th Street (Grey Road 5 east of 16th Avenue East) – Provides continuous route in east Owen Sound
- 20th Street (7th Avenue E to 20th Avenue E) – Provides a continuous route in east Owen Sound
- 7th Avenue East – Provides a north-south connection linking to the planned Recreational Centre

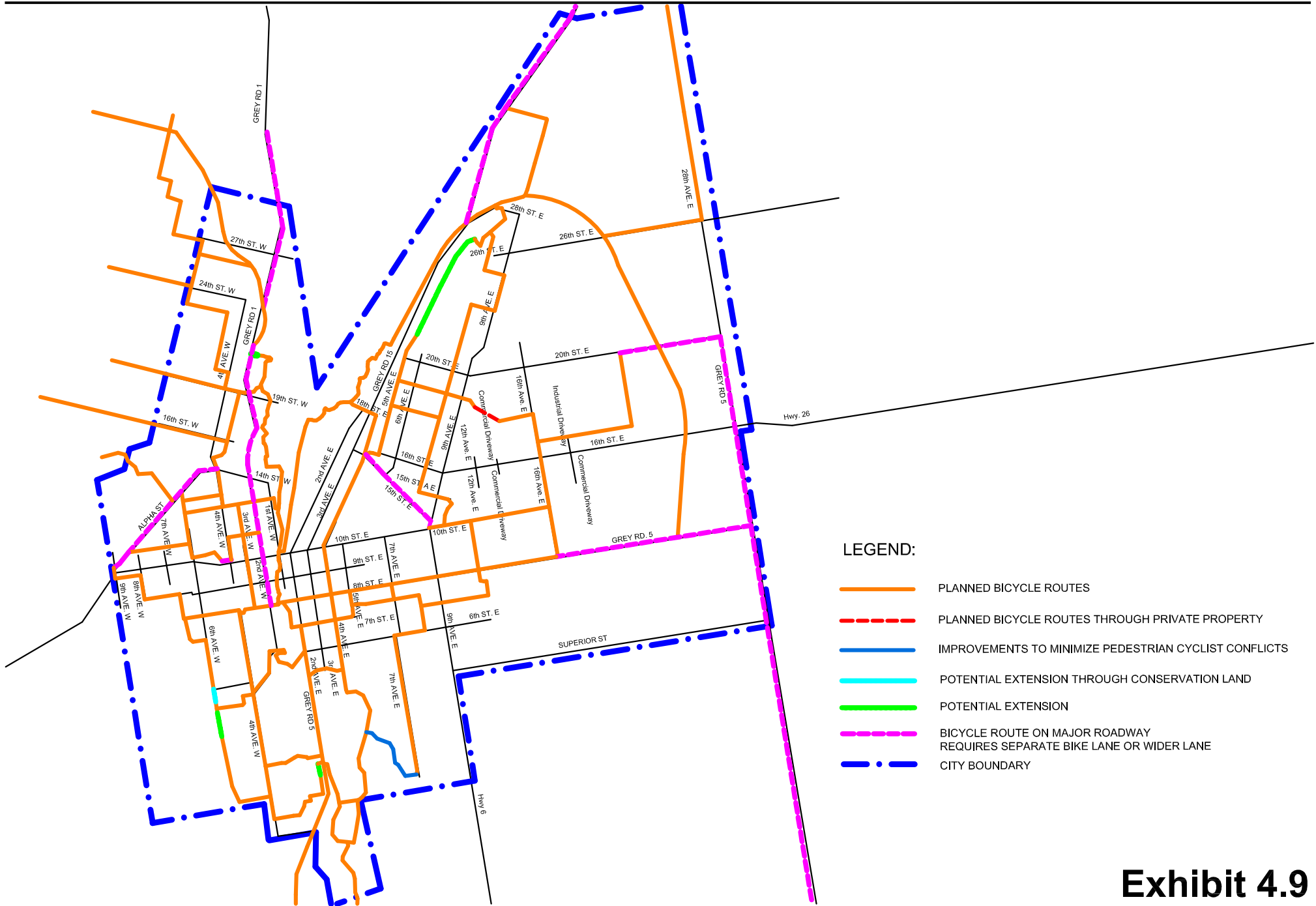
4.4.5 Park and Ride and Carpool Lots

There are currently no Park and Ride lots in the vicinity of Owen Sound.



- LEGEND:
- EXISTING WALKING ROUTES
 - POTENTIAL EXTENSION
 - CITY BOUNDARY

Exhibit 4.8 Owen Sound Planned Walking Network



LEGEND:

- PLANNED BICYCLE ROUTES
- - - PLANNED BICYCLE ROUTES THROUGH PRIVATE PROPERTY
- · - IMPROVEMENTS TO MINIMIZE PEDESTRIAN CYCLIST CONFLICTS
- POTENTIAL EXTENSION THROUGH CONSERVATION LAND
- POTENTIAL EXTENSION
- · - BICYCLE ROUTE ON MAJOR ROADWAY REQUIRES SEPARATE BIKE LANE OR WIDER LANE
- · · - CITY BOUNDARY

Exhibit 4.9 Owen Sound Proposed Cycling Network

Not to Scale

September 2010



4.5 Origin-Destination Survey

The origin-destination survey was conducted on key arterial routes in the City and for inbound vehicles only (with the exception of Grey Road 18. The primary intent of the origin-destination study was to determine the amount of provincial, regional, and local traffic that had origins or destinations to Owen Sound versus the amount of through traffic on City and County Roads. The locations of the survey stations are listed in **Table 4.8** below.

Table 4.8: OD Survey Locations

Survey Station	Street	Location	Date
1 Southbound	Grey Road 15	North of 28th St E	23-Oct-09
4 Westbound	Hwy 26 (16th St. E)	East of 16th Ave. E	23-Oct-09
5 Westbound	8th St. E	East of 9th Ave. E	23-Oct-09
7 Northbound	Hwy 6 & 10 (9th Ave. E)	South of 6 th St E	23-Oct-09
8 Northbound	Grey Road 5 (2nd Ave W)	South of 6 th St E	23-Oct-09
9 Eastbound	Hwy 6 & 21 (10th St W)	West of 8th Ave W	23-Oct-09
13 Southbound	Grey Road 1 (3rd Ave W)	North of 19 th St W	23-Oct-09
14 Eastbound	Grey Road 18	West of Highway 6 & 10	23-Oct-09
14 Westbound	Grey Road 18	East of Highway 6 & 10	23-Oct-09

In order to limit delays to the travelling public, the OD survey was conducted using a pre-paid mail back questionnaire method. In order to allow for the safety of the staff handing out the questionnaires, the station locations were set at existing signalized intersections located within the boundaries of the City and the questionnaires were handed out only during the red phase of the cycle. The only exception to this was at Station 1 where there was no traffic signal and the use of a flagman was used to stop vehicles. An origin-destination questionnaire was handed out to drivers by Pyramid Traffic Inc. on behalf of HDR | iTRANS and the City of Owen Sound during the afternoon of Friday October 23, 2009. A copy of the questionnaire used in this OD survey is shown in **Exhibit 4.10**.



About Your Trip!	City of Owen Sound Travel Survey	1NB
Please fill in the questionnaire, and drop it in the mail, fax, or scan and email. Your responses will make a difference towards improving the transportation network in the City of Owen Sound.		
1. When did you receive this survey?	Date: _____ Month/Day	Time: _____ Hour/Minute
2. What type of vehicle are you driving? (please check one)	<input type="checkbox"/> Passenger Car /Motor Cycle	<input type="checkbox"/> Single Unit Truck <input type="checkbox"/> Large Truck
3. Where did your trip begin?	City/Town _____	Prov./State _____ Postal Code/Zip _____
Major Intersection or other identifying landmark. _____		
4. Where is your destination?	City/Town _____	Prov./State _____ Postal Code/Zip _____
Major Intersection or other identifying landmark. _____		
5. How frequently do you make this trip? (please check one)	_____ times/day	_____ times/year <input type="checkbox"/> daily
	<input type="checkbox"/> weekly	<input type="checkbox"/> monthly <input type="checkbox"/> first time
6. What is the purpose of your trip? (please check one)	<input type="checkbox"/> work	<input type="checkbox"/> shopping <input type="checkbox"/> visiting someone
	<input type="checkbox"/> vacation	other (please provide detail) _____
7. Why did you choose this route?	<input type="checkbox"/> safe	<input type="checkbox"/> fast <input type="checkbox"/> convenient
	<input type="checkbox"/> scenic	<input type="checkbox"/> road condition <input type="checkbox"/> only choice
	<input type="checkbox"/> other	_____
THANK YOU FOR PARTICIPATING IN THIS SURVEY!		Contact Info: _____
All completed surveys received will be entered in a draw for \$500.00. So, please submit your completed survey, including Contact Info. by October 30, 2009 to ensure your chance to win.		_____

Exhibit 4.10: OD Survey Questionnaire

A total number of 4,650 questionnaires were handed out at the 9 stations. The number of questionnaires handed out at each station was based on 25 percent of the historic 2006 AADT traffic volumes at each location. This percentage of daily traffic was expected to provide a large enough sample to draw findings and conclusions from. The number of questionnaires handed out at each station is listed in **Table 4.9** below.

Table 4.9: OD Survey Questionnaire Handed Out by Location

Location	Number of Questionnaires	Percentage
#1 - Grey Road 15	200	4
#4 - 16th Street East	400	9
#5 - 8th Street East	200	4
#7 - 9th Avenue East	750	16
#8 - Grey Road 5 (2nd Ave W)	200	4
#9 - 10th Street West	1400	30
#13 - Grey Road 1 (3rd Ave W)	600	13
#14EB - Grey Road 18	450	10
#14WB - Grey Road 18	450	10
Total	4650	100



4.5.1 Results of Origin-Destination Survey

Out of the 4,650 questionnaires handed out, a total of 623 (13.4%) of questionnaires were returned. **Table 4.10** below shows the number of returned questionnaires by station location along with the percentages compared to the number of questionnaires handed out and the percentage of returned questionnaires.

Table 4.10: OD Survey Number of Returned Questionnaires

Location	Number of Returned Questionnaires	Percentage Returned	Percentage from Station Returned
#1 - Grey Road 15	42	7	21
#4 - 16th Street East	55	9	14
#5 - 8th Street East	19	3	10
#7 - 9th Avenue East	97	16	13
#8 - Grey Road 5 (2nd Ave W)	22	4	11
#9 - 10th Street West	234	38	17
#13 - Grey Road 1 (3rd Ave W)	87	14	15
#14EB - Grey Road 18	46	7	10
#14WB - Grey Road 18	21	3	5
Total	623	100	13.4

The general summary of the origin-destination survey is provided below and also included in **Appendix F1**.

4.5.1.1 Trip Origins

A list of all originating trips are listed in **Table 4.11** and shown graphically in **Exhibit 4.11**.



Table 4.11: OD Survey Origin Locations

Origin	#	%	Origin	#	%	Origin	#	%
Owen Sound	290	46.5	Markdale	4	0.6	Kimberley	1	0.2
Warton	32	5.1	Rockford	4	0.6	Kincardine	1	0.2
Shallow Lake	18	2.9	Walkerton	4	0.6	Listowel	1	0.2
Chatsworth	16	2.6	Burlington	3	0.5	Mar	1	0.2
Tara	15	2.4	Durham	3	0.5	Massie	1	0.2
Kemble	13	2.1	Keady	3	0.5	Mississauga	1	0.2
Sauble Beach	13	2.1	Kilsyth	3	0.5	Mooreburg	1	0.2
Meaford	11	1.8	Mount Forest	3	0.5	Neustadt	1	0.2
Port Elgin	11	1.8	Paisley	3	0.5	Niagara Falls	1	0.2
Annan	10	1.6	Thornbury	3	0.5	Northern Bruce Peninsula	1	0.2
Hepworth	10	1.6	Tiverton	3	0.5	Oliphant	1	0.2
Georgian Bluffs	9	1.4	Tobermory	3	0.5	Peterborough	1	0.2
Lions Head	9	1.4	Barrie	2	0.3	Priceville	1	0.2
Desboro	7	1.1	Berkley	2	0.3	Ready	1	0.2
Hanover	7	1.1	Hamilton	2	0.3	Ripley	1	0.2
Leith	7	1.1	Holland Center	2	0.3	Rural	1	0.2
Unidentified	7	1.1	Kitchener	2	0.3	Sarnia	1	0.2
Chesley	6	1.0	Springmount	2	0.3	Shelburne	1	0.2
Southampton	6	1.0	Teeswater	2	0.3	Sideroad 22	1	0.2
Toronto	6	1.0	Uxbridge	2	0.3	Stokes Bay	1	0.2
Williamsford	6	1.0	Big Bay	1	0.2	Sydenham Twp	1	0.2
Allenford	5	0.8	Bradford	1	0.2	Wasaga Beach	1	0.2
Brampton	5	0.8	Cargill	1	0.2	Windsor	1	0.2
Collingwood	5	0.8	Clarksburgh	1	0.2	Woodford	1	0.2
Guelph	5	0.8	East Linton	1	0.2			
Bogner	4	0.6	Gravenhurst	1	0.2	TOTAL	623	100.0
Flesherton	4	0.6	Kemptville	1	0.2			

The majority of trips are originating in the greater Owen Sound area which includes Grey and Bruce Counties. This includes 46.5 percent (290 of 623) of the returned questionnaires originating from the City of Owen Sound. The second highest origin area was the Town of Warton in Bruce County with 5.1 percent (or 32 out of 623). This finding indicates that almost half of the traffic on the major road network is localized traffic that originated in Owen Sound.

4.5.1.2 Trip Destinations

A list of the destinations are provided in **Table 4.12** and shown graphically in **Exhibit 4.12**.



Table 4.12: OD Survey Destination Locations

Destinations	#	%	Destinations	#	%
Owen Sound	554	88.9	Echville	1	0.2
Chatsworth	10	1.6	Fergus	1	0.2
Unidentified	7	1.1	Georgion Bluffs	1	0.2
Wiarion	5	0.8	Grey County	1	0.2
Meaford	4	0.6	Kemble	1	0.2
Rockford	4	0.6	North Bay	1	0.2
Big Bay	3	0.5	Oakville	1	0.2
Collingwood	3	0.5	Port Elgin	1	0.2
Leith	3	0.5	Renfrew	1	0.2
Annan	2	0.3	Sauble Beach	1	0.2
Brampton	2	0.3	Springmount	1	0.2
Burlington	2	0.3	Tara	1	0.2
Flesherton	2	0.3	Thornbury	1	0.2
Kilsyth	2	0.3	Toronto	1	0.2
Southampton	2	0.3	Walkerton	1	0.2
Berkeley	1	0.2	Waterloo	1	0.2
Durham	1	0.2	TOTAL	623	100.0

As shown in the above table, the majority of trips (88.9 percent) are destined to the City of Owen Sound reinforcing the fact that Owen Sound is a major attractor of trips.

4.5.1.3 Trip Destinations within Owen Sound

As shown by the destination results, the City of Owen Sound was the main destination for the majority of respondents in the survey. By analysing the destinations by individual station location, it is apparent that there are three main areas within the city that draw the most trips: the Downtown core; the 16th Street East commercial area; and the 8th Street East institutional area. This is illustrated in **Exhibit 4.13** through **Exhibit 4.15** which shows the percentage of trips and their approximate routing to their final destinations from the south, north-northwest, and east-northeast.

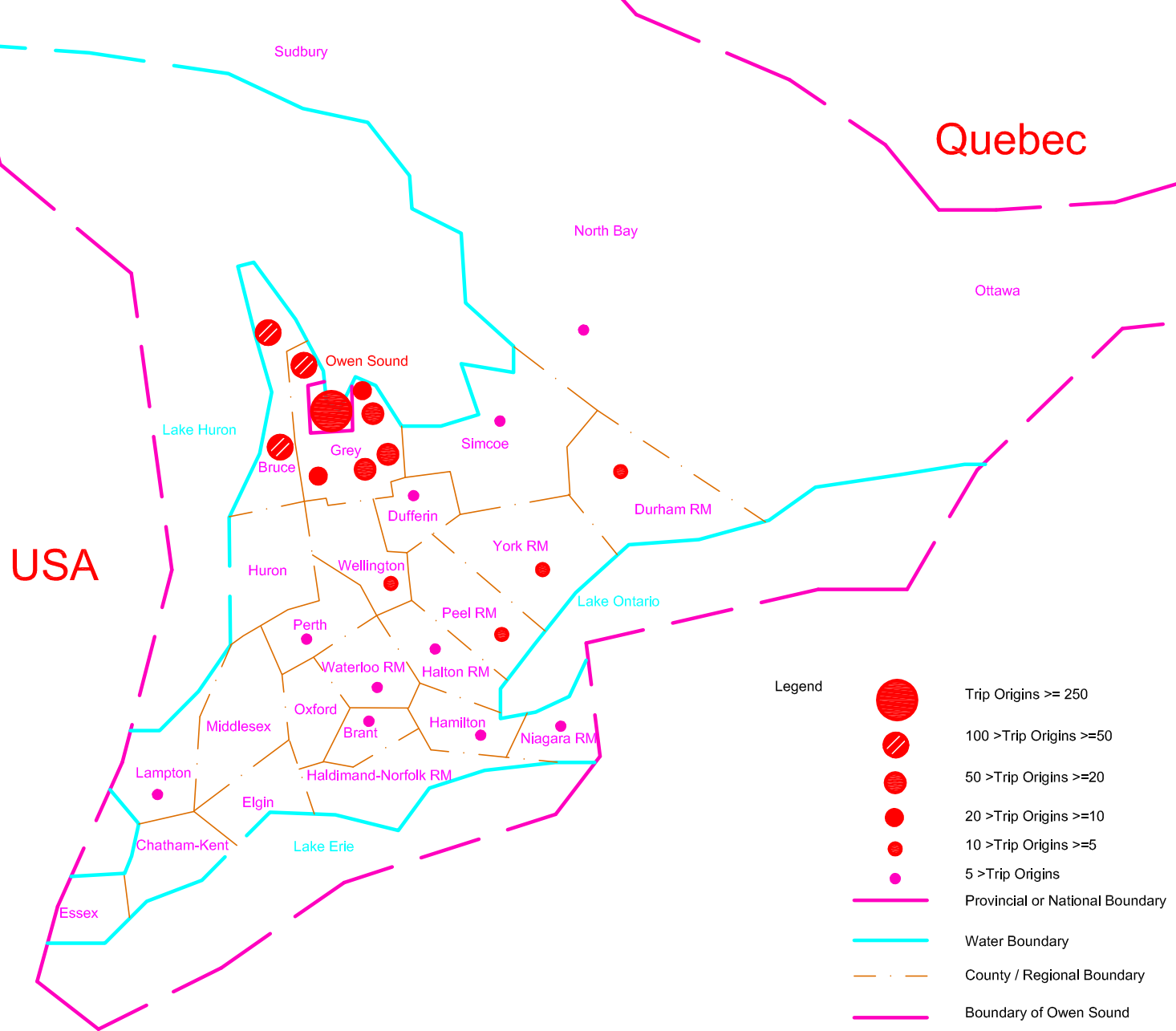
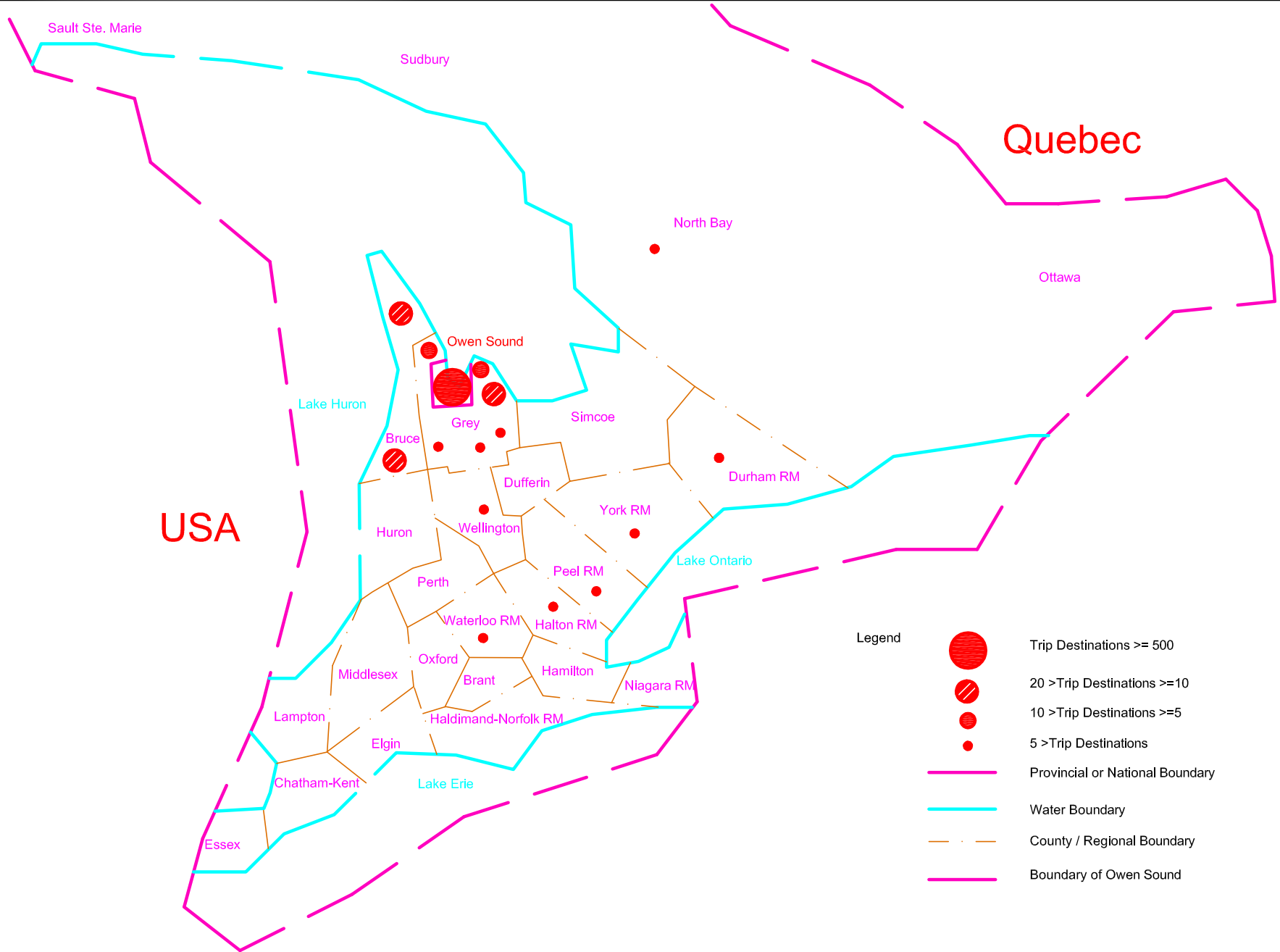


