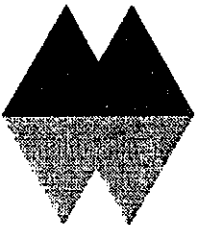
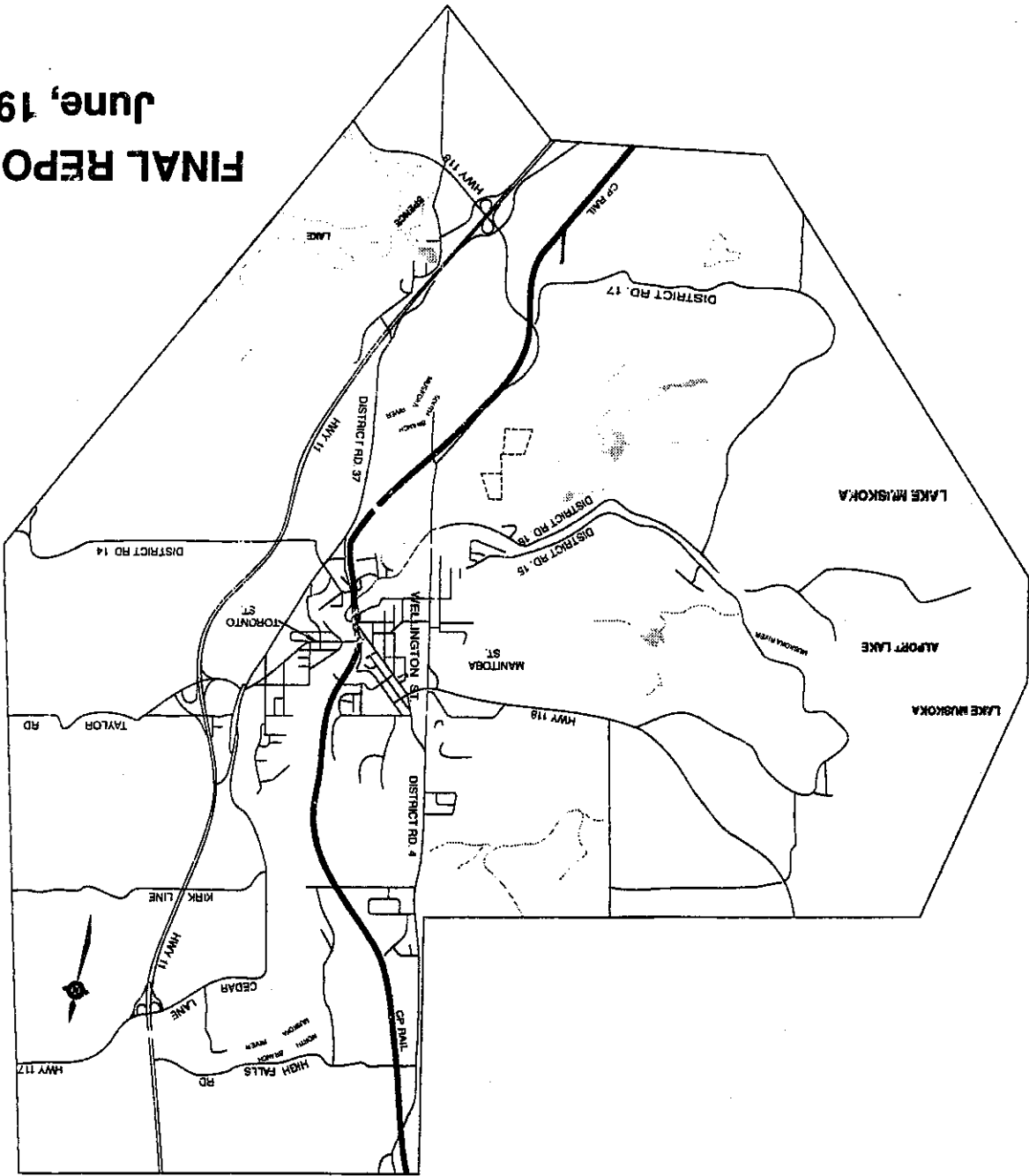


# FINAL REPORT June, 1994



**Town of Bracebridge  
TRANSPORTATION STUDY**



# **TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY**

## **PREAMBLE**

May, 1994

On January 19, 1994 the Council of the Area Municipality of the Town of Bracebridge considered the recommendations contained in the Town of Bracebridge Transportation Study prepared by Totten Sims Hubicki dated March 1993 (Draft Report). The Town's position is as follows:

### • **Table A - Recommended Improvements**

That the Town endorses the recommendations applying to the District Municipality of Muskoka and the Ministry of Transportation and supports the recommendations applying to the Town with the following qualification:

3.0 (B) West Arterial Route - That the Town supports the concept of a west arterial route but on the condition that the final route alignment be determined through the more detailed Environmental Assessment process (Route Location Study) to be undertaken as soon as possible by the Ministry of Transportation of Ontario. The Official Plan document would be amended as part of this process to designate the selected transportation corridor.

There are other viable alternatives for the west arterial route that do not impact on approved development projects including the Royal Muskoka and these should be the primary focus of the Environmental Assessment. The Royal Muskoka approvals will proceed on the basis of a local municipal road only. The Environmental Assessment process would have to recommend and account for any development approvals in effect and actual development on a ground.

### • **Text Recommendations 1 to 14**

That the Town endorses the recommendations applying to the District of Muskoka and the Ministry of Transportation of Ontario and supports those applying to the Town with the following qualifications recommended.

Recommendation No. 2 - Main Street, Hiram Street, McDonald Street - The Town shall recognize this corridor as an alternate route to Manitoba Street for all classifications of traffic (remove truck route designation reference).

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- A new Water Treatment Plant and ancillary facilities, which is currently under design, will open up new areas of development within the Town;
- There are a number of development applications, in various stages of review, for lands within the urbanized area of the Town; consequently, there is a need to identify "local" and "regional" transportation requirements that may be needed to service existing and development related traffic. It is fundamental in cases of major developments that property be protected to ensure that an adequate future transportation network can be provided. Currently, there is a major development proposal for the old Magna Lands in the south-west quadrant of the Study Area under consideration. Some of the lands within these lands now known as Royal Muskoka may be required to provide a roadway link which would act as a connection between Highway 11 and Highway 118 west; it is considered prudent to confirm the need for a link in this area and to protect any property that may be required, even though such a link may not be required for a number of years;
- The Ministry of Transportation of Ontario (MTO) has completed a Planning Study along Highway 11. This work may result in Highway 11 being classified as a controlled access highway adjacent to the urbanized area of the Town. Such a designation will ultimately result in the elimination of the existing at-grade intersection with District Road 37. It was recommended in the Ministry's Study that an interchange be provided at District Road 37 which would consequently have an impact on the District and Town roadways. Given the potential impact on Town and District roadways with the construction of an interchange at District Road 37, it was considered important to review the proposed location of this interchange on Highway 11 and to determine from a Town and District perspective, if the optimum location for such a facility has been selected; and
- There is a need to address truck traffic problems within the Study Area and in particular, within the urbanized area of the community. The existing geometrics of the road network and associated intersections within the Study Area makes it difficult for truck traffic as well as passenger vehicles and pedestrians to manoeuvre safely and efficiently within the Town.