Exhibit 4.11 OD Survey - Origins



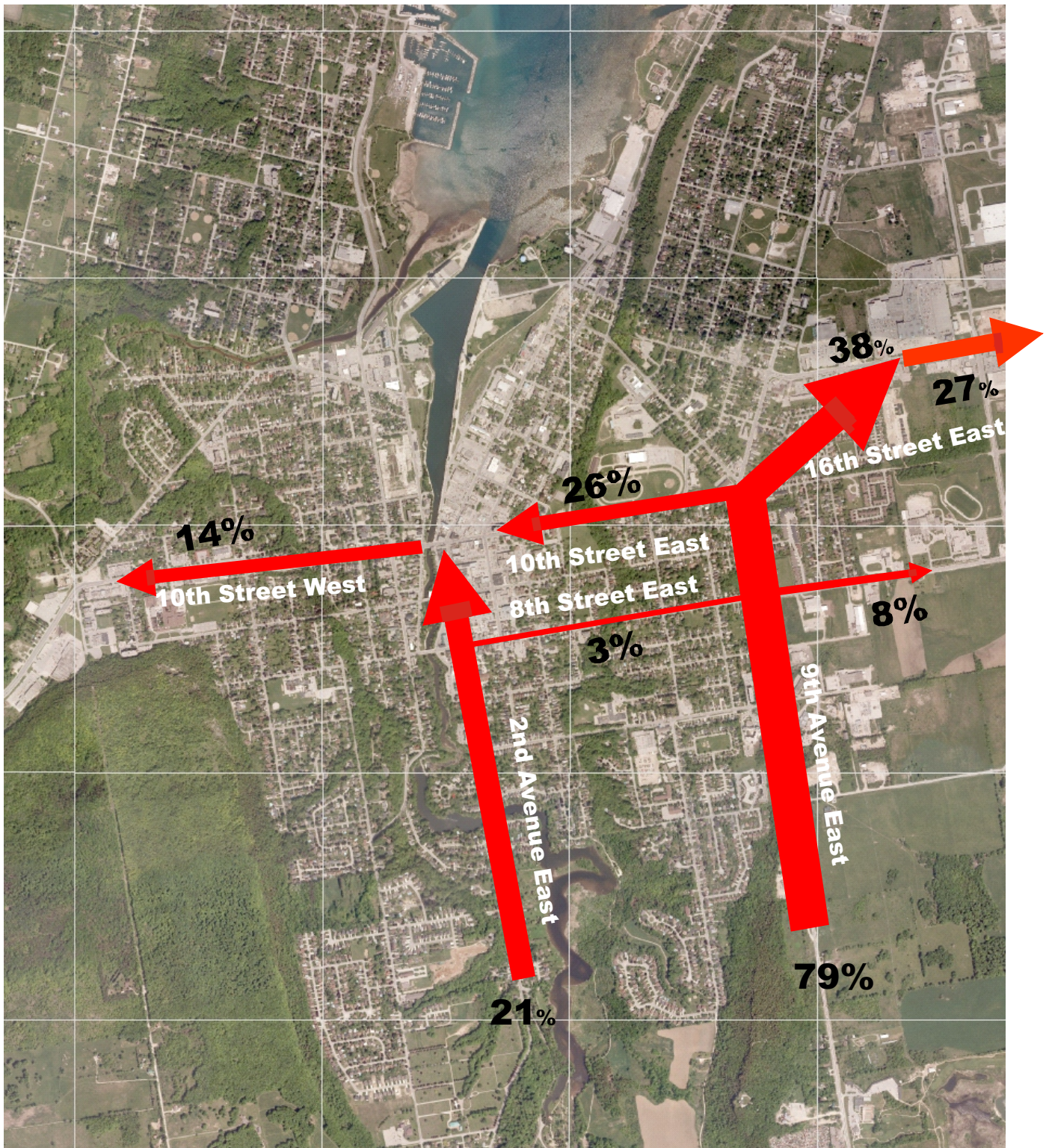


Exhibit 4.13

OD Summary from the South

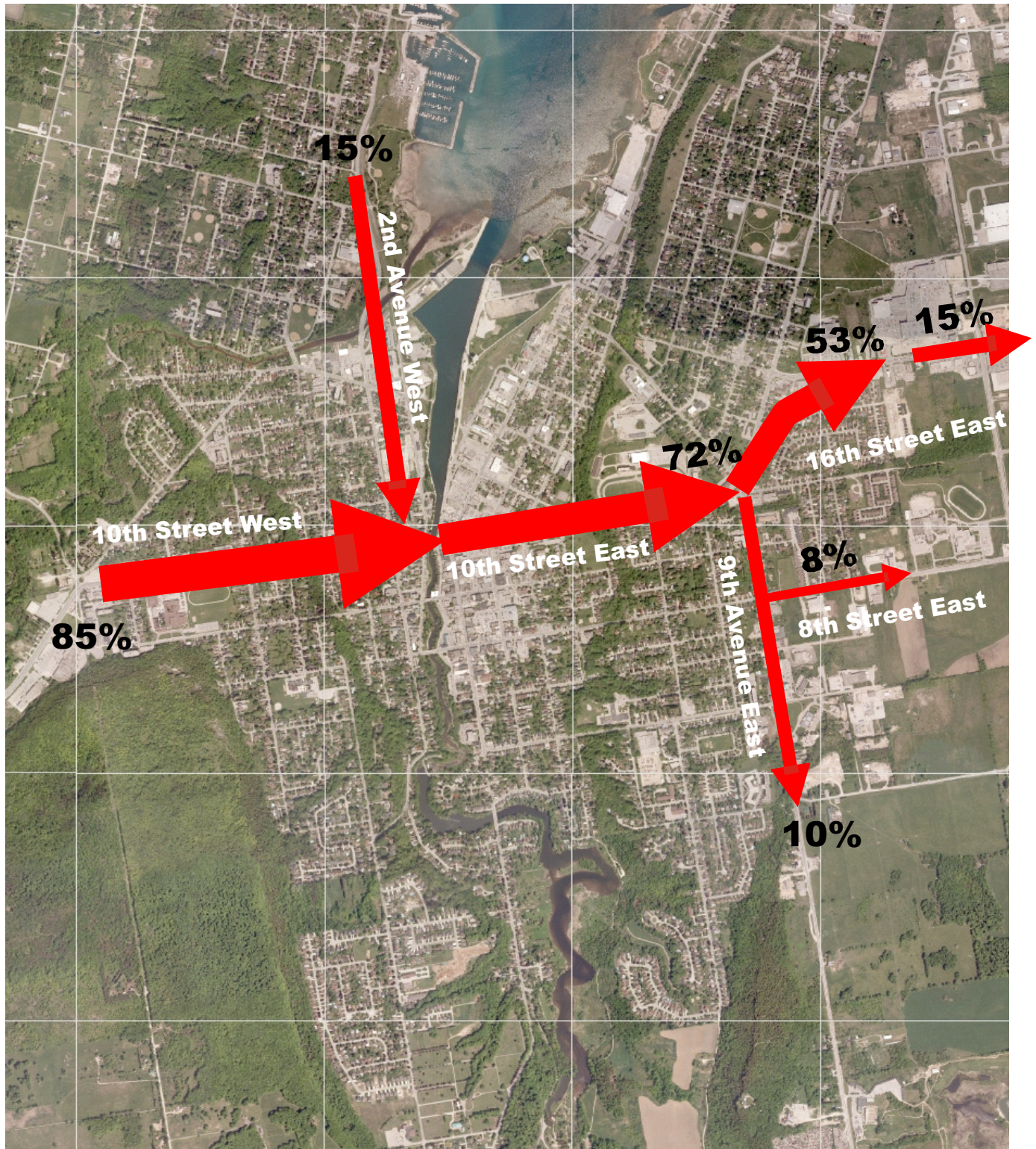


Exhibit 4.14

OD Summary from West-Northwest



Exhibit 4.15

OD Summary from East-Northeast



4.5.1.4 Trip Purpose

A question asked to the public as part of the mail back survey was what is the main purpose of their trip. Answers included: Work; Shopping; Visiting; Vacation; and Other. The results of this question are illustrated in **Exhibit 4.16** below.

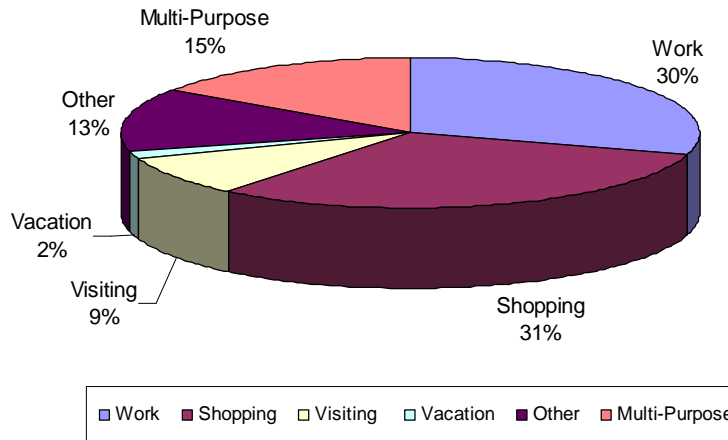


Exhibit 4.16: Trip Purpose Summary

As shown in the exhibit above, shopping and working were the most popular responses with approximately 31 and 30 percent respectively. This finding suggests that Owen Sound is a major attractor for both commerce and employment.

4.5.1.5 Trip Frequency

Another question asked was how frequent they made this trip. Choices on the mailback survey included: daily; weekly; monthly; and first time. The results from the returned questionnaires are illustrated in **Exhibit 4.17**.

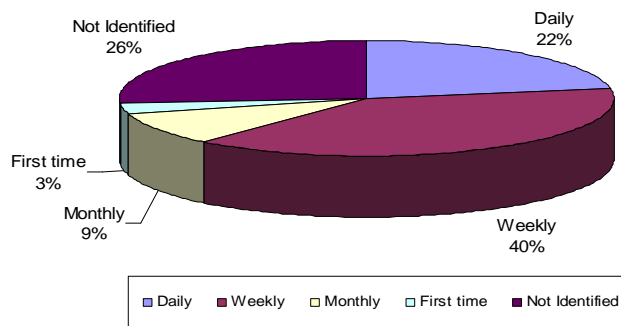


Exhibit 4.17: Trip Frequency Summary

As shown in the exhibit above, the majority of vehicle trips are weekly and daily trips. This tends to indicate that the majority of drivers do this trip fairly frequently and are confident in their knowledge of route selection and direction of travel through Owen Sound.



4.5.1.6 Route Selection

Exhibit 4.18 illustrates the overall response of why respondents chose the route they took.

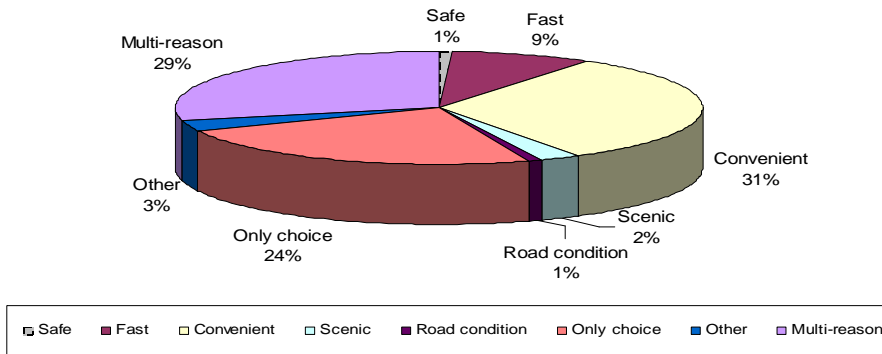


Exhibit 4.18: Route Selection Summary

Route convenience at 31% was the primary reason they chose a specific route. 29% of the respondents chose “multiple-reason”, and 24% of the respondents chose “only choice”.

4.5.1.7 Vehicle Type

Exhibit 4.19 illustrates the vehicle type of the respondents.

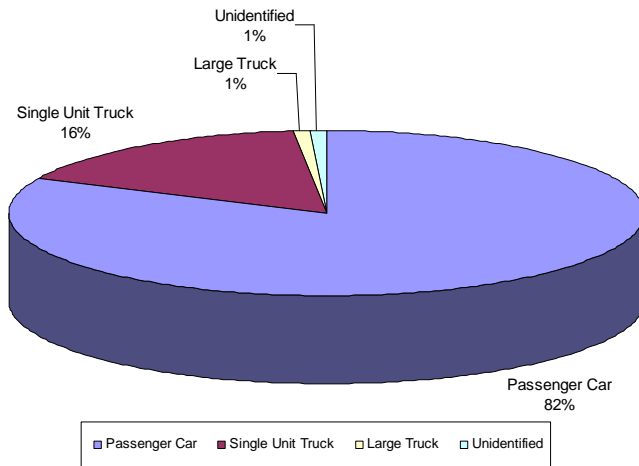


Exhibit 4.19: Vehicle Type Summary

Passenger car was the primary mode of travel for respondents with approximately 82 percent of all travel occupancy via automobile. Large trucks only represented 1% of the respondents.

4.5.2 O-D Survey Summary

Owen Sound is clearly a regional centre within the County of Grey where residents from neighbouring communities in Grey and Bruce Counties choose to do their daily / weekly activity. This is confirmed by the majority of daily/weekly trip frequency, trip purpose, and vehicle type responses received from the survey.



4.6 **Existing Network Performance**

4.6.1 **Level-of-Service Considerations**

The concept of level-of-service is a measure describing operational conditions of the roadway perceived by the user. A common method of representing level-of-service has traditionally been a *qualitative* letter grading system corresponding to six levels of service. The letter designations are from "A" to "F", with "A" representing the best operating conditions and "F" the worst. These levels are measured by *quantifiable* parameters that describe operating quality, such as travel delay, average speed or reserve capacity.

Level-of-service at intersections is measured in terms of the amount of capacity is utilized and conveyed as decimal value referred to as a volume-to-capacity ratio (v/c ratio). Level-of-service is also measured based on average vehicle delay at each intersection. The delay is related to letter designations from LOS "A" (less than 25 seconds per intersection) to "F" (greater than 80 seconds). Most jurisdictions in Ontario strive to maintain level-of-service 'D' for a typical commuter day.

Congested traffic conditions directly increase fuel consumption and vehicle emissions. Level-of-service affects average vehicle speed and number of stops. There is a direct interrelationship between vehicle speed and air quality. At least half of transportation based pollution occurs as a result of the vehicle trip. Operations at a lower level-of-service, example: level of service 'E' rather than 'D' would increase vehicle emissions on affected facilities in the order of 25%.

Given the environmental and transportation objectives of the Town of Owen Sound as defined in the strategic plan and Official Plan, current and future conditions were assessed relative to a level-of-service 'D'.

4.6.2 **Data Sources**

Land use data for this study were obtained from the City of Owen Sound Planning Department. Traffic data were obtained from the Pyramid Traffic Inc., City of Owen Sound, Grey County, and the Ministry of Transportation Ontario (MTO). The details of the data sources are provided in **Appendix F2**.

An assessment of existing and future traffic conditions was undertaken as part of the Transportation Master Plan. The initial step in the traffic assessment is to establish the existing capacity and operating characteristics of the road network. The assessment of existing conditions is used as a benchmark to compare with future conditions, as well as to determine the extent of improvements that are required which affects the development and selection of alternatives. The two measures of effectiveness used for the analysis include link capacity (vehicles per lane/per hour) and intersection capacity (volume / capacity ratio). Both are reported using a level of service indicator.



4.6.3 2009 Road Network Capacity

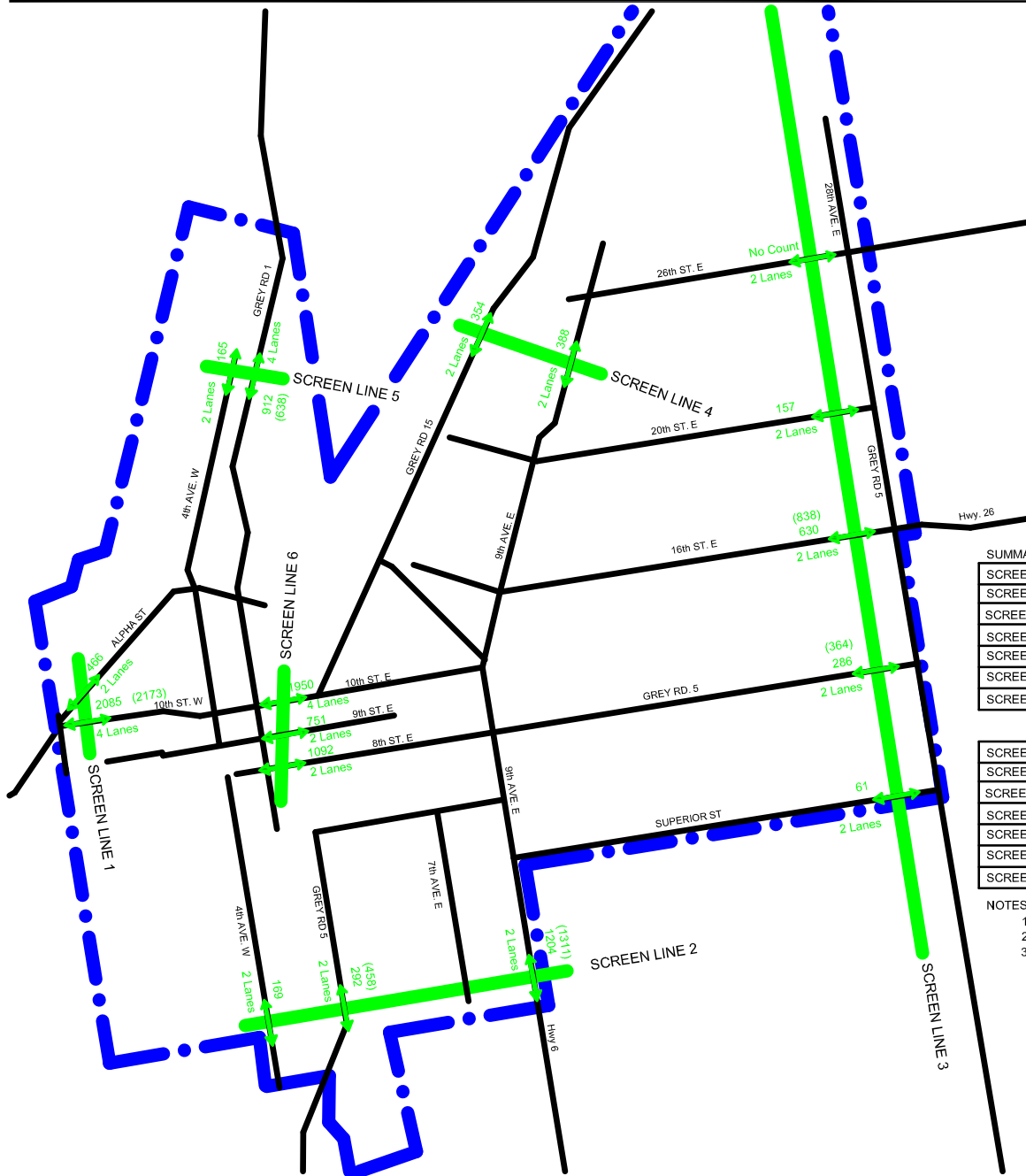
For planning purposes, it is generally accepted that screenline volume to capacity (v/c) ratios of 0.85 to 0.90 signify stop-and-go conditions, long intersection queuing and delays, and indicate capacity deficiencies on one or more roadways included in a screenline. **Exhibit 4.20** illustrates volume to capacity ratios calculated for the existing travel conditions during the PM peak period for select screenlines situated around the City of Owen Sound.

The colour of each screenline shows the level of congestion and has been defined as follows:

- Green coloured arrows - indicate that roads crossing the screenline and the intersection have spare capacity. Roads are operating at a v/c ratio of less than 0.75,
- Yellow coloured arrows - indicate that roads crossing the screenline are at capacity. These roads are operating at a v/c ratio of 0.79 to 0.90 meaning the roads that comprise the screenline experience some congestion; and,
- Red coloured arrows - indicate that roads crossing the screenline are over capacity and severely congested. In such case a number of roads would operate at a v/c ratio of 0.90 or more signalling severe capacity deficiency.