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

EXHIBIT No. A  
RECOMMENDED ROADWAY  
NETWORK FOR YEAR 2011

NOT TO SCALE

- NEW RIVER CROSSING
- NORTH & WEST ARTERIAL ROUTE
- PROPOSED NEW INTERCHANGE
- ▲ NEW RAILWAY GRADE SEPARATION
- //// REALIGN FRASERBURG RD. WEST OF HWY 11
- - - STUDY AREA

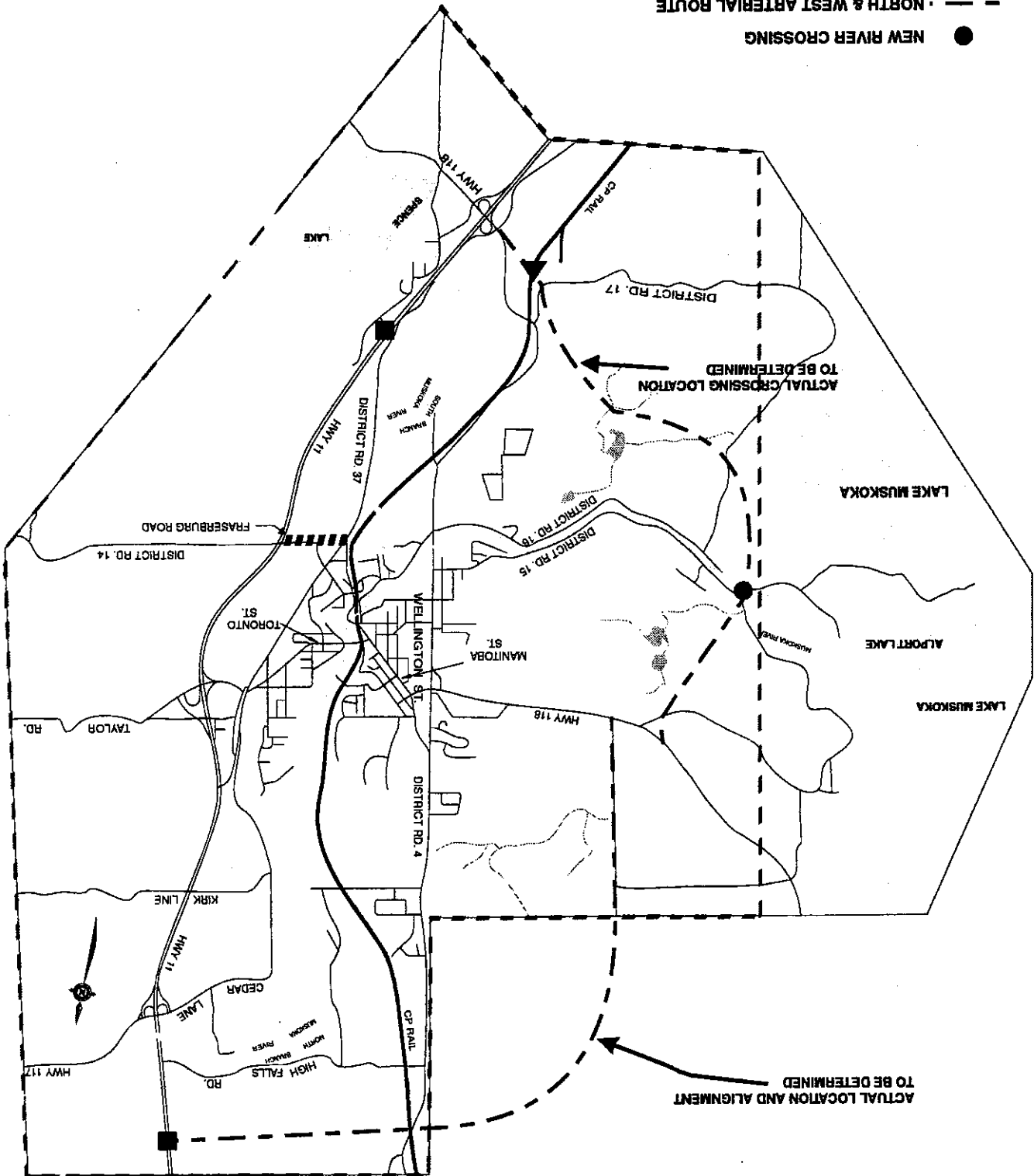


Table A

**Town Of Bracebridge Transportation Study  
Recommended Improvements**

| Location and Recommendations                                                                                                                                                                                                                                               | Date Required | Estimated Cost<br>(1994 \$) | Comments                                                                                                                         | Text Reference         | Jurisdiction  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|
| <b>1.0 INTERSECTIONS</b>                                                                                                                                                                                                                                                   |               |                             |                                                                                                                                  |                        |               |
| 1.1 Manitoba Street/Monck Road<br>(a) Signal timing revision.                                                                                                                                                                                                              | NOW           | 500                         |                                                                                                                                  | 5.1, 5.3, 6.1          | District      |
| 1.2 Manitoba Street/Dominion Street<br>(a) Implement a Northbound to Westbound left turn restriction                                                                                                                                                                       | NOW           | 1000                        |                                                                                                                                  | 5.3, 6.2.1             | District      |
| 1.3 Manitoba Street/Ontario Street<br>(a) Install traffic signals                                                                                                                                                                                                          | 2001          | 70,000                      | Signal warrant analysis is required to confirm the need                                                                          | 5.1, 6.2.1             | District/Town |
| 1.4 Wellington Street/Beaumont Drive<br>(a) Construct N/B and S/B left turn lanes                                                                                                                                                                                          | Now           | 46,000                      |                                                                                                                                  | 5.1, 6.1.3             | District      |
| <b>2.0 ROADWAY LINKS</b>                                                                                                                                                                                                                                                   |               |                             |                                                                                                                                  |                        |               |
| 2.1 Wellington Street<br>(a) Construct a centre two-way turning lane on Wellington Street from the Wellington Street Bridge to Highway 118                                                                                                                                 | 1993/94       | 340,000                     | A detailed design study will be required prior to implementation                                                                 | 5.3, 6.2.2, 7.4.1, 7.5 | District      |
| 2.2 Traffic flow in the following school areas should be monitored on a regular basis to ensure public safety:<br><br><ul style="list-style-type: none"> <li>- Cedar Lane</li> <li>- Balls Drive</li> <li>- Wellington Street North</li> <li>- District Road 14</li> </ul> | NOW           | N/C                         | Schedule B Class Environmental Assessment required.<br><br>Specific attention should be given to speed limits and proper signage | 5.3, 6.6               | Town/District |

Table A Continued

Table A Cont'd

**Town Of Bracebridge Transportation Study  
Recommended Improvements**

| Location and Recommendations                                                                                                                             | Date Required | Estimated Cost<br>(1994 \$) | Comments                                                       | Text Reference                             | Jurisdiction      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|----------------------------------------------------------------|--------------------------------------------|-------------------|
| <b>3.0 ALTERNATIVE NETWORK IMPROVEMENTS</b>                                                                                                              |               |                             |                                                                |                                            |                   |
| (a) Construct North Arterial Route as a 2-lane rural road.                                                                                               | Beyond 2011   | 6,900,00                    | Cost include construction of Bridge(s), Railway Interchange(s) | 7.2, 7.3.1, 7.3.2, 7.4.2, 7.5, 10.0        | MTO/District/Town |
| (b) Construct West Arterial Route as a 2 lane rural road.                                                                                                | 2011          | 18,700,00                   |                                                                | 6.2.2, 7.2, 7.3.1, 7.3.2, 7.4.1, 7.5, 10.0 | MTO/District/Town |
| (c) Construct a new interchange at Hwy 11/District Road 37                                                                                               | 1996          | 4,830,000                   |                                                                | 7.2, 7.3.1, 7.3.2, 7.4.3, 7.5              | MTO               |
| (d) Realign Fraserburg Road W. of Hwy 11 to rectify Horizontal and Vertical alignment deficiencies.                                                      | NOW           | 1,100,000                   |                                                                | 7.3.1, 7.5                                 | District/MTO      |
| <b>4.0 ALTERNATE DOWNTOWN ROUTES</b>                                                                                                                     |               |                             |                                                                |                                            |                   |
| (a) Implement an alternate truck route utilizing the Main Street/Hiram Street link                                                                       | NOW           | 5,000                       | Cost includes signing and pavement marking only                | 5.2, 5.3, 6.2.1, 6.3                       | Town              |
| <b>5.0 PARKING</b>                                                                                                                                       |               |                             |                                                                |                                            |                   |
| (a) Enforce parking regulations to promote efficient use of existing parking facilities.                                                                 | NOW           | N/C                         |                                                                | 4.5                                        | District          |
| <b>6.0 SIGNING AND PAVEMENT MARKING</b>                                                                                                                  |               |                             |                                                                |                                            |                   |
| (a) Town and District should undertake a sign inventory to ensure all existing traffic signs and pavement markings are in compliance with MTO standards. | NOW           | N/C                         | Required for budgeting, maintenance and legal reasons.         | 4.6, 6.4, 6.5                              | Town/District     |