Screenlines capture traffic flows on east-west routes such as 10th Street, 9th Street, and 8th Street across the Sydenham River, 10th Street West and Alpha Street in the west end, and Superior Street, 8th Street East, 16th Street East, 20th Street East, and 26th Street East in the east end. As shown in **Exhibit 4.20** the east-west arterials in the west and east sides of the city have sufficient residual capacity available. The east-west crossings of the Sydenham River also have spare capacity available during the PM peak hour even though 10th Street is congested in this section of the City which indicates that roadways such as 8th Street East/West and 9th Street East/West have the residual capacity. The north-south screenlines (Grey County Road 1 and 4th Avenue West in the Northwest, Grey County Road 15 and 9th Avenue East in the north east, and Grey County Road 5 and 9th Avenue East in the south) are showing that there is sufficient capacity available during the PM peak hour on all routes.

In summary, the screenline analysis for 2009 existing conditions shows that for the majority of the transportation network there is sufficient capacity available. Additional capacity along 10th Street can be afforded if motorists are encouraged to utilize other east-west routes parallel to 10th Street such as 9th Street and 8th Street.



SUMMARY 2006 Traffic Count

SCREEN LINE	NUMBER OF LANES	TOTAL VOLUMES	TOTAL CAPACITIES	% USED CAPACITY	% RESERVED CAPACITY
SCREEN LINE 1	6	2551	5400	47	53
SCREEN LINE 2	6	1665	5400	31	69
SCREEN LINE 3	10	1234	9000	14	86
SCREEN LINE 4	4	741	3600	21	79
SCREEN LINE 5	6	1077	5400	20	80
SCREEN LINE 6	8	3793	7200	53	47

2009 Traffic Count (If no 2009 Traffic Counts Are Available, 2006 Volumes Were Used)

SCREEN LINE	NUMBER OF LANES	TOTAL VOLUMES	TOTAL CAPACITIES	% USED CAPACITY	% RESERVE CAPACITY
SCREEN LINE 1	6	2639	5400	49	51
SCREEN LINE 2	6	1938	5400	36	64
SCREEN LINE 3	10	1520	9000	17	83
SCREEN LINE 4	4	741	3600	21	79
SCREEN LINE 5	6	803	5400	15	85
SCREEN LINE 6	8	3793	7200	53	47

- NOTES:**
- 1,900 VEHICLES PER HOUR PER LANE CAPACITY WERE ASSUMED
 - 10% OF DAILY VOLUMES WERE ASSUMED FOR PM PEAK HOUR IF NO PM PEAK HOUR VOLUMES AVAILABLE
 - NO TRAFFIC COUNT ON 26th STREET EAST, 1000 VEHICLES PER DAY WERE ASSUMED

LEGEND:

- USED CAPACITY 0% - 75% (6297 - 2006 Traffic Count (v/h), (6297) - 2009 Traffic Count (v/h))
- USED CAPACITY 76% - 89%
- USED CAPACITY >90%

Existing Traffic PM Peak Hour Screen Line Capacities

Exhibit 4.20



4.6.4 2009 Intersection Capacity

Exhibit 4.21 illustrates the level of service calculated for the existing traffic conditions during the PM peak hour for select signalized and unsignalized intersections situated throughout the study area.

The colour of each intersection shows the current level of service and has been defined as follows:

- Green coloured circle – indicate that the intersection is operating with a level of service ‘A’ or ‘B’ and that intersection and individual turning movements have spare capacity,
- Yellow coloured circle – indicate that the intersection is operating with a level of service ‘C’ or ‘D’ and that the intersection and individual turning movements are experiencing some congestion. Some individual turning movement may experience level of service ‘F’ with volume to capacity ratios greater than 0.90,
- Red coloured circle – indicate that the intersection is operating with a level of service ‘E’ or ‘F’ and that the intersection and/or individual turning movements are approaching or over capacity signalling severe capacity deficiency. Some individual turning movements may also experience level of service ‘F’ with volume to capacity ratios greater than 0.90.

As shown in **Exhibit 4.21**, the majority of key intersections (arterial to arterial or collector to arterial) operate with an overall level of service ‘D’ or better during the PM peak hour. Some signalized intersection along the arterial connecting links (i.e. the 10th Street corridor downtown, 9th Avenue East, and 16th Street East) show that they operate with an overall level of service in excess of ‘D’ indicating that the congestion on these links is caused by the intersections.

4.6.5 Signal Warrant Analyses

As part of the scope of this study the City requested that a number of unsignalized intersections be assessed to determine if traffic signals at these intersections would be justified. Traffic signal justification analysis was based on the latest *OTM Book 12 Ministry of Transportation Ontario* (OTM) methodology. The analysis was undertaken at the following unsignalized intersections:

- 3rd Avenue East at 15th Street East (St. Mary’s Hill)
- 16th Avenue East at 20th Street East
- 9th Avenue East at 20th Street East
- 4th Avenue East at 8th Street East
- 9th Avenue East at 15th Street East ‘A’
- 6th Avenue East at 16th Street East

There are six justifications for traffic signals in the *Book 12*. The first four were applied, which are based on turning movement counts.

Signals were not justified for any intersection under the first three justifications, which are based on eight hour turning movement counts.



LEGEND:

- LOS A & B
- LOS C & D
- LOS E & F
- ⊥ LOS F or v/c ratio greater than 0.9 for Individual Turning Movement

Exhibit 4.21 Existing PM Peak Hour Intersection Level of Service



The intersections of 3rd Avenue East at 15th Street East (St. Mary’s Hill) and 6th Avenue East at 16th Street East warranted traffic signals based on the fourth justification, which is a four hour turning movement count. The purpose of the four hour count justification is for areas with commuter-dominated roadways, commercial areas, or manufacturing, office, or industrial areas. The details of existing traffic signal warrant analyses are summarized in **Appendix F3**.

4.6.6 Assess the Merit of Opposing North-South Left Turn Lanes on 9th Avenue East and 6th Street East

As part of the scope of this study the City requested that the merit of installing opposing north-south left turn lane at the 9th Avenue East and 6th Street East intersection be assessed (**Exhibit 4.22**). Based on site investigations, the 9th Avenue at 6th Street East intersections lane configurations are as follows:

- On the north approach, there are two approach lanes with one shared southbound through-right lane and one shared southbound through-left lane and two receiving lanes.
- On the south approach, there are three approach lanes with one exclusive northbound left turn lane, one exclusive northbound through lane, one exclusive northbound right turn lane and two receiving lanes.

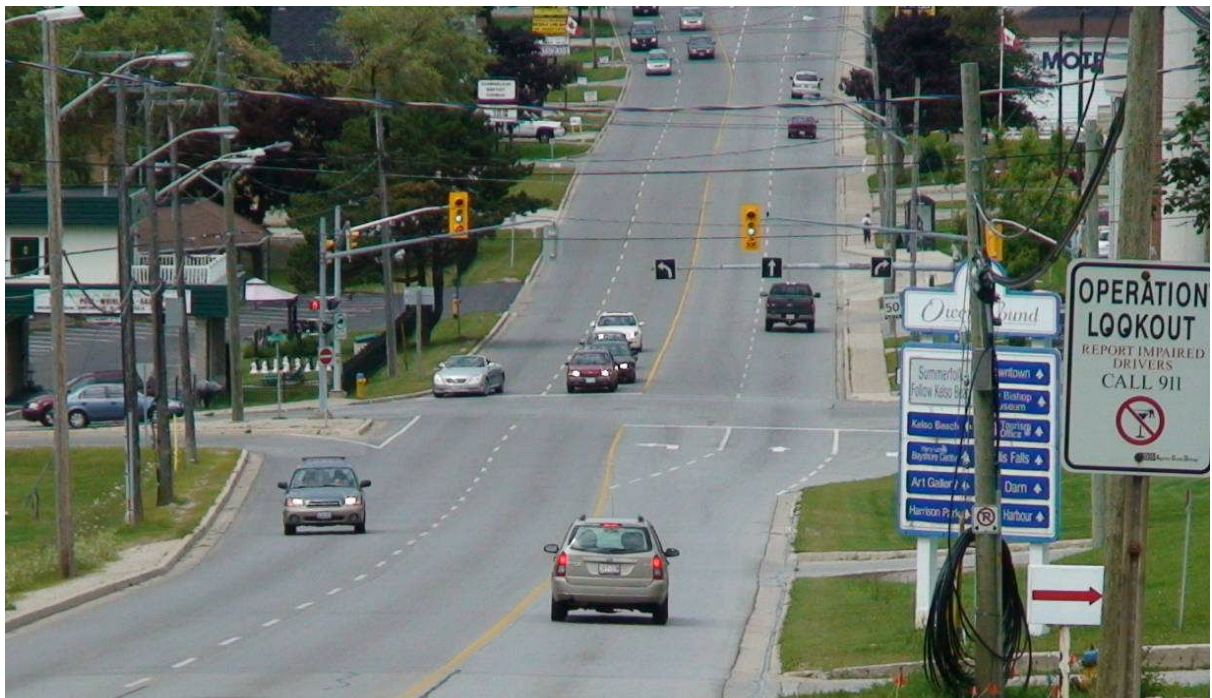


Exhibit 4.22: Intersection of 9th Avenue East at 6th Street East from the South

The second northbound receiving lane could be repainted within the existing pavement surface to accommodate a southbound exclusive left turn lane and would have the following potential benefits:

- Increase southbound approach capacity.



- Improve safety

As there is only one northbound through approach lane and two receiving lanes, the exclusive southbound left turn lane will not impact the northbound through movement capacity. However, consideration to eastbound left turning vehicles from 6th Street East would have to be taken into account through signing or pavement markings as well, so that vehicles accustomed to making this manoeuvre are directed to the northbound receiving lane and not the southbound left turn lane.

Having the northbound and southbound opposing left turn lanes will improve left turn traffic sight lines and also reduce left turn traverse distance which result in the risk for left turn collisions being reduced.

The traffic operations for the weekday PM peak hour for the intersection of 9th Avenue East at 6th Street East under existing conditions and with the southbound left turn lane being implemented are summarized in **Table 4.13**.

Table 4.13: 9th Avenue East at 6th Street East Operations Comparison

Intersection & Movement	Weekday PM Peak Hour (Existing)		Weekday PM Peak Hour (With Southbound Left Turn Lane)	
	LOS	v / c	LOS	v / c
9th Avenue East at 6th Street East				
Overall	C		C	
Eastbound left and through	E	0.65	E	0.65
Eastbound right	C	0.29	C	0.29
Westbound left, through, and right	C	0.25	C	0.25
Northbound left	A	0.20	A	0.20
Northbound through	A	0.19	A	0.19
Northbound right	A	0.02	A	0.02
Southbound left, through, and right	B	0.35	--	--
Southbound left	--	--	B	0.06
Southbound through, and right	--	--	B	0.31

There is no change in the overall intersection operations during the weekday PM peak hour with the addition of the exclusive southbound left turn lane. The exclusive southbound left turn lane results in a small decrease in the volume to capacity ratio for the shared southbound through-right turn lane. There are no changes to the eastbound, westbound, or northbound turning movement level of service and volume to capacity ratios. Further improvements to intersection operations could be achieved by optimizing the signal timing plans for this intersection (which is outlined in Section 4.6.2 of this report).

Based on the Synchro analysis, the existing southbound queue is reported at 32.4m for the 50th percentile queue reach and 61.0m for the 95th percentile queue reach. With the addition of an exclusive southbound left turn lane, the southbound left turn will have a 50th percentile queue reach of 10.6m and a 95th percentile queue reach of 28.0m. The southbound through-



right lanes will have a 50th percentile queue reach of 3.4m and a 95th percentile queue reach of 37.6m.

The addition of an exclusive southbound left turn lane would not adversely effect the overall intersection operations of 9th Avenue East and 6th Street East. Given the operational benefits it is recommended that an exclusive southbound left turn lane with a storage length of 30m be provided.

4.6.7 Assess the Merit of Converting the Northbound Through - Right Lane to Exclusive Right Turn Lane on 9th Avenue East at 8th Street East

As part of the scope of this study the City requested that the merit of converting the northbound through / right turn lane to an exclusive right turn lane on 9th Avenue East at 8th Street East be assessed. Based on site investigations, the intersection of 9th Avenue East at 8th Street East lane configurations are as follows:

- On the north approach, there are three approach lanes with one exclusive southbound left turn lane, one exclusive southbound through lane, one shared southbound through-right lane and two receiving lanes.
- On the south approach, there are three approach lanes with one exclusive northbound left turn lane, one exclusive northbound through lane, one shared northbound through-right lane and two receiving lanes.

The merit of modifying the northbound curb lane from a shared through-right lane to an exclusive northbound right turn lane depends on the northbound approach traffic volumes. If the northbound traffic volumes are high – especially the northbound right turn traffic volumes – then the exclusive right turn lane is beneficial. Otherwise, the exclusive right turn lane is not required. **Exhibit 4.23** shows the existing northbound lanes at the intersection.



Exhibit 4.23: Intersection of 9th Avenue East at 8th Street East from the South

Based on the turning movement counts collected at the intersection of 9th Avenue East at 8th Street East during the weekday AM, mid-day, and PM peak periods, the intersection has been assessed with the existing lane configuration, as summarized in **Table 4.14**, and with the proposed northbound left turn lane, as summarized in **Table 4.15**.

Table 4.14: 9th Avenue East at 8th Street East Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
9th Avenue East at 8th Street East						
Overall	D		C		D	
Eastbound left	B	0.15	C	0.21	C	0.35
Eastbound through and right	E	0.95	D	0.78	D	0.67
Westbound left	D	0.77	E	0.90	F	1.02
Westbound through and right	C	0.65	D	0.65	D	0.83
Northbound left	B	0.08	B	0.08	B	0.08
Northbound through and right	C	0.68	B	0.38	C	0.50
Southbound left	C	0.69	A	0.25	B	0.30
Southbound through and right	B	0.25	B	0.23	B	0.31



Table 4.15: 9th Avenue East at 8th Street East Operations with Northbound Right Turn Lane

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
9th Avenue East at 8th Street East						
Overall	C		C		D	
Eastbound left	B	0.15	C	0.21	C	0.35
Eastbound through and right	E	0.95	D	0.78	D	0.67
Westbound left	D	0.77	E	0.90	F	1.02
Westbound through and right	C	0.65	D	0.65	D	0.83
Northbound left	B	0.08	B	0.08	B	0.08
Northbound through	D	0.74	C	0.43	C	0.61
Northbound right	A	0.50	A	0.31	A	0.32
Southbound left	B	0.59	A	0.22	B	0.28
Southbound through and right	B	0.25	B	0.23	B	0.31

With the inclusion of an exclusive northbound right turn lane, the overall intersection operations will improve to a level of service ‘C’ from a level of service ‘D’ during the weekday AM peak hour. There are no changes to the overall intersection operations during the weekday mid-peak and PM peak hours. The re-designation of the northbound curb side lane from a shared through-right movement to an exclusive right turn movement will reduce the northbound through capacity resulting in a higher volume to capacity ratio for the northbound through movement during all weekday peak periods. The southbound left turn movement results show a lower volume to capacity ratio for all peak periods as well. Volumes to capacity ratios at all remaining turning movements are unchanged.

It is recommended that a northbound right turn lane be provided as it will enhance the overall intersection operation. Optimizing the signal timing plans for this intersection will further improve operations and is reported in more detail in **Section 4.7.2**.

4.7 Signal Timing and Level of Service Issues

In the spirit of creating a sustainable transportation master plan an analyses of three key arterial road sections were assessed in detail to determine if greater efficiencies could be achieved making use of the existing infrastructure. The goal of this section is to review the signal timing and level of service at intersections along three main corridors in the City of Owen Sound. The intent of the review is to identify a number of improvements to the signal timing plans at each signalized intersection along each of the respective corridors to optimize the signal timing plans and facilitate the movement of through traffic by reducing the overall delay to motorists. The three corridors are: 10th Street between 3rd Avenue West and 4th Avenue East, 9th Avenue East between 6th Street East and 16th Street East, and 16th Street East from 9th Avenue East to 18th Street East. These three corridors in effect constitute the prime corridor for localized and through traffic in the City of Owen Sound.



4.7.1 10th Street Corridor

The existing signal timing plans along the 10th Street corridor have a cycle length of 120 seconds and are coordinated. The Synchro analyses show that during the PM peak hour, there are no through bands, and during the AM peak hour, only the eastbound traffic has a through band of 37 seconds. The existing traffic operations on the 10th Street Corridor using the current signal timing plans are summarized in **Table 4.16**.

Table 4.16: 10th Street Corridor Existing Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
10th Street West at 3rd Avenue West						
Overall	B		A		B	
Eastbound left, through, and right	A	0.34	A	0.31	A	0.34
Westbound left, through, and right	A	0.23	A	0.31	A	0.37
Northbound left, through, and right	E	0.57	E	0.50	E	0.63
Southbound left, through, and right	D	0.48	D	0.26	D	0.29
10th Street West at 2nd Avenue West						
Overall	C		B		C	
Eastbound left, through, and right	C	0.38	A	0.38	A	0.34
Westbound left, through, and right	B	0.30	A	0.42	A	0.50
Northbound left	C	0.24	D	0.43	D	0.57
Northbound through and right	D	0.32	D	0.60	E	0.78
Southbound left	C	0.38	D	0.39	D	0.58
Southbound through and right	E	0.78	E	0.73	E	0.72
10th Street West at 1st Avenue West						
Overall	C		B		B	
Eastbound left, through, and right	A	0.37	A	0.34	A	0.33
Westbound left and through	B	0.23	A	0.31	B	0.38
Westbound right	A	0.21	A	0.33	A	0.49
Northbound left	D	0.11	D	0.15	D	0.13
Northbound through	E	0.46	E	0.57	E	0.65
Northbound right	B	0.16	C	0.24	C	0.20
Southbound left	F	1.01	F	0.92	E	0.83
Southbound through and right	C	0.21	C	0.15	C	0.17
10th Street West at 2nd Avenue East						
Overall	C		D		D	
Eastbound left, through, and right	B	0.50	C	0.48	B	0.55
Westbound left, through, and right	D	0.71	D	0.77	E	0.80
Northbound left	D	0.24	E	0.48	D	0.39
Northbound through and right	E	0.66	E	0.70	E	0.71
Southbound left	D	0.11	D	0.14	D	0.29
Southbound through	D	0.21	D	0.50	D	0.45
Southbound right	B	0.43	B	0.51	B	0.67
10th Street West at 3rd Avenue East						



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Overall	B		B		C	
Eastbound left, through, and right	A	0.38	A	0.42	B	0.44
Westbound left, through, and right	A	0.19	B	0.26	B	0.31
Northbound left	D	0.20	C	0.35	C	0.32
Northbound through and right	D	0.51	D	0.52	D	0.57
Southbound left	E	0.64	E	0.71	E	0.73
Southbound through and right	B	0.29	B	0.30	B	0.33
10th Street West at 4th Avenue East						
Overall	A		A		B	
Eastbound left, through, and right	A	0.23	C	0.26	A	0.28
Westbound left, through, and right	A	0.19	D	0.20	A	0.26
Northbound left	D	0.07	B	0.06	D	0.07
Northbound through and right	D	0.39	B	0.56	D	0.65
Southbound left	D	0.09	A	0.19	E	0.33
Southbound through and right	D	0.32	B	0.34	D	0.46

To improve traffic operations, a set of updated traffic signal timing plans were created. The updated signal timing plans have a cycle length of 80 seconds for all peak periods and are coordinated. The updated signal timing details are provided in **Appendix F4**.

The existing 10th Street corridor operations with the proposed updated signal timing plans are summarized in **Table 4.17**. It is evident comparing **Table 4.16** and **Table 4.17** that the operations for all intersections are improved.