Notes: N/C - Not Costed

Cost Estimates Do Not Include Property Costs.

Costs are in 1994 Uninflated Dollars

2. In order to rectify problems relating to local and non-local truck traffic within the downtown area, and in particular at the intersection of Manitoba Street and Thomas Street, the following strategy is recommended:

- The Town should designate a truck route which involves the use of Main Street, Hiram Street and McDonald Street to provide an alternate route to Manitoba Street between Monck Road and Thomas Street. This route should be designated through the use of the appropriate informational signing. In order to provide an improved facility for truck and auto traffic, it is recommended that the Town of Bracebridge in conjunction with the District Municipality of Muskoka undertake a Functional Design Review to determine if any geometric improvements are required along this route.

3. The District of Muskoka should initiate a Schedule Class Environmental Assessment for the widening of Wellington Street from the Wellington Street Bridge to Monck Road. If approved, this should be followed by a detailed design study. The roadway should be widened to provide a two-way centre left turn lane.

4. The need for additional north-south and east-west arterial roadway capacity has been confirmed for the community. There is sound justification for the Town, District and MTO to proceed with preliminary design, and ultimately completion of Environmental Assessments (Route Planning Studies) and construction for these facilities. Specifically, and in order to confirm the location of future roadway links within the Town of Bracebridge and to ensure that property can be adequately protected, it is recommended that additional studies be undertaken for the following facilities:
  - The proposed westerly arterial route from Highway 11 to Highway 118 West;
  - The proposed northerly arterial route from Highway 11 to Highway 118 West;

Environmental Assessment or Route Planning Studies should be undertaken for both of these facilities. Future Studies should deal with the following basic issues:

- Confirmation of need and justification;
- Natural and social environmental considerations;
- Identification of right-of-way requirements, and
- Economic assessment of the impact of such a facility on businesses in the Town.

Future Studies should again review all alternatives to the provision of additional north-south and east-west arterial roadway capacity in the area.

It is fundamental to recognize that, without an approved Environmental Assessment Study, property cannot be *actively* pursued for any of the above new roadway facilities. Property can, however, be obtained on an opportunity basis, i.e. the owner sells the property to the proponent (roadway authority) or the property is obtained through the development or re-development process. It should also be recognized that Class Environmental Assessments for municipal road projects currently have a "shelf life" of approximately 5 years. A similar "shelf life" exists for Provincial Route Planning Studies. Environmental Assessment Studies could be conducted as part of the development and the review process. This could be applicable in the case of the proposed Royal Muskoka Development in the south-west portion of the community.

5. Arising from a review of potential interchange alternatives on Highway 11, it is recommended that Fraserburg Road between Highway 11 and District Road 37 be realigned and reconstructed as shown in Exhibit 15. Responsibility for upgrading Fraserburg Road should be shared by the District Municipality of Muskoka and MTO. It is also recommended that preliminary and detail designs be initiated by the District and MTO. This project will likely be a Schedule B Class Environmental Assessment.

6. The Town of Bracebridge should maintain and update the technical data provided as part of this report by initiating a regular traffic count program in conjunction with the District Municipality of Muskoka. Major intersection and roadway links should be counted and assessed as recommended in the text.

7. The Town of Bracebridge and the District Municipality of Muskoka should require that Traffic Impact Studies be submitted in conjunction with all development applications consistent with the guidelines proposed in Section 11.0 of this report.

8. Enforcement of on-street parking restrictions in the downtown area, particularly around the intersection of Manitoba Street and Thomas Street should continue to be a high priority for the District Municipality of Muskoka. Both illegal parking and some double parking was observed in the area of the intersection. These conditions significantly affect capacity at the intersection and also hinder turning movements for larger vehicles.

9. The Town of Bracebridge and the District Municipality of Muskoka should ensure that the transit guidelines detailed in the text of the report are incorporated into the assessment and/or design of future subdivision or developments in the municipality. All development applications should be reviewed by staff responsible for transportation planning in the Town.

10. The District Municipality of Muskoka in conjunction with the Town of Bracebridge and MTO should consider the undertaking of a Transit Study to initiate plans for future implementation of a transit system within the area. The Terms of Reference for such a study should require that the following issues be addressed:

- Identification of service area and development of ridership projections;
- Identification of system alternatives:
  - Public operation;
  - Private operation; and
  - Para-transit service, etc.
- Vehicle requirements;
- Identification of an implementation timetable;
- Identification of system operating parameters including the type of service to be offered, i.e. conventional versus para-transit;
- Completion of economic analysis;
- Management structure; and
- Potential routes, terminals, etc.

Although implementation of a transit system may not be immediately imminent, it would be appropriate to ensure that all future development planning is conducted with the possible implementation of a transit system in mind.

11. As a pedestrian or bicycle route system forms an integral part of the Town of Bracebridge and the District Municipality of Muskoka should undertake a study to identify a definitive pedestrian and cycle network incorporating recommendations from the Town of Bracebridge Transportation Study. Included within the context of a review of the pedestrian and cycle network should be a review of the possibility of combining snowmobile routes in the community with possible pedestrian and cycle routes. The future plan resulting from the above review should be used to provide guidance to developers and in the assessment of future development applications. The Town and District should encourage bicycle and pedestrian routes linking green spaces and providing access to major activity and employment centres.

When considering the construction or reconstruction of roads and bridges, the Town and District should investigate and provide for bicycle lanes wherever possible. As a condition of approval of site plan applications, the Town and/or the District should require the provision of bicycle storage space and facilities.

12. Where necessary, the Official Plans for the appropriate municipality should be amended to reflect the future transportation requirements depicted in this document.

13. The Town of Bracebridge should consider the appropriate amendments to the Town's Traffic Bylaw to permit the designation of "Truck Routes" within the Town.

14. A Transportation Planning Study *update* should be undertaken within the Town of Bracebridge every five years to ensure that changes in local demographics and traffic patterns can be regularly addressed. In order to facilitate such an update, population and employment data should be maintained and updated on a regular basis.

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

The Town of Bracebridge is located within the District Municipality of Muskoka and serves as a focal point for cottage country areas centred around Lakes Muskoka, Rosseau and Joseph. During the summer months, there is a considerable amount of tourist traffic that travels into and/or through the Bracebridge area. Currently, the local road network requires that a majority of vehicle trips destined for this Bracebridge area, including those trips bypassing the Town, must travel on the internal roadways within the Town's urban area. The combination of tourist and local travel demands have resulted in congested operating conditions during the weekday/weekend peak period, particularly on roadways in the Central Business District (CBD) of the Town. Further additional development within the community will only exacerbate capacity restrictions on the local road network.

Based on field studies and visual observations of local traffic conditions, it can be firmly concluded that undesirable operating conditions are most prevalent during the period between May to October. During the months between October to May, a number of the concerns and issues relating to traffic congestion are not as prevalent due to reduced volumes of tourist/recreational traffic throughout the area.