Table 4.17: 10th Street Corridor Updated Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
10th Street West at 3rd Avenue West						
Overall	A		A		A	
Eastbound left, through, and right	A	0.35	A	0.34	A	0.35
Westbound left, through, and right	A	0.24	A	0.34	A	0.39
Northbound left, through, and right	D	0.45	C	0.37	D	0.51
Southbound left, through, and right	C	0.39	C	0.20	C	0.24
10th Street West at 2nd Avenue West						
Overall	B		B		B	
Eastbound left, through, and right	B	0.44	A	0.44	A	0.41
Westbound left, through, and right	A	0.35	A	0.48	A	0.60
Northbound left	B	0.18	C	0.33	C	0.44
Northbound through and right	C	0.31	C	0.51	D	0.69
Southbound left	B	0.38	C	0.33	C	0.44
Southbound through and right	D	0.71	D	0.62	D	0.64
10th Street West at 1st Avenue West						



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Overall	B		B		B	
Eastbound left, through, and right	A	0.43	A	0.39	A	0.39
Westbound left and through	A	0.27	A	0.36	A	0.45
Westbound right	A	0.23	A	0.35	A	0.50
Northbound left	C	0.08	C	0.11	C	0.10
Northbound through	D	0.34	D	0.44	D	0.53
Northbound right	B	0.12	B	0.18	B	0.16
Southbound left	D	0.84	D	0.76	C	0.62
Southbound through and right	B	0.16	B	0.13	B	0.14
10th Street West at 2nd Avenue East						
Overall	C		C		C	
Eastbound left, through, and right	B	0.61	B	0.58	C	0.64
Westbound left, through, and right	C	0.63	C	0.75	D	0.85
Northbound left	C	0.20	C	0.34	C	0.30
Northbound through and right	D	0.54	C	0.58	C	0.59
Southbound left	C	0.07	C	0.09	C	0.18
Southbound through	C	0.18	C	0.43	C	0.39
Southbound right	A	0.38	A	0.46	A	0.63
10th Street West at 3rd Avenue East						
Overall	A		B		B	
Eastbound left, through, and right	A	0.44	A	0.46	A	0.49
Westbound left, through, and right	A	0.22	A	0.29	A	0.34
Northbound left	C	0.16	C	0.35	B	0.30
Northbound through and right	C	0.42	C	0.52	C	0.56
Southbound left	D	0.52	D	0.60	D	0.62
Southbound through and right	A	0.25	A	0.26	A	0.29
10th Street West at 4th Avenue East						
Overall	A		A		A	
Eastbound left, through, and right	A	0.2425	A	0.27	A	0.31
Westbound left, through, and right	A	0.21	A	0.21	A	0.29
Northbound left	C	0.05	C	0.05	C	0.06
Northbound through and right	C	0.28	C	0.42	B	0.50
Southbound left	C	0.06	C	0.14	C	0.22
Southbound through and right	C	0.23	C	0.26	C	0.37

4.7.2 9th Avenue Corridor

The existing signal timing plans on the 9th Avenue corridor have a cycle length of 100 seconds and are coordinated. The Synchro analyses show that there are almost no through bands during the peak periods. The existing traffic operations on 9th Avenue corridor under the existing signal timing plans are summarized in **Table 4.18**.



Table 4.18: 9th Avenue Corridor Existing Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
9th Avenue East at 6th Street East						
Overall	B		B		B	
Eastbound left and through	D	0.56	D	0.57	D	0.65
Eastbound right	B	0.34	A	0.34	A	0.29
Westbound left, through, and right	C	0.33	C	0.24	C	0.25
Northbound left	A	0.16	A	0.20	A	0.20
Northbound through	A	0.19	A	0.13	A	0.19
Northbound right	A	0.03	A	0.02	A	0.02
Southbound left, through, and right	B	0.26	B	0.28	B	0.35
9th Avenue East at 8th Street East						
Overall	D		C		D	
Eastbound left	B	0.16	C	0.21	C	0.35
Eastbound through and right	E	0.95	D	0.78	D	0.67
Westbound left	D	0.77	E	0.90	F	1.02
Westbound through and right	C	0.66	D	0.65	D	0.83
Northbound left	B	0.08	B	0.08	B	0.08
Northbound through and right	C	0.68	B	0.38	C	0.50
Southbound left	C	0.69	A	0.26	A	0.30
Southbound through and right	C	0.25	B	0.23	B	0.31
9th Avenue East at 10th Street East						
Overall	C		C		D	
Eastbound left and through	D	0.91	E	0.98	F	1.13
Eastbound right	A	0.17	A	0.11	A	0.13
Westbound left, through, and right	C	0.46	B	0.22	B	0.26
Northbound left, through, and right	C	0.42	C	0.36	C	0.43
Southbound left and through	C	0.25	B	0.20	C	0.25
Southbound right	A	0.21	A	0.24	A	0.28
9th Avenue East at 16th Street East						
Overall	C		C		C	
Eastbound left	C	0.05	C	0.05	C	0.06
Eastbound through and right	D	0.69	D	0.76	D	0.74
Westbound left	C	0.58	C	0.79	C	0.78
Westbound through	C	0.27	B	0.39	B	0.42
Westbound right	A	0.04	A	0.03	A	0.06
Northbound left	B	0.03	C	0.03	B	0.05
Northbound through and right	A	0.29	A	0.45	A	0.43
Southbound left	B	0.05	C	0.15	C	0.11
Southbound through and right	B	0.21	C	0.20	C	0.27

To improve existing conditions, a set of updated traffic signal timing plans were created. The updated AM peak hour signal timing plans have a cycle length of 80 seconds. During the PM peak hour, the first three intersections have a cycle length of 90 seconds and are coordinated,



whereas, the last intersection has a cycle length of 80 seconds. During the mid-day peak hour, only the second and third intersections are coordinated and have a cycle length of 80 seconds, whereas, the first intersection has a cycle length of 60 seconds and the last intersection has a cycle length of 80 seconds. The updated signal timing plan details are provided in **Appendix F4**.

The 9th Avenue corridor operations with improvements are summarized in **Table 4.19**. It is evident comparing **Table 4.18** and **Table 4.19** that the operations for all intersections are improved with the recommended signal timing plans.

Table 4.19: 9th Avenue Corridor Updated Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
9th Avenue East at 6th Street East						
Overall	A		B		B	
Eastbound left and through	D	0.43	B	0.23	D	0.61
Eastbound right	A	0.31	A	0.16	A	0.29
Westbound left, through, and right	B	0.29	B	0.09	C	0.24
Northbound left	A	0.16	A	0.25	A	0.21
Northbound through	A	0.19	A	0.17	A	0.20
Northbound right	A	0.03	A	0.02	A	0.02
Southbound left, through, and right	A	0.26	B	0.39	A	0.36
9th Avenue East at 8th Street East						
Overall	C		C		C	
Eastbound left	B	0.15	B	0.17	B	0.29
Eastbound through and right	D	0.89	D	0.76	D	0.78
Westbound left	C	0.71	C	0.66	C	0.76
Westbound through and right	C	0.61	C	0.53	C	0.67
Northbound left	C	0.11	C	0.11	C	0.10
Northbound through and right	C	0.79	B	0.47	B	0.54
Southbound left	C	0.68	B	0.39	B	0.45
Southbound through and right	B	0.27	B	0.29	B	0.36
9th Avenue East at 10th Street East						
Overall	B		B		C	
Eastbound left and through	C	0.82	C	0.85	C	0.89
Eastbound right	A	0.17	A	0.11	A	0.13
Westbound left, through, and right	B	0.37	A	0.18	A	0.17
Northbound left, through, and right	B	0.50	C	0.47	C	0.65
Southbound left and through	C	0.30	C	0.27	C	0.39
Southbound right	A	0.21	A	0.24	A	0.28
9th Avenue East at 16th Street East						
Overall	B		B		B	
Eastbound left	C	0.06	B	0.04	B	0.04
Eastbound through and right	D	0.64	C	0.59	C	0.52
Westbound left	C	0.60	B	0.64	B	0.65



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Westbound through	C	0.35	A	0.36	B	0.41
Westbound right	A	0.05	A	0.03	A	0.06
Northbound left	B	0.03	B	0.06	B	0.08
Northbound through and right	A	0.28	A	0.59	A	0.57
Southbound left	B	0.04	C	0.23	C	0.19
Southbound through and right	B	0.21	B	0.33	C	0.43

4.7.3 16th Street Corridor

The existing signal timing plans on the 16th Street corridor have a cycle length of 100 seconds and are coordinated. The Synchro analyses shows that only the eastbound direction has a through band of 7 seconds, 10 seconds, and 5 seconds during AM, Mid-day, and PM peak hours respectively. There are no through bands for traffic in the westbound direction during any of the peak periods. The existing traffic operations on the 16th Street corridor under the existing signal timing plans are summarized in **Table 4.20**.

Table 4.20: 16th Street Corridor Existing Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
16th Street East at 9th Avenue East						
Overall	B		B		C	
Eastbound left	A	0.01	D	0.10	D	0.11
Eastbound through and right	B	0.21	B	0.33	B	0.28
Westbound left	A	0.28	B	0.51	B	0.52
Westbound through	B	0.14	B	0.27	B	0.29
Westbound right	B	0.02	B	0.02	B	0.04
Northbound left	D	0.12	D	0.10	D	0.17
Northbound through and right	B	0.66	B	0.73	B	0.72
Southbound left	D	0.26	D	0.43	D	0.36
Southbound through and right	D	0.69	D	0.54	D	0.68
16th Street East at Zehrs Driveway						
Overall	B		C		C	
Eastbound left	A	0.01	A	0.07	A	0.07
Eastbound through and right	A	0.19	B	0.33	B	0.30
Westbound left	B	0.04	B	0.12	C	0.13
Westbound through and right	B	0.16	C	0.34	C	0.40
Northbound left	D	0.08	C	0.10	C	0.12
Northbound through and right	B	0.23	B	0.21	B	0.18
Southbound left	D	0.31	D	0.56	D	0.51
Southbound through and right	C	0.09	B	0.28	C	0.34
16th Street East at Heritage Place Driveway						



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Overall	C		C		D	
Eastbound left, through, and right	A	0.23	B	0.58	B	0.52
Westbound left and through	E	0.69	E	0.84	F	1.06
Westbound right	C	0.06	B	0.10	C	0.06
Northbound left	D	0.02	C	0.31	C	0.14
Northbound through and right	A	0.00	A	0.19	B	0.08
Southbound left	D	0.09	D	0.46	D	0.51
Southbound through and right	A	0.03	B	0.64	B	0.58
16th Street East at 16th Avenue East						
Overall	C		C		C	
Eastbound left	B	0.06	B	0.07	B	0.09
Eastbound through and right	B	0.16	B	0.26	B	0.27
Westbound left	A	0.06	A	0.10	A	0.08
Westbound through and right	B	0.14	B	0.20	B	0.24
Northbound left	D	0.45	D	0.60	D	0.71
Northbound through and right	C	0.26	C	0.46	C	0.31
Southbound left	C	0.13	C	0.25	C	0.13
Southbound through and right	C	0.54	C	0.54	C	0.57
16th Street East at 18th Avenue East						
Overall	C		B		C	
Eastbound left	D	0.16	C	0.19	C	0.10
Eastbound through and right	C	0.56	B	0.71	C	0.72
Westbound left	D	0.10	D	0.16	D	0.12
Westbound through and right	D	0.57	D	0.46	D	0.48
Northbound left	A	0.09	A	0.33	A	0.28
Northbound through and right	A	0.00	A	0.02	A	0.02
Southbound left	A	0.01	B	0.01	B	0.03
Southbound through and right	A	0.02	A	0.03	A	0.06

A set of updated traffic signal timing plans were created to improve operations. The updated signal timing plans have a cycle length of 90 seconds for all peak periods and are coordinated. The updated signal timing details are provided in **Appendix F4**.

The existing 16th Street corridor operations with the proposed modifications to the signal timing plans are summarized in **Table 4.21**. It is evident comparing **Table 4.20** and **Table 4.21** that the operations for all intersections are improved.

Table 4.21: 16th Street Corridor Updated Signal Timing Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
16 th Street East at 9 th Avenue East						



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Overall	B		B		B	
Eastbound left	D	0.09	B	0.03	A	0.02
Eastbound through and right	B	0.21	C	0.40	B	0.29
Westbound left	A	0.27	A	0.48	A	0.50
Westbound through	A	0.15	A	0.27	A	0.30
Westbound right	A	0.02	A	0.02	A	0.04
Northbound left	C	0.10	C	0.09	C	0.15
Northbound through and right	B	0.63	B	0.71	B	0.69
Southbound left	D	0.23	D	0.39	D	0.32
Southbound through and right	D	0.64	D	0.49	D	0.64
16th Street East at Zehrs Driveway						
Overall	A		A		A	
Eastbound left	A	0.01	A	0.07	A	0.07
Eastbound through and right	A	0.18	A	0.34	A	0.30
Westbound left	A	0.04	A	0.13	A	0.14
Westbound through and right	A	0.16	A	0.34	A	0.39
Northbound left	C	0.06	C	0.10	C	0.10
Northbound through and right	B	0.19	B	0.20	B	0.19
Southbound left	D	0.22	D	0.50	D	0.43
Southbound through and right	C	0.07	B	0.25	B	0.30
16th Street East at Heritage Place Driveway						
Overall	B		C		C	
Eastbound left, through, and right	A	0.25	B	0.60	B	0.58
Westbound left and through	C	0.67	C	0.84	D	0.89
Westbound right	A	0.06	A	0.10	A	0.05
Northbound left	C	0.02	C	0.38	C	0.16
Northbound through and right	A	0.00	A	0.19	B	0.09
Southbound left	D	0.06	D	0.37	D	0.44
Southbound through and right	A	0.03	B	0.59	B	0.54
16th Street East at 16th Avenue East						
Overall	B		B		B	
Eastbound left	A	0.07	A	0.08	A	0.09
Eastbound through and right	A	0.18	A	0.29	A	0.30
Westbound left	A	0.07	A	0.11	A	0.09
Westbound through and right	A	0.15	A	0.22	A	0.26
Northbound left	C	0.40	C	0.48	C	0.54
Northbound through and right	C	0.23	C	0.32	B	0.23
Southbound left	C	0.11	C	0.27	C	0.12
Southbound through and right	C	0.44	C	0.45	C	0.44
16th Street East at 18th Avenue East						
Overall	A		B		B	
Eastbound left	A	0.03	A	0.05	A	0.02



Intersection & Movement	Weekday AM Peak Hour		Weekday Mid-day Peak Hour		Weekday PM Peak Hour	
	LOS	v / c	LOS	v / c	LOS	v / c
Eastbound through and right	A	0.13	A	0.27	A	0.25
Westbound left	A	0.02	B	0.02	B	0.02
Westbound through and right	A	0.11	B	0.11	B	0.12
Northbound left	C	0.31	C	0.71	C	0.55
Northbound through and right	C	0.01	B	0.04	B	0.04
Southbound left	D	0.05	D	0.07	D	0.18
Southbound through and right	B	0.09	C	0.15	B	0.26

4.8 Conversion of 1st Avenue West to One-way Southbound

This section outlines the impacts of converting 1st Avenue West to one-way southbound from one-way northbound. Presently, 1st Avenue West is one-way northbound between 8th Street West and 9th Street West. There have been discussions by the Operations Committee to convert 1st Avenue West to one-way southbound to allow for bus service, drop-offs, and pick-ups in front of the key attractions on 1st Avenue West (such as the library, art gallery, and churches), instead of on the opposite side of the street where patrons then have to cross 1st Avenue West. There have also been discussions to convert 1st Avenue East from two-way to one-way northbound between 8th Avenue and 9th Avenue to provide a one-way pair.

4.8.1 Only Convert 1st Avenue West to One-Way Southbound

Transit

The existing transit service on 1st Avenue West is the ‘Brooke’ route which services the northwest part of the city. It currently travels northbound on 1st Avenue West from 8th Street West. If 1st Avenue West is converted to southbound, the bus service would have to loop around using 2nd Avenue West, 9th Street West, and then 1st Avenue West southbound, then proceed back north using 2nd Avenue West again. Additional travel distance and potential delays at the 2nd Avenue West signal and 8th Street West / 1st Avenue West stop sign will impact service and potentially increase operating costs. Another alternative would be to modify the route and use 2nd Avenue West instead of 1st Avenue West. A bus stop would need to be provided on 8th Street West at 2nd Avenue West immediately south of the library.

Either option results in a route change for the existing transit service resulting in changes to travel times and route schedules.

Intersection Operations

Turning movement counts were collected at signalized intersections around the area of 1st Avenue West (2nd Avenue West at 8th Street and 9th Street West, 2nd Avenue East at 8th Street and 9th Street East, 10th Street at 2nd and 1st Avenues) only. Turning movement counts on 1st Avenue West at 8th Street West and 1st Avenue West at 9th Street West were estimated based on the existing turning movement counts.



Under existing conditions, the intersection of 8th Street West and 1st Avenue West, the southbound shared left-right turns would operate with a level of service 'C' and a volume to capacity ratio of 0.29. This is based on an estimated 130 southbound trips during the existing weekday PM peak hour. If the volumes were to increase by 1.7 times to approximately 220 vehicles, then the intersection would reach its capacity (level of service 'F' with a volume to capacity ratio greater than 0.90). Due to the intersection proximity to the existing signalized intersection of 8th Street West and 2nd Avenue West, installing traffic signals or an all-way stop at this intersection is not recommended.

The intersection of 2nd Avenue West and 8th Street West is approximately 30m from 1st Avenue West. Based on the existing analysis, the 50th and 95th percentile queue reach for the westbound movement on 8th Street West is 36m and 69m respectively. This indicates that southbound motorists on 1st Avenue West attempting to make left or right turns would only be able to do so less than 50% of the time during peak hours without being blocked. This would result in traffic congestion on three sides of the library and art gallery (1st Avenue West, 8th Street, and 2nd Avenue West).

The intersection of 1st Avenue West and 9th Street West is currently an all way stop controlled intersection with prohibited eastbound right turns, westbound left turns, and southbound through movement. If 1st Avenue West is converted to one-way southbound from 9th Street West, then it removes the northbound stop control movement, but the westbound left turn, eastbound right turn, and southbound through movement would need to be included. As this intersection is already all-way stop controlled, then this should not impact overall intersection operations.

Sight Distance

As indicated in the previous section, the distance on 8th Street West between 2nd Avenue West and 1st Avenue West is approximately 30m. Based on the *TAC Geometric Design Guide for Canadian Roads*, the minimum stopping sight distance is 45m for a design speed of 40km/h. Traffic attempting to make a southbound left turn at the 2nd Avenue West and 8th Street may not have sufficient stopping sight distance with the 1st Avenue West at 8th Street West southbound left turn traffic.

Parking

The current parking is located on the east side of 1st Avenue West. It is angled based on the northbound direction of travel on 1st Avenue West. By converting 1st Avenue West to southbound only, it is expected that the parking will be maintained on the east side of 1st Avenue West and that by converting the angle of parking, the number of spaces should be equal to what currently exists.



Pros	Cons
<ul style="list-style-type: none"> ▪ Maintain parking supply ▪ Intersection of 1st Avenue West and 9th Street West is converted to three-way stop from four-way stop – improved operations. ▪ Drop-offs / pick-ups located in front of attractions 	<ul style="list-style-type: none"> ▪ Motoring public is conditioned to the current northbound direction ▪ Congestion surrounding the library (1st Avenue, 8th Street, and 2nd Avenue) – vehicle queues on 8th Street West block 1st Avenue West more than 50% of the time. ▪ Proximity of 8th Street and 1st Avenue intersection to 8th Street and 2nd Avenue intersection ▪ Cost to restripe parking ▪ Cost to relocate bus stop ▪ Rerouting of bus service may increase annual operating costs

Summary

It is recommended that 1st Avenue West remain one-way northbound due to the close proximity of the intersections of 1st Avenue West at 8th Street West, and 2nd Avenue West and 8th Street West, and the potential for congested conditions if 1st Avenue West was converted to one-way southbound only.

4.8.2 Convert 1st Avenue West to One-way Southbound and 1st Avenue East to One-Way Northbound

The same issues related to the option of reversing 1st Avenue West to one-way southbound can be cited for the potential conversion of 1st Avenue East to one-way northbound. These include the available sight distance between the intersections of 9th Street East at 1st Avenue East and 9th Street East and 2nd Avenue East, and the queue reach impact from the intersection of 9th Street West and 1st Avenue West. Additional disadvantages include:

- The parking spaces on west side of 1st Avenue east are currently oriented to provide ingress for southbound traffic. Restriping of the parking on the west side of 1st Avenue East to orient the stalls for northbound traffic would be required and may result in fewer parking spaces.
- The one-way southbound traffic on 1st Avenue East between 10th Street and 9th Street will impact the continuity for through traffic with the south leg and therefore traffic would have to make a left or right turn to select other routes.
- The existing right-of-way constraints limit sight distances at this intersection.

Summary

Converting 1st Avenue East between 8th Street and 9th Street to one-way is not recommended.



4.9 Community Traffic Issues

Traffic infiltration is a growing concern among residents in Owen Sound. Traffic infiltration occurs primarily when delays on the arterial network are perceived by motorists as excessive due to congestion, or by poor road design that may limit access for larger vehicles. As part of the TMP the City requested that community traffic and safety issues on roadways such as Alpha Street, Moores Hill, and 15th Street A/B be addressed through the development of traffic calming policies and the assessment of the potential of installing traffic calming measures.

4.9.1 Alpha Street

Alpha Street is classified as an arterial road within the City of Owen Sound. Alpha Street extends from 9th Avenue West to 14th Street West. It is a two-lane roadway with a posted speed limit of 50km/h. There are several residential driveways with direct access to the street. Four major collector roads intersect Alpha Street at skewed angles that can cause difficulties for vehicles turning to / from Alpha Street. From 14th Street West to 6th Avenue West, the sidewalks are located at the back of the curb which is a potential safety issues for pedestrians as they are close to the traveled roadway. There is also no sidewalk on the west side of Alpha Street between 6th Avenue West and 7th Avenue 'A' West, and 8th Avenue West and 11th Street West. Residents perceive a significant amount of truck traffic using Alpha Street especially when the grain elevators are operational. Concerns have been expressed by residents about vehicle speeds and truck traffic. Suggested improvements from residents include the placement of a stop sign at the top of the hill, installing school or playground warning signs, and greater enforcement.

Based on the evaluation of alternatives for Alpha Street, the recommended alternative would be the placement of Speed Cushions based on the anticipated speed reduction. However, due to the cost to install the speed cushions and the potential negative response they might receive from the local residents and city services (emergency and winter maintenance), the following is our recommended traffic calming measures for Alpha Street:

- Improve posted speed signage (larger signs) and install warning signs (traffic calmed neighbourhood signs).
- Consider transverse lane markings on downhill lane (northbound).
- Install a railing between the travelled portion of the roadway and sidewalk on both sides of Alpha Street along the hill portion of the road between 6th Avenue West and 7th Avenue 'A' West as a buffer for pedestrians.
- Monitor situation and if conditions do not improve, then consider installing speed cushions.

4.9.2 Moores Hill

Moores Hill is perceived by some residents to have significant safety issues due to the existing grade and road configuration. Other residents have reported that there are no significant safety related issues and that nothing needs to be done. The main concerns on this



roadway are traffic speeds, left turns from 2nd Avenue West up the hill, vehicles travelling straight through on 2nd Avenue West and disregarding the yield sign, and vehicles attempting a right turn onto 2nd Avenue West as it is not possible to do so without encroaching into the opposing traffic lane.

Based on the evaluation of alternatives for Moores Hill, the recommended alternative would be to reassess the location of the stop bar at the top of the hill for southbound motorists on 4th Avenue West to improve sight lines down the hill, and also install 40 km/h speed limit signs on Moores Hill.

- Post Maximum Speed limit signs (40 km/h) and warning signs (Traffic Calmed Neighbourhood signs).
- Reassess the location of the stop bar at the top of the hill for southbound motorists on 4th Avenue West to improve sight lines.
- Monitor situation and if conditions do not improve, then revisit traffic calming policy and reconsider other traffic calming measures.

4.9.3 15th Street East ‘B’

15th Street East ‘B’ is a west to east local road from 15th Street East ‘A’ to 12th Avenue East with a posted speed limit of 40km/h. 15th Street East ‘B’ consists mainly of low rise semi-detached residential units with no sidewalk on either side of the road. There is a perceived issue of 15th Street East ‘B’ being used as a short-cut by vehicles and trucks weaving through the subdivision using 10th Avenue East and 12th Avenue East to by-pass the intersections of 10th Street East at 9th Avenue East and 9th Avenue East and 16th Street East.

Based on the evaluation of alternatives for 15th Street East ‘B’, the recommended alternative would be:

- Install a sidewalk on one-side of the road as a minimum.
- Monitor traffic in the subdivision subsequent to the extension of 10th Street East to 16th Avenue East (planned for completion in 2011) should eliminate the perceived short-cutting.
- If conditions do not improve, then consider installing speed cushions.

The detailed results of the Community Traffic Issues findings are attached in **Appendix G**.



4.10 Review of Street Name Signs

The street name sign system in the City of Owen Sound was reviewed based on a site investigation undertaken in September 2009. The intent of the review is to enhance the overall safety for motorists and the improve way finding throughout the City. The aging population in Owen Sound is also a factor in considering improvements to street name signs. Generally, the street name sign system in the City of Owen Sound has the following deficiencies:

- No advanced street name signs were provided for key arterials and collector roads,
- Street name signs located on the left side of road are not visible to approaching traffic,
- No overhead and oversized street name signs are provided at signalized intersections where traffic signal arms allow for this type of sign; and,
- Two street name signs share one pole and are not visible due to size and location of poles.

In addition, there are opportunities for the City of Owen Sound to integrate Corporate Branding into the street sign design.

The objectives of the street name signs are to:

- Establish a clearly legible message hierarchy for Street Names, Street Numbers, Districts, and Downtown.
- Coordinate design with overall streetscape improvements.
- Raise the quality of standards of street sign design, construction and attachment method.
- Provide basis for future system expansion.

The challenges for the City to meet the objectives of the street name signs include:

- Accommodate wide range of message lengths.
- Legibility for older drivers (fastest growing demographic).
- Integrate branding (i.e. Downtown, Avenue – Street, West – East, North-South, West Hill – East Hill, Harbour, etc).
- Fasten securely to a myriad of lamp pole and post conditions.
- Eliminate parts that are prone to rust, discolouration and fading.

The following recommendations are proposed:

- Proceed with a consistent sign form that is appropriate throughout Owen Sound.
- Create a clear message hierarchy that emphasizes Street Name legibility.
- Consistently present street names in reflective white lettering on darker backgrounds for maximum legibility.
- Place advanced street name signs for key arterial and collector roads.
- Remove clutter around from street name signs (i.e. tree foliage, other signs).
- Provide larger, overhead street name signs on signal arms at signalized intersections.
- Provide each street name sign for all approaches at far (near) right corner of intersections.

The overall recommendation is to proceed with a City wide sign review to inventory all street name signs, and to develop an overall street name sign strategy that best represents Owen Sound by using public and stakeholder input.



5. FUTURE CONDITIONS

5.1 TRANSPORTATION MODEL

An assessment of future traffic conditions was undertaken as part of the Transportation Master Plan. The initial step in the traffic assessment was to establish the existing capacity and operating characteristics of the road network. The future assessment is to identify mid to long term transportation infrastructure deficiencies. A number of potential improvements would then be developed to maintain or enhance the mobility for residents of the City of Owen Sound. A number of improvement alternatives would then be developed to assess the effectiveness of addressing the specific problems or opportunities. The two measures of effectiveness used for the analysis of future conditions include link capacity (vehicles per lane/per hour) and intersection capacity (volume / capacity ratio). Both are reported using a level of service indicator.

5.1.1 Model Development

A transportation model for the PM peak hour was developed using Microsoft Excel and Synchro7 software which models intersection and mid-link capacities. The model includes existing, 5 year, 10 year, and 20 year horizon years. As stipulated in the Terms of Reference the future horizon years that were assessed include 2011, 2016, and 2026 respectively.

Traffic volumes for the base model were obtained from a series of traffic counts at several key locations (arterial to arterial, and arterial to collector road intersections) undertaken in September / October 2009. The future horizon years include the estimated increase in regional background traffic growth combined with traffic volumes generated from future planned and/or proposed developments within and around Owen Sound.

In the model, the traffic generated by the smaller future development areas was assumed covered by the general background growth since the trips generated by the smaller development areas are relatively low based on population and employment forecasts. Larger development areas that are anticipated to generate a higher number of trips in the future were considered separately and specific trip generation rates were applied based on the primary land use proposed in these larger development areas.

For the background traffic growth, a one percent (1%) annual growth rate was assumed for the major arterial roads while a half percent (0.5%) annual growth rate was assumed for the area major and minor collector roads. The traffic growth rates are based on historic traffic growth rates throughout the City of Owen Sound along with forecasted population and employment numbers.

The planned and proposed development land uses, sizes, and locations were determined from the *Owen Sound Official Plan, March 2006*. Based on the information obtained from the *Appendix Schedule – Vacant Land* and the *Appendix B – Vacant Residential Land Consumption*, future residential development includes all lands identified (an approximate



area of 122.6 hectares). For modeling purposes, the residential development was divided into three zones: southwest residential area; northeast residential area; and east residential area. It was assumed that no future residential development would occur in the 2011 horizon year. By the 2016 horizon year, it was assumed that approximately 38 percent of the 122.6ha (46.6ha) would be developed while the remaining 62 percent of the residential development would be built out by the 2026 horizon year. The Cobble Beach area which is located northwest of the City was also accounted for in the development of the future forecasts. Cobble Beach is expected to be an area that will experience significant future growth in residential units. Technically the Cobble Beach area is outside of the City but the attractiveness of Owen Sound as a centre of employment and shopping would suggest that the majority of traffic generated by this development would have an origin or destination in Owen Sound. An assumption was made for Cobble Beach area staging for the trip generation purpose that 20% of total 2,000 residential units will be developed before 2011, additional 50% of total units will be developed between 2011 and 2016, and the rest of 30% will be developed between 2016 and 2026.

The *Owen Sound Official Plan* also identifies future employment lands. The developments incorporated into background traffic growth include vacant commercial, industrial, and waterfront mixed use lands. It was assumed that a total of 65ha of employment land will be developed during the period between 2006 and 2026. This 65ha of employment lands include 50ha of industrial land, 1.6ha of waterfront mixed used, and 13.4ha of commercial.

The future trips generated by the proposed lands were estimated using trip rates from *Trip Generation, 8th Edition* published by the *Institute of Transportation Engineers*. For residential land uses, it was assumed that all residential would consist of Single Family Detached Housing at an assumed area of 557 sq. metres per unit. All future traffic volumes for the industrial lands would be estimated using an Industrial Park land use trip rate which accounts for a variety of industrial land uses from light / office land uses to medium and large industrial. It was assumed that utilizing a Shopping Centre land use trip rate would be appropriate to estimate the commercial trips as it encompasses a variety of different commercial land uses from banks, fast food outlets, variety stores, and larger shopping centres. It should also be noted that a 40% interaction between residential and the commercial, industrial land uses was considered. The amount of interaction was determined using the findings of the origin-destination study. With almost 50 of trips originating in Owen Sound and almost 90% of trips destined for Owen Sound the utilization of 40% was considered to be conservative for the purposes of the model development.

5.2 Network Performance Year 2011 and 2016

The intermediate stage 2011 and 2016 network performance was analyzed to assess the road network deficiencies. The detailed analysis results were provided in **Appendix F5**.



5.3 Network Performance Year 2026

Since the long-term population and employment forecasts are most reliable for the year 2026, it has been selected as the horizon year for the analysis of future conditions in the long-term. The 2026 horizon year also represents the worst case scenario given that it assumes the full build-out of vacant residential, industrial and commercial lands. The assessment of travel conditions assumed that all planned or programmed road network improvements would be in place. The only planned improvement included in the model was the extension of 10th Street. The forecasting and network assessment methodology is based on the principal assumption that current travel trends will remain stable and continue in the future.

5.3.1 2026 Road Network Capacity

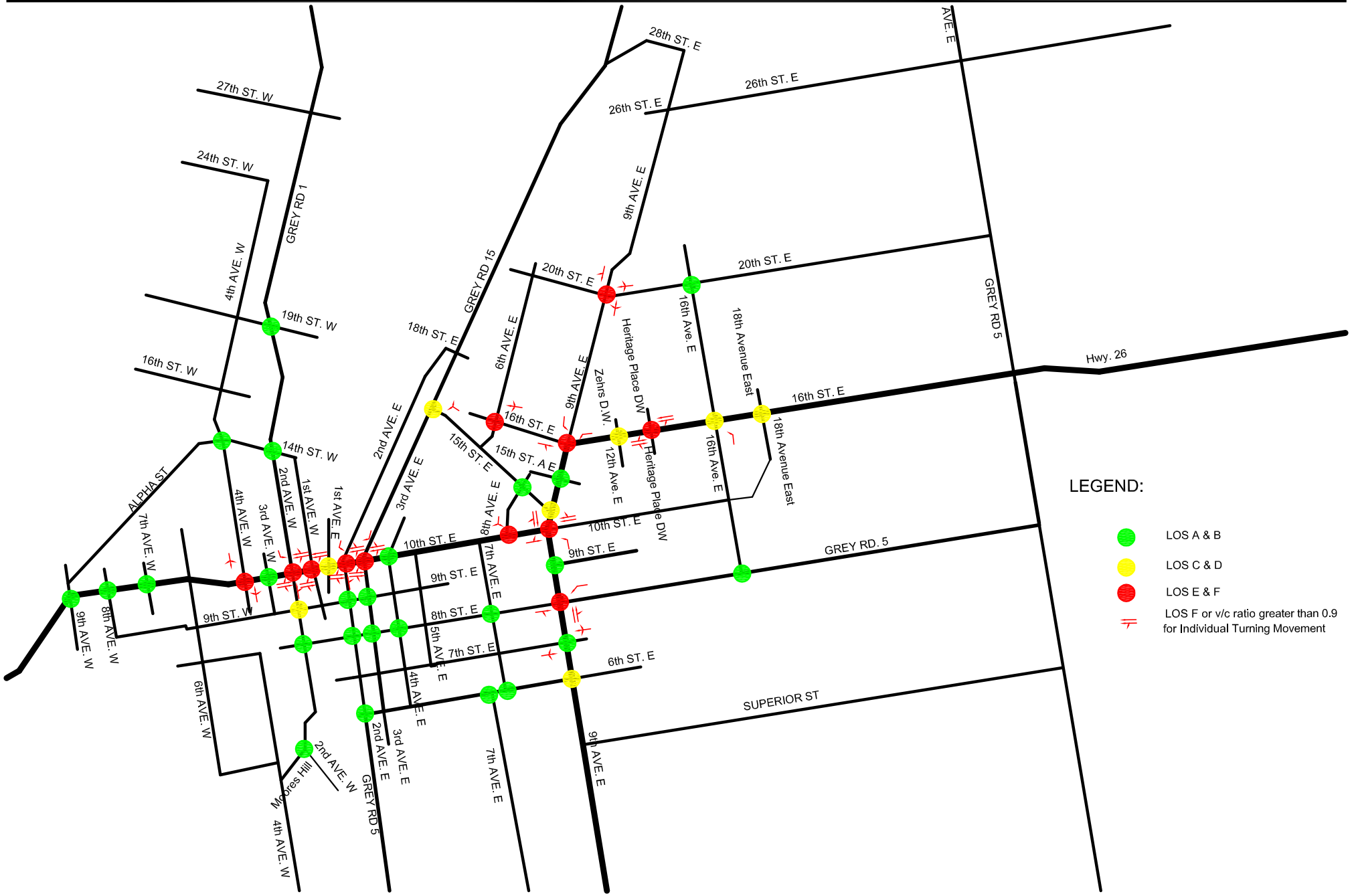
Exhibit 5.1 illustrates the volume to capacity ratios calculated for the future travel conditions during the 2026 PM peak period for select screenlines situated around the City of Owen Sound.

The screenlines which capture traffic flows on east-west routes such as 10th Street, 9th Street, and 8th Street across the Sydenham River, 10th Street West and Alpha Street in the west end, and Superior Street, 8th Street East, 16th Street East, 20th Street East, and 26th Street East in the east end. As shown in **Exhibit 5.1** east-west arterials located in the west and east sides of the city have sufficient residual capacity available. The east-west crossings of the Sydenham River also have some reserve capacity available during the PM peak hour with the exception of 10th Street which is congested in the Downtown area of the City. The north-south screenlines (Grey County Road 1 and 4th Avenue West in the Northwest, Grey County Road 15 and 9th Avenue East in the north east, and Grey County Road 5 and 9th Avenue East in the south) are showing sufficient capacity available during the 2026 PM peak hour.

5.3.2 2026 Intersection Capacity

Exhibit 5.2 illustrates the level of service calculated for the future (2026) traffic conditions during the PM peak hour for select signalized and unsignalized intersections situated throughout the study area.

As shown in **Exhibit 5.2**, the majority of key intersections (arterial to arterial or collector to arterial) operate with an overall level of service 'E' or worse during the future 2026 PM peak hour. The signalized intersections along the arterial connecting links (i.e. the 10th Street corridor downtown, 9th Avenue East, and 16th Street East) show that future intersection operations are the main cause of congestion on these corridors.



LEGEND:

- LOS A & B
- LOS C & D
- LOS E & F
- ⊥ LOS F or v/c ratio greater than 0.9 for Individual Turning Movement

Exhibit 5.2 2026 PM Peak Hour Level of Service



6. TRANSPORTATION NEEDS

6.1 Road Capacity Needs

6.1.1 Existing Conditions

Under existing conditions, no major road capacity improvements are seen as necessary. However, signal timing improvements can be implemented to address intersection needs at the following locations:

Location	Improvement Opportunity
16th Street at Heritage Place Driveway	Signal Timing Optimization
9th Avenue East at 8th Street East	Signal Timing Optimization
3rd Avenue East at 15th Street East	Traffic Signal Installation
9th Avenue East at 10th Street East	Signal Modification (Split)
3rd Avenue East at 15th Street East	Signal Installation

6.1.2 2016 Conditions

By the year 2016, there are a number of intersections that are expected to have volumes that will meet the warrants for traffic control signals. Traffic volumes and traffic conditions on 10th Street indicate that vehicle queues may exceed available storage capacity for turning movements. Potential improvements that may address these needs require capital investment and may be constrained by property requirements. Improvements that may be considered further to address these needs are summarized below:

Location	Improvement Opportunity
10th Street at 2nd Avenue West	Add a 15m WBR lane
10th Street at 2nd Avenue East	<i>Add a 63m EBL lane</i>
10th Street at 7th Avenue East	Traffic Signal Installation
10th Street at 9th Avenue East	Modify EB lanes from a left turn lane, a shared through / left turn lane, and a right turn lane to a left turn lane, a separate through lane, and a through / right turn lane.
16th Street at 6th Avenue East	Traffic Signal Installation
9th Avenue East at 20th Street East	Traffic Signal Installation
3rd Avenue East at 15th Street East	Traffic Signal Installation

Notes: the italicized texts indicate that the improvements required are constrained by the available spaces



6.1.3 2026 Conditions

By 2026, it is anticipated that volumes will exceed capacity on 9th Avenue, 10th Street and on 16th Street at a number of intersections. Improvements that could address these needs during a typical weekday and under peak summer conditions include either new road capacity (major widening or new corridor) or intersection improvements summarized below:

Location	Improvement Opportunity	
	Typical Weekday	With Summer Factor
10th Street at 9th Avenue West		Add a 20m WBR lane
10th Street at 3rd Avenue West		Add a 15m EBR lane
10th Street at 2nd Avenue West	Add a 40m WBR lane, add a northbound through lane and taper back to 1 lane	Add a WB through lane and an EB through lane, add a northbound through lane and taper back to 1 lane, add an additional SBL lane to make it a dual left
10th Street at 1st Avenue West		<i>Add an additional EB through lane</i>
10th Street at 1st Avenue East		<i>Add an additional WB through lane</i>
10th Street at 2nd Avenue East	<i>Add a 90m EBL lane and 15m WBL lane</i>	<i>Add a 90m EBL lane and 15m WBL lane, and one WB through lane</i>
10th Street at 3rd Avenue East	<i>Add a 20m EBL lane and 20m WBL lane</i>	<i>Add a 30m EBL lane and 20m WBL lane</i>
10th Street at 9th Avenue East	Modify EB Lane from left, left and through shared, and right to Left, through, and through and right shared.	Add a 15m SBL lane, a 20m WBL lane, one EB through lane and two WB through lanes, an additional EBL to make a dual left
16th Street at 6th Avenue East	Traffic Signal Installation	Traffic Signal Installation
16th Street at 9th Avenue East	Add a 50m NBR lane	Add a 50m NBR lane, change WBR to WB through lane, add an additional EB through lane
16th Street at Heritage Place Driveway	Add a 75m EBL lane	Add a 75m EBL lane
16th Street at 16th Avenue East	N/A	Add a 30m EBR lane
9th Avenue East at 20th Street East	Traffic signal installation, add a 55m WBL lane, a 45m NBL lane	Traffic signal installation, add a 55m WBL lane, a 45m NBL lane
9th Avenue East at 8th Street East	Add a 30m NBR lane	Add a 30m NBR lane and an additional EB through lane

Notes: the italicized texts indicate that the improvements required are constrained by the available spaces



If traffic patterns were to divert to better utilize reserve capacity on streets parallel to 10th Street (eg. 8th Street and 9th Street), then the operational needs on 10th Street would be less significant. If traffic were rerouted to 8th Street and 9th Street, intersection improvement opportunities to address needs on a typical weekday with traffic worth considering further are noted below:

2026 Total Traffic Improvement Requirements with Downtown Area traffic transferred from 10th St to 9th and 8th St.

Location	Improvements	
	With Traffic Diversion	Without Traffic Diversion
10th Street at 9th Avenue West		
10th Street at 3rd Avenue West		
10th Street at 2nd Avenue West	Add a 70m WBR lane	Add a 40m WBR lane, add a northbound through lane and taper back to 1 lane
10th Street at 1st Avenue West		
10th Street at 1st Avenue East		
10th Street at 2nd Avenue East	*Prohibit EBL traffic during peak hours	<i>Add a 90m EBL lane and 15m WBL lane</i>
10th Street at 3rd Avenue East		<i>Add a 20m EBL lane and 20m WBL lane</i>
10th Street at 4th Avenue East	Add a 40m NBR and 52m WBL	
10th Street at 7th Avenue East	Traffic Signal Installation	Traffic Signal Installation
10th Street at 9th Avenue East	Modify EB Lane from left, left and through shared, and right to Left, through, and through and right shared.	Modify EB Lane from left, left and through shared, and right to Left, through, and through and right shared.
16th Street at 9th Avenue East	Add a 50m NBR lane	Add a 50m NBR lane
16th Street at Heritage Place Driveway	Add a 75m EBL lane	Add a 75m EBL lane
16th Street at 16th Avenue East		N/A
9th Avenue East at 20th Street East	Traffic signal installation, add a 55m WBL lane, a 45m NBL lane	Traffic signal installation, add a 55m WBL lane, a 45m NBL lane
9th Avenue East at 8th Street East	Add a 30m NBR lane	Add a 30m NBR lane
3rd Avenue East at 15th Street East	Traffic Signal Installation	Traffic Signal Installation

Notes: 1. *EBL traffic can be redistributed to 1st Avenue E eastbound right turn, 2nd Avenue E eastbound right turn, 2nd Avenue E northbound through, 3rd Avenue E northbound through, 4th Avenue E northbound through
 2. The italicized texts indicate that the improvements required are constrained by the available spaces



6.2 Active Transportation Modes

The bicycle and pedestrian networks as identified in City of Owen Sound Official Plan have not been fully developed and implemented. Opportunities for implementation need to be developed.

6.3 Problem Statement

Based on traffic forecasts and a detailed analysis of existing and future conditions, the key transportation challenges for Owen Sound are summarized below:

- Owen Sound functions as a regional centre for Grey and Bruce Counties, and is therefore affected by overall growth in the Region. The majority of traffic in the study area has origins and destinations to Owen Sound. This reliance on the Owen Sound transportation network will continue to increase as the City and adjacent municipalities in Grey and Bruce Counties experience modest growth.
- Approximately 15% to 25% of traffic (depending on the route and principal direction) in Owen Sound is through traffic originating and/or destined to other municipalities in the County and Province. As the general population in Ontario and abroad grows, and tourist and recreational pursuits continue to grow, through traffic will further increase pressures on the City road network.
- As with the arterial road network, the collector road network lacks mid-block, continuous east-west and north-south connections due to the natural environmental and cultural environment heritage of the area. This lack of connectivity puts pressures on the few through connections present in the City to facilitate longer distance travel. It also increases the propensity for traffic to find alternative routes on roadways that are not designed or intended to accommodate modest to heavy volumes of traffic.
- Transportation requirements are closely related to economic activity. In economic terms, however, transportation is a “diseconomy” factor, meaning that the increase in cost of the transport of goods and services is directly related to increases in the cost of purchasing goods and services, and is subsequently passed on the consumers. Increases in traffic congestion and delays will negatively affect the City’ economic well-being and competitiveness.

Considering all the above, the assessment of existing and future conditions concludes that the provision of additional intersection capacity at select intersections is required in addition to the need for additional capacity on 10th Street through the Downtown.

There also needs to be a greater emphasis or reliance on other modes of travel. Enhanced public transit, improved walking and cycling facilities, and transportation substitutes such as communication technologies, will be required to meet the accessibility and mobility needs of the City’s residents and businesses.



7. TRANSPORTATION ALTERNATIVES

7.1 Identification of Transportation Planning Alternatives

Following the requirements of Phases 1 and 2 of the Environmental Assessment process, the project team identified and evaluated three long-term, alternative transportation planning strategies, plus a Do-Nothing scenario. The transportation planning alternatives were evaluated for 2026 travel demands, against a set of Evaluation Criteria to gauge their ability to address the challenges identified in the Problem Statement.

Do Nothing

The “Do Nothing” scenario reflects the current condition of the roadway network carried over to the 2026 horizon year without any capacity improvements. Except for the 10th Street extension, there are no planned expansions or additions to the arterial road network or Provincial highway system.

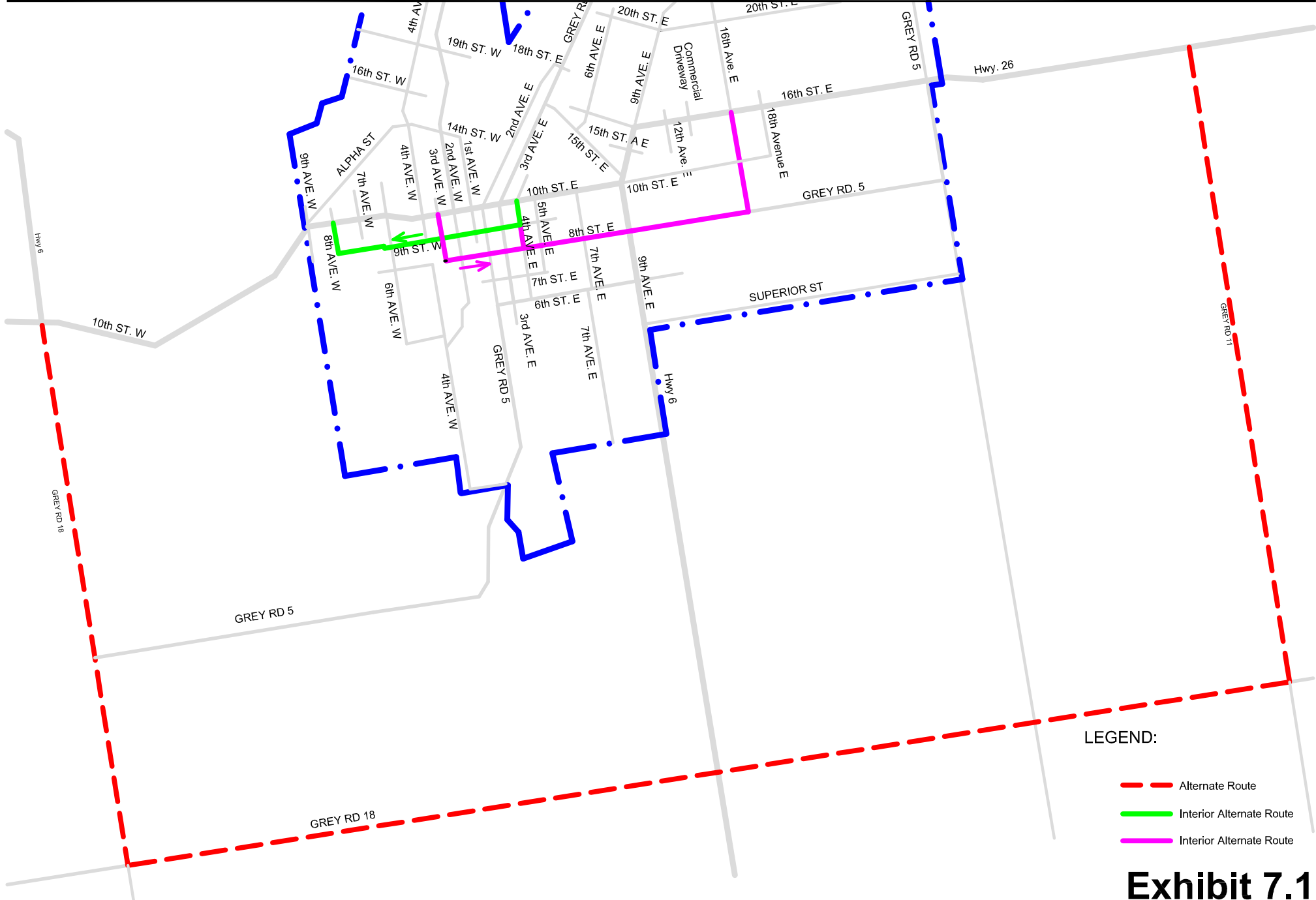
The 10th Street extension has been included in all alternatives as it was as already planned and programmed to be in service by 2011.

The alternative transportation strategies and Do-Nothing scenario are summarized in **Table 7.1**. The essential principles of the three alternative transportation planning strategies are summarized below.

Alternative 1 – Maximize Use of Existing Infrastructure

Alternative 1, illustrated in **Exhibit 7.1**, does not propose any significant infrastructure improvements, rather the intent of this alternative is to maximize the use of existing infrastructure and direct through traffic from routes that have capacity deficiencies onto alternative routes that have significant reserve capacity. The primary transportation issue that needs to be resolved to the extent possible is to reduce the amount of through traffic using 10th Street through the Downtown area across the Sydenham River.

Through traffic that normally travels along the corridors of 10th Street and 16th Street East will be redistributed onto the alternate routes by use of either static or dynamic signage. The alternate routes include an outer alternate route and inner alternate routes.



- LEGEND:
- Alternate Route
 - Interior Alternate Route
 - Interior Alternate Route

Alternative 1 - Maximum Use of Existing Infrastructure

Exhibit 7.1



The outer alternate route is intended to direct through traffic away from the City's core area. The outer route starts from the intersection of Kings Highways 6 and 21 and Grey Road 18 (Springmount), then travels south along Grey County Road 18, turns to the east to intersect with Kings Highway 6 and 10 at Rockford, then continues east until Grey County Road 11, then continues north to Kings Highway 26. The total distance of this outer alternate route is approximately 21 kilometres. The estimated total travel time along the outer alternate route is approximately 16 minutes when accounting for the posted speed limits and some delay at signalized intersections. The total distance for traffic using 10th Street and 16th Street East through the City is approximately 11 kilometres. The calculated total travel time under future 2026 conditions is estimated to be approximately 18 minutes. Although the outer alternate route is 10 kilometres longer than the 10th Street and 16th Street East (more direct) route through the City, approximately 2 minutes of travel time will be saved. This time saving is approximately 10% of the total travel time. By virtue of the fact that your travel along this outer alternate route is primarily unimpeded most motorists will also perceive a times savings likely greater than the estimated savings in travel time.

Approximately 10 percent (240 vehicles per hour) of the through trips currently using 10th Street / 16th Street East will be attracted to this route.

The inner alternate route is intended to redistribute traffic off of 10th Street within the Downtown core area to free up capacity across the Sydenham River. For westbound traffic, the inner alternate route would start from the intersection of 4th Avenue East and 10th Street East, turn left onto 4th Avenue East, turn right onto 9th Street East, turn right at the intersection of 9th Street West and 8th Avenue West, and then turn left onto 10th Street West at the intersection of 10th Street West and 8th Avenue West. For eastbound traffic, the inner alternate route would start from the intersection of 3rd Avenue West and 10th Street West, turns right onto 3rd Avenue West, turns left at the intersection of 8th Street West, and then extends along 8th Street easterly. Once on 8th Street, traffic can access the downtown core via 2nd Avenue East and 3rd Avenue East, and can also access the 16th Street East commercial area via 9th Avenue East or 16th Avenue East, and can continue to points east via 8th Street East.

The inner alternate routes also can be modified as a one-way system between 4th Avenue East and 3rd Avenue West. For instance, 9th Street can be converted for westbound travel only between 4th Avenue East and 3rd Avenue West while 8th Street can be converted for eastbound travel only between 4th Avenue East and 3rd Avenue West. While the implementation of a set of one-way pairs on 8th Street and 9th Street respectively is not essential for the movement of automobile and truck traffic it may be advantageous for the development of cycling routes through the downtown.

To increase the effectiveness of the inner alternate route and attract traffic to use the inner alternate routes, several all-way stop controlled intersections along 8th Street and 9th Street will need to be removed to give the right-of-way to east-west traffic thereby reducing delay and reducing travel time for the through traffic.



8th Street and 9th Street provide additional capacity for approximately 400 vehicles per hour without the need for any further roadway improvements. If traffic signals are installed at 4th Avenue East and 8th Street East, the capacity will increase a further 100 vehicles per hour.

By shifting through traffic out of the downtown core via the outer alternative route and by promoting 8th Street and 9th Street as active transportation routes, this should attract those who persons to cycle and walk to the downtown core were previously they would have driven.

Alternative 2 – Multi-Modal Network with Maximum Utility of Existing Infrastructure

Alternative 2, illustrated in **Exhibit 7.2**, includes all measures in Alternative 1, plus improvements to the pedestrian, cycling and transit network. The improvements to the pedestrian, cycling and transit network are listed below:

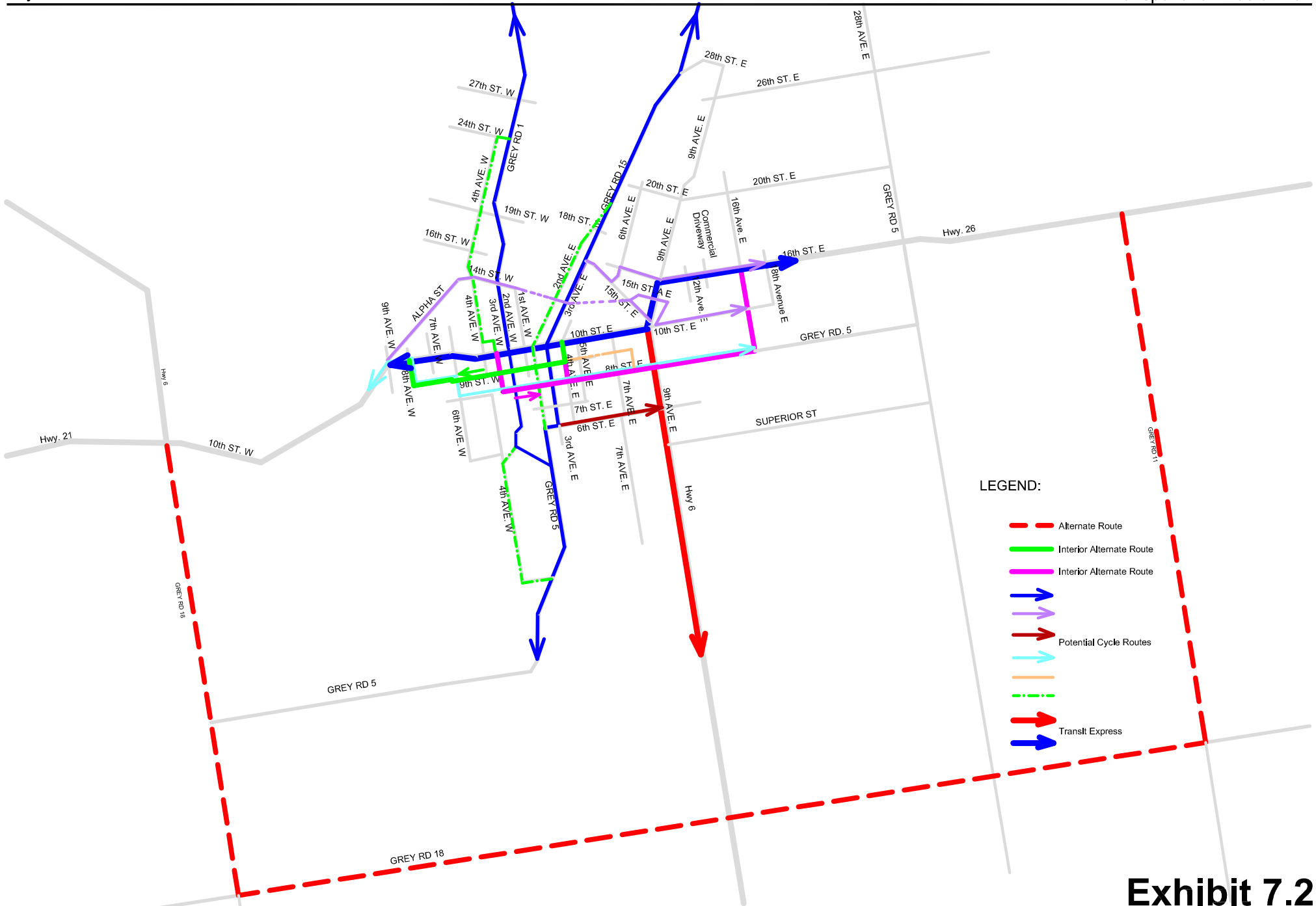
Cycling Routes

A cycle lane spine network is proposed where a north-south and east-west cycle lane network will be established to provide strong cycling connections from existing residential areas to key attractions/generators in the City such as the downtown core, the 16th Street East commercial area, and the east side industrial area. Several options for the cycle lane spine network have been identified. These include:

- North-South Options:
 - 2nd Avenue West / 2nd Avenue East & 3rd Avenue East
 - 4th Avenue West / 2nd Avenue East
- East-West Options:
 - 8th Street East & West / 6th Avenue West / 9th Street West / 8th Avenue West / 10th Street West
 - 9th Street West & East / 8th Street East
 - Alpha Street / 14th Street West / 10th Street East (3a)
 - Alpha Street / 14th Street West / 16th Street East (3b)
 - Alpha Street/ 14th Street West / 15th Street East (3c)
 - 8th Street West / 3rd Avenue East / 6th Street East

One north-south and one east-west option will be selected as the preferred route and will then be upgraded to include the cycle route by providing either a dedicated on-road cycle lane or a pathway located within the boulevard area of the roadway. It is then anticipated that cycle routes into adjacent neighbourhoods will be connected onto the cycle lane spine network to complete the cycling network.

A cycling and pedestrian only crossing at 14th Street West would be required to provide a link for cyclists and pedestrians to cross the harbour if that route is chosen as the preferred route. Bicycle ramps along the stairs on 9th Street East would be required to accommodate the proposed cycling route along 9th Street East.



- LEGEND:
- Alternate Route
 - Interior Alternate Route
 - Interior Alternate Route
 - Transit Express
 - Potential Cycle Routes
 - Potential Cycle Routes
 - Potential Cycle Routes
 - Transit Express
 - Transit Express

Alternative 2 - Multi-Modal Network with Maximum Utility of Existing Infrastructure

Exhibit 7.2



Express Transit Routes and Park and Ride Lots

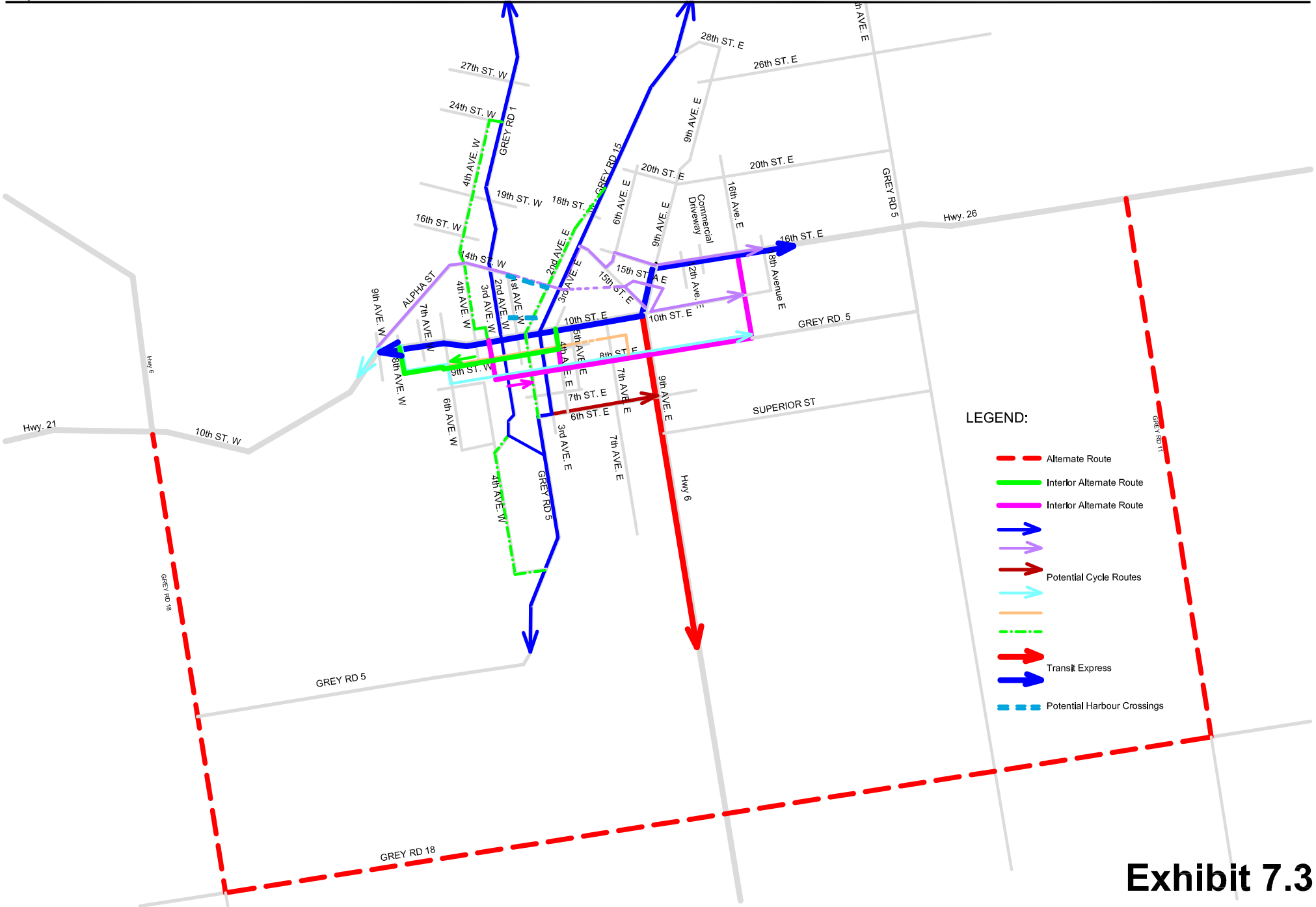
Two express transit routes (East-West and North-South) are proposed to further enhance existing transit service and support proposed travel demand management options including potential Park and Ride lots. Park and Ride lots are recommended to be constructed on the Provincial Highway network at the west, south, and east, and northwest limits of the City. Based on the findings of the origin-destination study it is clear that Owen Sound is the primary destination for travel in the County of Bruce and County of Grey with shopping and work being the two highest trip purposes. The intent of the Park and Ride lots is to provide an alternate means to get to places of work and shopping via transit. These Park and Ride lots will be the origin and destination points for the express transit routes. The East-West Express route will run from a Park and Ride lot on the west side through the downtown core then through the 16th Street commercial area to a Park and Ride lot on the east side. The North-South Express route will run from a Park and Ride lot on the south side of the City to the intersection of 10th Street East and 9th Avenue East where a connection to the East-West Express Route can be made. Each express route will have connection/transfer stops to the existing transit routes at key locations along these routes. It is anticipated that the express routes will serve the popular key destinations of the City with a greater frequency. More details with respect to routing and service levels for these express routes will need to be assessed as part of a future transit service review.

Alternative 3 – Multi-Modal Network with Roadway Expansion

Alternative 3, as illustrated in **Exhibit 7.3**, includes all measures as included in Alternatives 1 and 2, plus a new crossing of the Sydenham River and/or Harbour. There are two potential options for the location of a bridge/harbour crossing - at 11th Street West or 14th Street West.

It is anticipated that the new crossing will redistribute local and a limited amount of through traffic originating from the northwest area of the City to the commercial area along 16th Street East. The intent of the crossing would be to provide additional east-west capacity in the area of the downtown to provide relief to the 10th Street corridor which is expected to have capacity deficiencies in future horizon years through to 2026 and beyond. In addition to providing for additional vehicular capacity it will also provide an additional cycling and pedestrian linkage across the harbour. In some respects this may contribute to greater amenity by making the harbour more of a people place.

The 11th Street West crossing would require a span of approximately 30 metres. It provides connection from the West via 11th Street West from 1st Avenue, 2nd Avenue, and 3rd Avenue West. However, there is only a direct connection to 1st Avenue East on the east side of the river. Access through private property would have to be obtained to gain access to 2nd Avenue East. It is not anticipated that a crossing at this location will interfere with Harbour activities.



Not to Scale

September 2010

Alternative 3 - Multi-Modal Network with Roadway Expansion

Exhibit 7.3

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Project #5454



A crossing along the alignment of 14th Street West would require a span of approximately 110 metres at the southern end of Owen Sound Harbour. It provides direct connections on both sides of the harbour to the existing road network. However, there may be some interference with Harbour activity associated with the storage silos.

Both crossing options are assumed to have a 14m cross-section consisting of two travel lanes, two cycle lanes and sidewalks on both sides. Should this alternative be selected as the preferred alternative solution for Owen Sound further study (Class Environmental Assessment) would be required to select the preferred alignment for the bridge crossing.



Table 7.1: Transportation Alternatives - 2026 Pedestrian, Cycling, Transit, and Roadways

	<u>Do Nothing</u>	<u>Alternative 1</u> Maximize Use of Existing Infrastructure	<u>Alternative 2</u> Multi-Modal Network with Maximum Utility of Existing Infrastructure	<u>Alternative 3</u> Multi-Modal Network with Roadway Expansion
Provincial Highways	No improvements.	Additional signage required.	Additional signage required.	Additional signage required.
County Roads	No improvements.	Additional signage required.	Additional signage required.	Additional signage required.
Arterial Network	Current network.	No widening of arterial roads.	No widening of arterial roads.	A new river/harbour crossing. Potential widening of arterial roads to facilitate connections with the proposed river crossing.
Collector Network	Current network.	Change all-way stop controls to two-way stop control at the intersections of: 9th Street East and 4th Avenue West, 9th Street West at 1st Avenue West, 9th Street West and 3rd Avenue West, 9th Street West and 5th Avenue West, 9th Street West and 6th Avenue West to two-way stop control	Change all-way stop controls to two-way stop control at the intersections of: 9th Street East and 4th Avenue West, 9th Street West at 1st Avenue West, 9th Street West and 3rd Avenue West, 9th Street West and 5th Avenue West, 9th Street West and 6th Avenue West to two-way stop control	Change all-way stop controls to two-way stop control at the intersections of: 9th Street East and 4th Avenue West, 9th Street West at 1st Avenue West, 9th Street West and 3rd Avenue West, 9th Street West and 5th Avenue West, 9th Street West and 6th Avenue West to two-way stop control
Transit Network	Existing level of service.	Existing level of service.	Express Routes along 9th Avenue East to the south, along 10th Street to the west, and along 16th Street to the east.	Express Routes along 9th Avenue East to the south, along 10th Street to the west, and along 16th Street to the east.



	<u>Do Nothing</u>	<u>Alternative 1</u> Maximize Use of Existing Infrastructure	<u>Alternative 2</u> Multi-Modal Network with Maximum Utility of Existing Infrastructure	<u>Alternative 3</u> Multi-Modal Network with Roadway Expansion
Cycling and walking	No investment beyond current levels.	No investment beyond current levels.	<p>Potential cycling lanes for the following routes:</p> <ul style="list-style-type: none"> ▪ North-South Options <ul style="list-style-type: none"> • 2nd Avenue West / 2nd Avenue East & 3rd Avenue East • 4th Avenue West / 2nd Avenue East ▪ East-West Options <ul style="list-style-type: none"> • 8th Street East & West / 6th Avenue West / 9th Street West / 8th Avenue West / 10th Street West • 9th Street West & East / 8th Street East • Alpha Street / 14th Street West / 10th Street East (3a) • Alpha Street / 14th Street West / 16th Street East (3b) • Alpha Street/ 14th Street West / 15th Street East (3c) • 8th Street West / 3rd Avenue East / 6th Street East 	<p>Potential cycling lanes for the following routes:</p> <ul style="list-style-type: none"> ▪ North-South Options <ul style="list-style-type: none"> • 2nd Avenue West / 2nd Avenue East & 3rd Avenue East • 4th Avenue West / 2nd Avenue East ▪ East-West Options <ul style="list-style-type: none"> • 8th Street East & West / 6th Avenue West / 9th Street West / 8th Avenue West / 10th Street West • 9th Street West & East / 8th Street East • Alpha Street / 14th Street West / 10th Street East (3a) • Alpha Street / 14th Street West / 16th Street East (3b) • Alpha Street/ 14th Street West / 15th Street East (3c) • 8th Street West / 3rd Avenue East / 6th Street East



7.2 Evaluation Methodology

The performance and impact of the Do-Nothing scenario and the three transportation alternatives were evaluated using a consistent set of evaluation criteria.

The six evaluation criteria are:

1. Supporting sustainable development,
2. Providing a high level of service through a multi-modal transportation network,
3. Socio-economic impact,
4. Impact on the natural environment,
5. Public support; and,
6. Capital cost.

Table 7.2 shows how each criterion relates to the Problem Statement and which performance indicators were used in the rating of each individual criterion. **Table 7.3** presents the performance of each of the transportation planning alternatives and Do-Nothing scenario set against the evaluation criteria.



Table 7.2: Evaluation Criteria

Criteria	Relation to Problem Statement	Performance Indicators
1. Supporting sustainable development	Meets requirements of growth management strategies defined by the City. Supports land use intensification along transit corridors and other key areas.	Opportunities to support alternative modes of travel.
2. Providing a high level of service on a multi-modal transportation network	Provides for safe and efficient mobility to transit vehicles, passenger cars and trucks, cyclists and pedestrians. Promotes modal integration, supports goals of travel demand management. Meets future travel demand at the acceptable level of service to the extent possible. Protects residential neighbourhoods from traffic infiltration and improves safety.	Three major corridor links at or approaching capacity during 2026 PM peak hour based on 2026 model forecasts. Vehicle kilometres of travel/year during 2026 PM peak hour based on SimTraffic outputs. Percentage of roadways congested during 2026 PM peak hour for the three major corridors based on 2026 model forecasts.
3. Socio-economic impact	Promotes economic viability and recognizes the transportation needs of local businesses. Improves quality of life by reducing congestion Promotes live-work communities.	Cost of congestion, 2026 \$/year during PM peak hour based on SimTraffic total delay.
4. Impact on the natural environment	Minimizes impact on the natural environment by improving air quality and reducing land loss to roadway construction.	GHG emissions 2026 tonnes/year during PM peak hour for the three major corridors based on SimTraffic outputs.
5. Public support	Meets the needs and expectations of the residents of the City of Owen Sound.	Public input received during the course of the Transportation Master Plan; proportion of support for the alternative scenario.
6. Capital cost	Is affordable and has an acceptable cost-to-benefit ratio. Provides funding to all modes of travel including transit, cycling and walking.	Estimated cost of the required infrastructure improvements (\$).



Table 7.3: Analysis of Transportation Planning Alternatives

Criterion	Transportation Planning Alternatives			
	<u>Do Nothing</u>	<u>Alternative 1</u> Maximize Use of Existing Infrastructure	<u>Alternative 2</u> Multi-Modal Network with Maximum Utility of Existing Infrastructure	<u>Alternative 3</u> Multi-Modal Network with Roadway Expansion
Supporting sustainable development	Not supportive, May minimize growth by lowering the attractiveness of the area to residential and industrial investors and the public. Least opportunities to support alternative modes of travel.	Generally not sustainable. Some opportunities to support alternative modes of travel.	More supportive of principles of sustainable transportation planning. More opportunities to support alternative modes of travel.	Somewhat supportive of principles of sustainable transportation planning. Most opportunities to support alternative modes of travel.
Providing a high level of service on a multi-modal transportation network	Percentage of three major corridor links at or approaching capacity during PM Peak Hour => 36%. Total vehicle kilometre of travel at 7,000,000 km/year Average percentage of congested network for the major three corridors (peak direction of travel): 3.3%.	Percentage of three major corridor links at or approaching capacity during PM Peak Hour => 29%. Total vehicle kilometre of travel at 7,360,000 km/year Average percentage of congested network for the major three corridors (peak direction of travel): 1.1%.	Percentage of three major corridor links at or approaching capacity during PM Peak Hour => 18%. Total vehicle kilometre of travel at 7,270,000 km/year Average percentage of congested network for the major three corridors (peak direction of travel): 0.5%.	Percentage of three major corridor links at or approaching capacity during PM Peak Hour => 16%. Total vehicle kilometre of travel at 6,930,000 km/year Average percentage of congested network for the major three corridors (peak direction of travel): 0.5%.
Socio-economic impact	Does not support economic vitality of the City and undermines quality of living. Total annual cost of congestion from PM peak hour of travel within Owen Sound: \$5.9 million/year	Somewhat supportive to economic vitality of the City and limits quality of living. Total annual cost of congestion from PM peak hour of travel within Owen Sound: \$4.6 million/year	Provides additional roadway capacity and is supportive to economic development. Improves quality of life through support of alternative modes. Total annual cost of congestion from PM peak hour of travel within Owen Sound: \$3.9 million/year	Provides additional roadway capacity and is supportive to economic development. Improves quality of life through support of alternative modes. Total annual cost of congestion from PM peak hour of travel within Owen Sound: \$3.5 million/year



Criterion	Transportation Planning Alternatives			
	<u>Do Nothing</u>	<u>Alternative 1</u> Maximize Use of Existing Infrastructure	<u>Alternative 2</u> Multi-Modal Network with Maximum Utility of Existing Infrastructure	<u>Alternative 3</u> Multi-Modal Network with Roadway Expansion
Impact on the natural environment	<p>Greatest impact on natural environment.</p> <p>Total annual GHG emissions produced during the PM peak hour of travel on the three corridors: 25 tonnes/year.</p>	<p>Minor impact on natural environment.</p> <p>Total annual GHG emissions produced during the PM peak hour of travel on the three corridors: 23 tonnes/year.</p>	<p>Minor impact on natural environment.</p> <p>Total annual GHG emissions produced during the PM peak hour of travel on the three corridors: 21 tonnes/year.</p>	<p>Modest impact on natural environment due to proposed crossing.</p> <p>Total annual GHG emissions produced during the PM peak hour of travel on the three corridors: 23 tonnes/year.</p>
Public support	xx% of the comments in support of Do Nothing Alternative.	xx% of the comments in support of Alternative 1.	xx% of public comments in support of Alternative 2	xx% of public comments in support of Alternative 3
Capital cost	No significant capital costs.	Limited costs for traffic direction signs and signage.	Limited costs for traffic direction signs and signage. Moderate costs for roadway improvements to accommodate cycling facilities. Moderate costs for express transit facilities and operations.	Limited costs for traffic direction signs and signage. Moderate costs for roadway improvements to accommodate cycling facilities. Moderate costs for express transit facilities and operations. High cost of new river crossing.

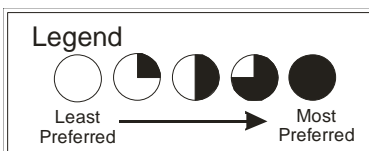


7.3 Evaluation of Alternatives

Table 7.4 shows the preference rating and the results of the evaluation of the planning alternatives. Alternative 2, Multi-Modal Network with Maximum Utility of Existing Infrastructure emerged as the “most preferred alternative” with the highest overall score when assessed using the selected criteria.

Table 7.4: Evaluation of the Planning Alternatives

	Do Nothing	Alternative 1- Maximize Use of Existing Infrastructure	Alternative 2- Multi-Modal Network with Maximum Utility of Existing Infrastructure	Alternative 3- Multi-Modal Network with Roadway Expansion
Supporting sustainable development				
Providing high level of service on a multi-modal transportation network				
Mitigating Socio-economic impact				
Mitigating environment impacts				
Public support				
Capital cost				
Overall				





Based on the evaluation of the alternatives, the recommended long-term transportation strategy for Owen Sound is Alternative 2 – Multi-Modal Network with Maximum Utility of Existing Infrastructure.

The key advantages of the preferred alternative are that it offers the best opportunity to:

- Address the issues at the root cause of the current and future transportation challenges,
- Satisfy County and City growth objectives,
- Encourage alternate travel trips (cycle and transit) while reducing auto trips,
- Minimize congestion and the cost of congestion,
- Support goods movement and access to employment areas; and,
- Support traveller visiting needs.



8. RECOMMENDED LONG-TERM TRANSPORTATION STRATEGY

The components of the recommended transportation strategy are listed below and described in the remainder of this section:

- Land Use and Development
- Transit
- Roads
- Goods Movement
- Walking and Cycling
- Travel Demand Management
- Traffic Calming

8.1 Land Use and Development

Intensification of primary transit corridors and downtown areas has been shown in other jurisdictions to encourage higher transit usage, increased walking and cycling. In turn, it can reduce reliance on auto travel and relieve accompanying traffic pressures. Within the City of Owen Sound opportunities exist for encouraging walking, cycling and transit use through the development along 10th Street, 9th Avenue East and in the downtown core. It is recommended that development planning and design principles incorporate methods identified in the Transit-Supportive guidelines prepared by the Province of Ontario.

Road designs could be updated to accommodate cyclist and pedestrian needs. It is recommended that road design standards be updated to accommodate on-road bicycle lanes and cyclists within the boulevard, and include pedestrian-friendly treatments at intersections and along residential and industrial collector roads. It is recommended that development applications be reviewed to identify requirements of development applications that meet pedestrian and bicycle needs consistent with this plan. Zoning requirements should be reviewed to consider the needs for cycling infrastructure such as required bicycle parking on site.

8.2 Transit

Recommendations for the Owen Sound Transit surface route network would be to undertake a detailed transit service network review which should include the provision of East-West and North-South Express services along the key corridors which support commuter and shopping trips in the City. Accordingly, the recommendations are emphasized to support TDM based ride-sharing initiatives and discourage single-occupancy vehicle travel.



8.3 Roads

8.3.1 Arterial Roads

Recommended improvements to the County and City arterial road network should focus on improving on the available link and intersection capacity, rather than major new infrastructure investment. This includes further investigating and scheduling intersection improvements and directing traffic to corridors with reserve capacity.

This policy recommendation is critical in meeting City's objectives in providing adequate level of service for transit and maximizing transit modal split. In addition, this study recognizes that arterial roads and collector roads are multi-modal corridors that serve cars, transit vehicles, pedestrians, and cyclists. The key recommendations for the road network are summarized below.

- Promote the use of the outer alternate route around Owen Sound for through truck traffic using the County and Provincial highway network.
- Implement traffic control signal timing improvements on 10th Street
- Monitor traffic conditions and implement traffic control signals when warrants are met
- Initiate corridor studies on 10th Street and 16th Street to assess the functional feasibility of intersection improvements (as identified in Chapter 6) and develop a preliminary design with implementation coordinated through the capital program process

8.3.2 Goods Movement

It is recognized that efficient goods movement is an important element of an economically viable region and that maintaining efficient goods movement is an objective of the City of Owen Sound. However, there is a need for a balance between efficient goods movement and maintaining a liveable community and meeting community traffic needs. The following are recommendations to improve the movement of goods and services in Owen Sound:

- Promote the use of the outer alternate routes (using Grey Roads 11 and 18) around Owen Sound for through truck traffic using the County and Provincial highway network.
- Work cooperatively with the County and province in review and design of roads used recommended as the alternate routes.
- Co-operate with the Province of Ontario and Grey County in implementing the use of traffic management tools such as Commercial Vehicle Operations (CVO), Intelligent Transportation System (ITS), and Advanced Traffic Management Systems (ATMS) that provides detection of traffic conditions in downtown Owen Sound and displays conditions at the approaches to the City along Highway 6 and 21 (approaching County Roads 11 and 18).
- Discourage truck traffic through the downtown core on 2nd Avenue East by encouraging truck traffic to utilize north / south through parallel routes such as 3rd Avenue East and 2nd Avenue West.



8.3.3 Traffic Calming

Traffic calming measures are being applied in both new developments and existing neighbourhoods in many Ontario municipalities, as a way to mitigate the adverse impacts of vehicular traffic (such as speeding and high volumes), and to improve the quality of life in the neighbourhoods.

The primary goals in developing a traffic calming policy is to reduce high traffic speeds and decrease through traffic on local roads to acceptable levels to maintain the liveability of residential neighbourhoods, maintain access and mobility of all users of the road allowance, and improve safety for pedestrians and motorists. Where possible, consideration should be given to maintaining or improving the aesthetics of the roadway.

Traffic Calming is seen as part of the City of Owen Sound Transportation Master Plan solution. It may be applicable on certain local roads to manage measured and documented operational problems. The draft Traffic Calming Policy recommended for the City of Owen Sound is provided in **Appendix I** of the Transportation Master Plan Report.

The evaluation of new traffic calming requests is typically coordinated with an annual construction schedule. Based on the typical cost of traffic calming measures, the required consultation efforts, and the staff resources, an overall amount of \$200,000 should be sufficient to complete up to three (3) traffic calming projects per year including the data collection, analysis, design and construction.

The number of traffic calming initiatives undertaken annually will depend on the number of requests received from the public, the merits of these requests, the funding allocated to the Operating and Capital Budgets for traffic calming projects and staff resources available. It is recommended that a list of projects will be maintained and updated annually. Where funding is limited, a phased project implementation plan should be considered.

8.4 Walking and Cycling

Cycling and walking have evolved to become a practical, cost effective, environmentally sensitive and healthy mode of travel for both recreational and utilitarian trips. Both are widely recognized as an integral and necessary part of a community's transportation system as an alternative to motorized travel.

With the exception of freeways, all roads are cycling routes and the design of the road network should recognize the needs of cyclists. It is recognized that most trips involve a component of walking, and increasingly communities are designed to encourage walking and provide safe and pleasant pedestrian facilities. Linking neighbourhoods together through a network of sidewalks, trails and on-road cycling routes will support walking and cycling as viable transportation modes- and essential elements to building healthy communities.



8.4.1 Pedestrian Network

We recommend that the City of Owen Sound should focus their efforts and funding towards the construction of missing links and providing connectivity for the sidewalk network. The feasibility of establishing pedestrian levels of service related to standards for the requirement of sidewalks on one or both sides of the street needs further assessment of the feasibility and cost implications. The ultimate plan for the development of the pedestrian environment will be the gradual completion of the planned pedestrian network shown in **Exhibit 4.8**.

8.4.2 Pedestrian Crossings

The implementation and operation of pedestrian crossings in the City of Owen Sound will need to comply with the legislative context of the Ontario Traffic Act, have regard for best practices in pedestrian accommodation and meet the needs of the City of Owen Sound.

The Highway Traffic Act indicates that when a pedestrian is about to step from the boulevard onto the roadway there are fundamentally two different forms of pedestrian crossing. The crossing may be either / or:

- A controlled crossing where vehicles must yield to pedestrians.
- An uncontrolled crossing where pedestrians must yield to vehicles.

Either form of crossing may be appropriate given the range of pedestrian demand. There is generally a higher degree of concern for pedestrian safety at unprotected crossing points. However, both forms of crossing must be designed to maximize safety. The standard practice for traffic control in Ontario is defined by the *Ontario Traffic Manuals (OTM)*, **Book 12** for traffic signals and **Book 5** for regulatory signs (including stop signs); and is defined by the *2006 School Crossing Guard Guide* document for school crossing guards. The manuals are designed to be used as a guideline by traffic practitioners.

The manuals incorporate current best practices in the Province of Ontario and have recommended thresholds for the implementation of the following protected crossings:

- Traffic control signals at intersections and mid-block
- Pedestrian crossovers (PXOs)
- Intersection pedestrian signals (IPS)
- All-way stop signs
- School crossing guards and school patrollers

A non-protected crossing is a location where there is measurable pedestrian crossing activity, but has no designation or traffic control measures to protect the movement. An unprotected crossing may or may not have warning signage. Some jurisdictions supplement non-protected crossings to improve safety. These additional roadway features either increase driver or pedestrian awareness, or simplify the crossing process.

These features may include:

- Refuge islands and centre medians
- Bulb Outs (Curb Extensions)
- Textured pavement or high-visibility markings



- Standard warning signage or specialize pedestrian signage (e.g. Wait for Gap)
- Above ground Flashing Beacons or in-pavement flashers
- Special Message Signs

The Ontario Traffic Manual Book 15 – Pedestrian Crossings is currently under development. It will provide the framework for implementation of crossing features from which each municipality can develop local policies for features it chooses to implement and the thresholds under which they are warranted.

The City of Owen Sound can proactively monitor the safety of operations at pedestrian crossings to identify hazards and plan mitigation, establish policies that are consistent with accepted engineering practice and sensitive to the local environment, and implement improvements that are consistent with the policies / practices or their underlying principles. Practices should avoid ambiguity that may lead to confusion and misinterpretation of traffic control devices.

From the review of current practices, risk and research into operational characteristics of crossings, the following points have been considered in the development of the pedestrian crossing policy:

- There are operational concerns with PXOs related to the dilemma zone and clearance requirements and there is a trend toward the use of IPS' and a trend away from PXOs amongst Ontario municipalities surveyed. PXO's are not recommended for Owen Sound.
- The implementation of controlled pedestrian crossings (traffic control signals, intersection pedestrian signals and midblock signals) based on OTM warrants and prioritized and implemented through an on-going capital program is a proactive and defensible method of addressing pedestrian needs.
- Given that there is limited statistical research into the operations of IPS', the City of Owen Sound should consider driver workload turning from side streets and potential for vehicle-pedestrian conflicts at any new IPS locations.
- The marking of mid-block uncontrolled crossings with pavement markings are not recommended as they may lead unaware pedestrians or drivers to believe that the crossing is a controlled for pedestrians or lead to inconsistent driver or pedestrian behaviour.
- At mid-block locations, where the adjacent land uses such as high pedestrian generators and trails create high mid-block crossing demand, signage can contribute to driver awareness and pedestrian caution without making the rules of right of way ambiguous for drivers and pedestrians.
- If implementing protected crossing features (IPS') to supplement traffic control signals, they should be done in sufficient quantity such that pedestrians and drivers are familiar with their operation (They may be set up as a pilot project at several (3) potential locations that are in close proximity within a unique localized area.)

It is recommended that the City of Owen Sound proactively address pedestrian safety needs and establish a program of reviews of pedestrian crossings either through on-going traffic operations studies or annual corridor reviews. It is recommended that pedestrian crossing features be implemented where warranted, where environmental conditions are consistent



with other geometric and design requirements, and when funds are available within the City's capital programming process.

It is recommended that the City of Owen Sound reassess its pedestrian crossing policy with regard to recommended pedestrian features upon completion of OTM Book 15. Compliance with pedestrian crossing practices is recommended for regular review including identifying and programming the necessary roadway and traffic control modifications for implementation.

8.4.3 Bicycle Network

The benefits of cycling as an activity and mode of travel are well documented. The development of an active transportation strategy for the City of Owen Sound provides focus and direction in increasing bicycle use and realizing benefits that include:

- Integrating healthy, physical activity into everyday travel, fostering active lifestyles;
- Reducing transportation costs;
- Reducing traffic congestion and carbon dioxide emissions;
- Conserving energy resources; and
- Contributing to a more connected community.

The physical exercise gained from cycling is generally linked with increased health and well-being. Cycling and walking contribute to reduced obesity and can reduce the risk of coronary heart disease, strokes, diabetes and helps manage blood pressure and stress. Walking and cycling can contribute to lower health care costs in the order of \$100 to \$400 per person (Source: National Cooperative Highway Research Program Report 552).

Cycling is a cost effective mode of travel. The cost and maintenance of bicycle ownership is substantially less than a motor vehicle. The annual cost of operating a motor vehicle, including fuel, insurance, maintenance and parking, is between approximately \$8,000 and \$15,000 (Source: Canadian Automobile Association Driving Costs, 2008).

Cycling can be developed and promoted as a viable means of transportation in Owen Sound, helping to address traffic congestion. Opportunities exist through the development of a commuter cycling grid, allowing bicycling to compete with other modes for longer distance commuter travel.

It is broadly recognized that changes in world climate due to Greenhouse Gases (GHG) would influence the functioning of many ecosystems and their member species. Travel accomplished by biking and other active modes that do not generate GHG emissions can be encouraged through the establishment, design, and maintenance of trails and bicycle lanes.

Cycling friendly neighbourhoods can improve the liveability of streets, increasing public presence for safety and security and contributing to the sense of place and belonging. The development of a bicycle network including on-road routes is part of the transportation strategy of the Transportation Master Plan.



8.4.3.1 Network Strategy

In order to support cycling as a competitive mode of travel, there is a need to develop continuous and direct routes to cycling destinations (primary corridors) within the City and to neighbouring municipalities. The public has indicated that a key factor affecting their decision to consider cycling to work is the need for safe and direct routes. The public had indicated a need for well marked cycling “routes, paths, roads” and that there is a need for “more bike friendly designs of streets”.

Primary corridors (trails or arterial and collector roads) provide connections to commercial and employment centres along corridors that are attractive to both recreational and commuter cyclists. Institutional uses, downtown commercial and open space represent key destination areas. Corridors that link these destinations are potential primary corridor, as are links to the industrial areas within the harbor and the eastern portion of the City.

Primary cycling routes are identified in the Official Plan Trail Master Plan. They provide opportunities for commuting along continuous corridors and provide connections key municipal destinations. Key destinations served by the planned routes are identified below.

- Downtown (eg. City Hall, Farmers’ Market, Public Library, Tom Thomson Art Gallery)
- Shopping centres (eg. Heritage Place Shopping Centre)
- Offices such as Grey County
- Institutional uses (including Georgian College, Grey Bruce Regional Health Centre)
- Community uses (eg. Harry Lumley Bayshore Community Centre, Victoria Park)

Secondary cycling routes provide access to community or neighbourhood origins or destinations. The majority of cycling trips in most Ontario Municipalities are short distance trips, the majority of recorded trips are less than 2 kilometres. Typically, the majority of cycling trips are to destinations for leisure purposes within the neighbourhood. Increasing the frequency of shorter community based trips can be encouraged through the provision of new cycling routes within neighbourhoods. This component of the network represents a high potential for increasing cycling activity for all ages and contributes to creating a culture of cycling for future generations.

Secondary cycling routes supplement primary routes. They are the local and collector connections within the neighborhoods. Secondary connections can help to reduce traffic congestion and improve traffic safety around school zones and promote active, healthy living. It is recommended that additional routes be considered in conjunction with the school boards in developing cycle to school / walk to school programs. Objectives include:

- Safe connections to the primary and off-road multi-use trail routes;
- Opportunity to provide a parallel alternative routes to primary routes;
- Provide connections to neighbourhood destinations such as schools; and,
- Promote healthy and active living within communities by providing cycling opportunities.

Implementation of these routes is subject to further detailed assessment of feasibility and the determination of any local safety issues or impacts to operations such as street parking.



8.4.3.2 Parking and Amenities

The provision of bicycle parking and amenities is essential to support the development of cycling as a practical active transportation choice. The fear of bicycle vandalism and theft is common reason given for not riding a bicycle. Bicycle parking, storage and shower / changing rooms and rest areas with benches (collectively called end-of-trip facilities) are important ways to provide convenience and security for cyclists at cycling destinations.

It is recommended that the City of Owen Sound incorporate provisions for bicycle parking within the Zoning By-law. Bicycle parking definitions should also provide guidance on what is not considered as acceptable to qualify as bicycle parking (e.g. storage for an apartment not be within a dwelling unit, on a balcony or in a storage locker). In addition to quantity, minimum space dimensions, definitions of long term and short term parking and the requirement for shower / change facilities should be included within the Zoning By-law.

8.4.3.3 Cycling Network Implementation

An implementation strategy for cycling in Owen Sound is based on the recommendations of this Cycling Plan. To ensure that the Active Transportation Master Plan forms part of the Transportation Master Plan remains valid, a review and update of the plan will occur approximately every five years.

Implementation of these recommendations is projected over a 20 year planning horizon and will include timing, anticipated costing, and life-cycle opportunities of existing road infrastructure. It is recognized that the rate of implementation of the cycling network and the supporting policies and programs will be dependant upon the degree and rate of funding allocated through the City capital programs and external funding sources.

Short, medium and long-range targets for implementation of bicycle routes will be established. The first priorities will include routes that meet one or more of the following criteria:

- Develop a spine network of major north / south and east / west routes;
- Recognize the Downtown as the primary activity centre and destination;
- Connect to other key City destinations;
- Provide cycling route connectivity in cycling routes; and
- Achieve feasible low cost “early wins” to demonstrate successes.

Cycling functional reviews are recommended for each corridor to develop a design consistent with the design guidelines in this document, confirm that traffic and parking impacts are acceptable and ensure that the public is informed and have an opportunity to provide input. Prior to the reconstruction of any roadway identified in the cycling plan noted below, it is recommended that a cycling functional review be implemented.



North-South Route
6 th Avenue West (1 st Street W. to 7 th Street W to Alpha Street)
2 nd Avenue West (6 th Street to 8 th Street)
1 st Avenue West – Eddie Sargent Pkwy (8 th Street W to 22 nd Street W)
West Waterfront (10 th Street W to 22 nd Street W)
East Waterfront – 3 rd Avenue East (10 th Street E to 36 th Street E)
2 nd Avenue East (Harrison Park to 7 th Street E)
4 th Avenue East – 15 th Street East- 5 th Avenue East (Harrison Park to 28 th Street E)
5 th Avenue East (7 th Street East to 10 th Street East)
7 th Avenue East (City Boundary to 10 th Street)
8 th Avenue East (15 th Street East to 23 rd Street East)
16 th Avenue East (8 th Street E to 17 th Street E)
Former CP Railway (8 th Street E to 28 th Street E)
28 th Avenue East (Superior Street to 20 th Street E)
East-West Route
6 th Street – Superior Street (Sydenham River to 28 th Avenue E)
8 th Street West (2 nd Avenue W to 28 th Avenue E)
11 th Street West (Alpha Street to 1 st Avenue W)
Alpha Street (West boundary to 4 th Street West)
16 th Street West (3 rd Street W to 8 th Street W)
15 th Street East – 10 th Street East (4 th Avenue E to Georgian College)
20 th Street East – 17 th Street East (Heritage Place to 28 th Avenue)

To support the network development, it is recommended that the City implement the following:

- Establish a signage (wayfinding) for corridors as the cycling network as route development
- Incorporate bicycle parking requirements for major developments within the zoning by-law
- Establish bicycle parking including covered bicycle parking a key multimodal transfer points and bicycle racks at key community destinations and throughout the downtown

An Active Transportation Plan that the City can implement is attached to the TMP Report in **Appendix H**.



8.5 Transportation Demand Management

Transportation Demand Management (TDM) Programs are being developed in several progressive municipalities and are intended to encourage greater reductions in automobile travel through coordination of alternative modes. For example, transit improvements, pedestrian improvements, and parking policies can have far greater travel impacts and consumer benefits when implemented as a coordinated program.

TDM Programs are typically established by local governments and are spearheaded by the department responsible for transportation services to the community. The program should be ongoing so it provides continual support and encouragement, and responds to future opportunities and changes in individual's travel needs and preferences.

A well managed and properly supported TDM Program can affect a relatively significant portion of total travel. Most programs result in reductions between 10% and 30%. As the City of Owen Sound is a small and relatively isolated community the effects of TDM will be limited. The attainment of a 10% reduction in travel as a result of TDM measures should be considered a great success for Owen Sound.

A TDM program forms part of the overall TMP strategy. The following are the recommendations for TDM measures in Owen Sound.

- Reviewing and modifying transit, cycling and pedestrian-related Official Plan policies to acknowledge their important role in City wide travel demand management.
- Reviewing and modifying site design guidelines, traffic impact study requirements and site plan approval process to encourage applicants to adopt TDM initiatives.
- Development of TDM supportive parking policy such as paid parking, shared parking and other parking management strategies.
- Development of Park and Ride lots located at the edges of the City to encourage transit usages as well as carpooling initiatives.
- Reviewing alternative work schedules at larger employment centres to encourage flexi-time, compressed work week, and staggered shifts to encourage peak travel to/from these employment areas to occur at different times of the days instead of one set time in the morning and one set time in the afternoon.
- Encourage the use of tele-commuting as a substitute of physical travel.
- Encourage the citizens of Owen Sound to be active and have a positive attitude toward reducing car use and relying on alternative forms transportation through promotional efforts.
- A staff position be created to support and manage all pedestrian, cycling, transit and TDM initiatives undertaken by the City to ensure compliance with the various polices and measures being recommended as part of the Transportation Master Plan.



9. IMPLEMENTATION

9.1 Cost Considerations

The timing and implement strategy of recommended road network improvements, pedestrian, cycling, TDM, transit and other support programs is directly related to cost and available budget. Funds will be necessary for the planning, design, property, utility impact mitigation, capital construction/acquisition and on-going operation and maintenance of new transportation infrastructure and services.

Preliminary cost estimates have been identified for identified improvements based on their anticipated need (i.e. short term, medium term, long term). The timing of improvements will be dependant on the City of Owen Sound capital budget approval process.

9.1.1 Short Term Needs

The costs associated with improvements addressing shorter term needs are summarized in **Table 9.1.**

Table 9.1: Solution Cost for Short Term Needs

Capital Works Program Item	Recommendation	Cost
Land Use and Development		
	Planning Department to initiate a Corridor Intensification Study along 10 th Street, 9 th Avenue, and 16 th Street	\$50,000
Transit		
	Undertake Transit Service Review Study	\$50,000
Roads		
	Install larger, overhead street name signs at major signalized intersections (approximately \$1,000 /intersection)	\$15,000
	Install signage directing motorists to use 8 th Street and 9 th Street as an alternative to 10 th Street	\$5,000
	Signal Timing Optimization at: <ul style="list-style-type: none"> ▪ 16th Street at Heritage Place Driveway ▪ 9th Avenue East at 8th Street East 	\$10,000 \$10,000*
	Traffic Signal Installation at: <ul style="list-style-type: none"> ▪ 3rd Avenue East at 15th Street East ▪ 9th Avenue East at 20th Street East ▪ 16th Street East at 6th Avenue East 	\$100,000* \$100,000 \$100,000
	Traffic Signal Modification (Split) at: <ul style="list-style-type: none"> ▪ 9th Avenue East at 10th Street East 	\$10,000
	Intersection Geometric Improvements: <ul style="list-style-type: none"> ▪ 10th Street West and 2nd Avenue West ▪ Add 15m westbound right turn lane ▪ 10th Street East and 9th Avenue East ▪ Modify eastbound lanes from a left turn / shared left-through turn lane / right turn lane to a left turn lane / through lane/ and a shared through- 	\$75,000* \$100,000



City of Owen Sound Transportation Master Plan

Capital Works Program Item	Recommendation	Cost
	<ul style="list-style-type: none"> right turn lane ▪ 6th Street East and 9th Avenue East ▪ To provide north-south opposite left turn lanes 	\$4,000*
TDM		
	Identify potential lands to acquire for commuter parking lots near the northwest, east, west, and south limits of the City.	\$1,000
	Initiate procedure for a staff position be created to support and manage engineering needs including: pedestrian, cycling, transit and TDM initiatives undertaken by the City to ensure compliance with the various polices and measures being recommended as part of the Transportation Master Plan.	\$50,000
Walking and Cycling		
	Installation of sheltered bicycle parking at the Central Transit Station, Heritage Mall, Regional Recreation Centre, Library, Bayshore Community Centre, and City Hall	\$30,000
	Engineering Department to initiate a Pedestrian Crossing Policy	\$15,000
	Initiate EA study to select preferred routing and type of Cycle Lane Spine Network (i.e. on-road, off-road)	\$75,000
Traffic Calming		
	Initiate traffic calming measures at the following locations as recommended in the TMP: <ul style="list-style-type: none"> ▪ Alpha Street ▪ Moores Hill ▪ 15th Street East 'B' 	\$55,000
	Evaluation of traffic calming requests should be coordinated with the annual construction schedule, or twice per year. An overall amount of \$200,000 should be sufficient to complete up to three (3) traffic calming projects per year including the data collection, analysis, design, consultation, staff resources, and construction.	\$145,000
Goods Movement		
	Along with the Ministry of Transportation, Ontario and Grey County, improve signage to advise through truck traffic on Highways 6,10,21 and 26 to use 'Alternate Route'	\$5,000
Total Cost:	City Total	\$816,000
	<i>County Total</i>	<i>\$189,000</i>

*Funding from the County



9.1.2 Medium Term Needs

Recommended improvements to address medium-term transportation needs are summarized in **Table 9.2**.

Table 9.2: Solution Costs for Medium Term Needs

Capital Works Program Item	Recommendation	Cost
Transit		
	Initiate EA study for Express transit service between Park and Ride lots. Study to include route schedules, frequencies, stop locations, and stop facilities such as shelters, pads, and real-time information displays.	\$75,000
Roads		
	Intersection Geometric Improvements: <ul style="list-style-type: none"> ▪ 10th Street West and 2nd Avenue West: <ul style="list-style-type: none"> ▪ Extend westbound right turn lane from 15m to 40m ▪ 10th Street East and 9th Avenue East: <ul style="list-style-type: none"> ▪ Modify eastbound approach to left turn lane / through lane / and shared through-right turn lane ▪ 16th Street East and 9th Avenue East: <ul style="list-style-type: none"> ▪ Add a 50m northbound right turn lane ▪ 16th Street East and Heritage Place Driveway: <ul style="list-style-type: none"> ▪ Add a 75m eastbound left turn lane ▪ 9th Avenue East at 8th Street East: <ul style="list-style-type: none"> ▪ Add a 30m northbound right turn lane 	\$50,000* \$75,000 \$50,000 \$50,000 \$100,000*
	Initiate study to review City wide Street Signage to to inventory all street name signs, and to develop an overall street name sign strategy	\$50,000
TDM		
	Initiate study to review City wide Parking Standards and Fees to encourage alternative transportation modes	\$50,000
Walking and Cycling		
	Initiate construction on Cycle Lane Spine Network starting from Downtown Core and working outwards. Initial corridors for review include 8 th Street, 6 th Avenue West and 2 nd Avenue East	Cost to be determined (TBD) (est. \$1.0 to 1.5 million)
Traffic Calming		
	Evaluation of traffic calming requests should be coordinated with the annual construction schedule, or twice per year. An overall amount of \$200,000 should be sufficient to complete up to three (3) traffic calming projects per year including the data collection, analysis, design, consultation, staff resources, and construction.	\$200,000 Per year
Total Cost:	City Total	\$1,950,000
	<i>County Total</i>	<i>\$150,000</i>

*Funding from the County



9.1.3 Long Term Needs

Recommended improvements for to address long-term transportation needs are summarized in **Table 9.3**.

Table 9.3: Solution Costs for Long Term Needs

Capital Works Program Item	Recommendation	Cost
Transit		
	Undertake update to the transit service review study to determine if any improvements to the transit service are required. Consider possible expansion of routes to include future growth areas in neighbouring municipalities such as Georgian Bluffs and Meaford as well as inter-city transit improvements to outlying Cities such as Barrie and Toronto.	\$50,000
Roads		
	Along with the MTO, and Grey and Bruce Counties develop a detailed travel forecasting auto/transit model. This can included a comprehensive transportation travel survey to be undertaken by all citizens of Grey and Bruce Counties to determine overall travel patterns.	\$100,000
TDM		
	Undertake a review of TDM policies and measures to determine effectiveness of TDM measures	\$50,000
Walking and Cycling		
	Continue outward expansion of Cycle Lane Spine Network including cycle routes that connect to/from the spine network.	Cost TBD est \$1.5 million
Traffic Calming		
	Evaluation of traffic calming requests should be coordinated with the annual construction schedule, or twice per year. An overall amount of \$200,000 should be sufficient to complete up to three (3) traffic calming projects per year including the data collection, analysis, design, consultation, staff resources, and construction.	\$200,000
Goods Movement		
	Initiate a study to develop travel patterns of goods movement within and through the City. This can be used to modify current truck routes, add/remove truck routes, and prohibit through truck traffic through the City.	\$50,000
Total Cost:		\$2,000,000

9.1.4 Administrative Needs

The management of the implementation of the City of Owen Sound Transportation Master Plan will require expertise and efforts beyond current staff levels of service. The implementation will require functional feasibility studies, engineering design and experience in alternative modes of travel. It is recommended that consideration be given to additional transportation engineering support in the form of allocation of staff resources (transportation engineer) or consultant support.



9.2 Infrastructure Cost

The recommended long-term transportation strategy will require an estimated \$5 million in capital projects and engineering studies. Additional costs will be associated with the administration, operation and maintenance of these improvements. Transit related costs will be determined through a separate Transit Strategy Study.

9.3 Funding Sources

Improvements to arterial roads and collector roads are under the jurisdiction of the City of Owen Sound. Improvements triggered by growth within the City are eligible for funding through City of Owen Sound Development Charges (DC) and Capital Program. It is recommended that the City develop/ update a development charge by-law to reflect the costs of identified improvements.

Expansion of pedestrian facilities, cycle paths and travel demand management services should be included in future development charge updates. Recognizing constraints on capital and operating budgets, alternative funding sources will be investigated. The following sections identify opportunities for federal, provincial, and third party funding sources. Below is a list of possible financial resources available to implement the Master Plan:

- Bicycle Trade Association of Canada
- Health Canada Grant/Contributions Program
- Ontario Cycling Association and International Mountain Biking Association
- Gas Tax Contributions
- Federal Government
- Ontario Transportation Demand Management Municipal Grant Program
- Provincial Government dedicated funding
- TD Friends of the Environment
- Shell Environment Fund
- Environment Canada – EcoAction Community Funding
- Trillium Foundation
- Communities in Action Fund
- Moving on Sustainable Transportation (MOST) program
- Developers or affected businesses

In order to make use of available external funding, the City of Owen Sound will need to develop projects within the scope of the master plan that are ‘shovel ready’.

9.4 Plan Maintenance

The goal of the OS-TMP study is to outline a long-term plan for the transportation system in response to a changing socio-economic, fiscal and political environment. In particular, the recent provincial and municipal initiatives regarding land use intensification – including the Provincial Policy Statement. To ensure that the transportation master plan stays current and is fully coordinated with planning policies, it is recommended that the Owen Sound Transportation Master Plan be:

- Reviewed upon the completion of an Owen Sound Official Plan update to ensure conformity with the OP; and
- Subject to a comprehensive update no more than five years after an OP update.