There are several potential developments at different stages of the approval process that will generate additional traffic demands on the existing network within the Study Area. Although several Traffic and Parking Studies have been undertaken within the Town over the last 10 years, resulting in some operational and physical improvements, the Town of Bracebridge, the District Municipality of Muskoka and the Ministry of Transportation of Ontario (MTO) have recognized the need to undertake a Transportation Planning Study

which will review existing operational problems, evaluate the existing transportation system and determine future system requirements. The purpose of such a Transportation Planning Study is to identify a "long-term" strategic transportation plan addressing the traffic demands associated with future development in the area. The decision to initiate a Transportation Planning Study resulted from the following considerations:

- The urbanized section of the Town is currently experiencing existing operational problems, particularly during the summer months; this situation will only be exacerbated with continued growth in travel demand;

- A new Water Treatment Plant and ancillary facilities, which are currently under design, will open up new areas of development within the Town;

- There are a number of development applications, in various stages of review, for lands within the urbanized area of the Town; consequently, there is a need to identify "local" and "regional" transportation requirements that may be needed to service existing and development related traffic. It is fundamental in cases of major developments that property be protected to ensure that an adequate future transportation network can be provided. Currently, there is a major development proposal for the old Magna Lands in the south-west quadrant of the Study Area under consideration. Some of the lands within this Royal Muskoka property may be required to provide a roadway link which would act as a connection between Highway 11 and Highway 118 west; it is considered prudent to confirm the need for a link in this area and to protect any property that may be required, even though such a link may not be required for a number of years;

- The Ministry of Transportation of Ontario (MTO) has completed a Planning Study along Highway 11 in the area of the Town. This work may result in Highway 11 being classified as a controlled access highway adjacent to the urbanized area of the Town. Such a designation will ultimately result in the elimination of the existing at-grade intersection with District Road 37. It was recommended in the Ministry's Study that an interchange be provided at District Road 37 which would consequently have an impact on the District and Town roadways. Given the potential impact on Town and District roadways with the construction of an interchange at District Road 37, it was considered important to review the proposed location of this interchange on Highway 11 and to determine from a Town and District perspective, if the optimum location for such a facility has been selected; and

- There is a need to address truck traffic problems within the Study Area and in particular, within the urbanized area of the community. The existing geometrics at some key intersections within the Study Area make it difficult for truck traffic as well as passenger vehicles and pedestrians to manoeuvre safely and efficiently.

The Town of Bracebridge in conjunction with the District Municipality of Muskoka and the Ministry of Transportation of Ontario (MTO) retained Totten Sims Hubicki Associates (1991) Limited to undertake the Transportation Planning Study.

The product of this Study is a "long-term" strategic plan which can be implemented over a 20 year planning horizon. The plan involves transportation systems and traffic operations improvements which will provide for more efficient use of the existing roadway system and ensure that future traffic demands can be accommodated on roadways within the Town of Bracebridge.

## **1.2 STUDY AREA**

For the purpose of this Study, the established Study Area includes the urbanized portion of the Town of Bracebridge, the Highway 11 corridor from District Road 4 to north of Highway 117 and that portion of the Town extending from the urbanized area to Lake Muskoka. Identified on Exhibit 1 is the Study Area considered within the context of the Town of Bracebridge Transportation Study.

## **1.3 STUDY GOAL AND OBJECTIVES**

The primary goal of the Study was to maximize the effectiveness of the existing transportation system and to provide recommendations and an implementation plan that would address the existing deficiencies and future transportation needs associated with residential, commercial/industrial and recreational growth within the Study Area.

In order to satisfy the goal of the Study, the following objectives were established:

- Maximize the effectiveness of the existing transportation system through an assessment of existing operational problems and recommendations of cost effective Transportation System Management (TSM) improvements;
- Identify future travel demands (2011) on roadways within the Study Area and recommend operational and/or physical improvements to satisfy future demands;
- Identify a "practical" program for implementation of TSM improvements;
- Identify actions required to protect future infrastructure requirements;
- Identify additional transportation measures that can be taken to defer the need for major infrastructure improvements and/or ensure that the impact of future development is properly mitigated from a demand, operational and safety perspective; and



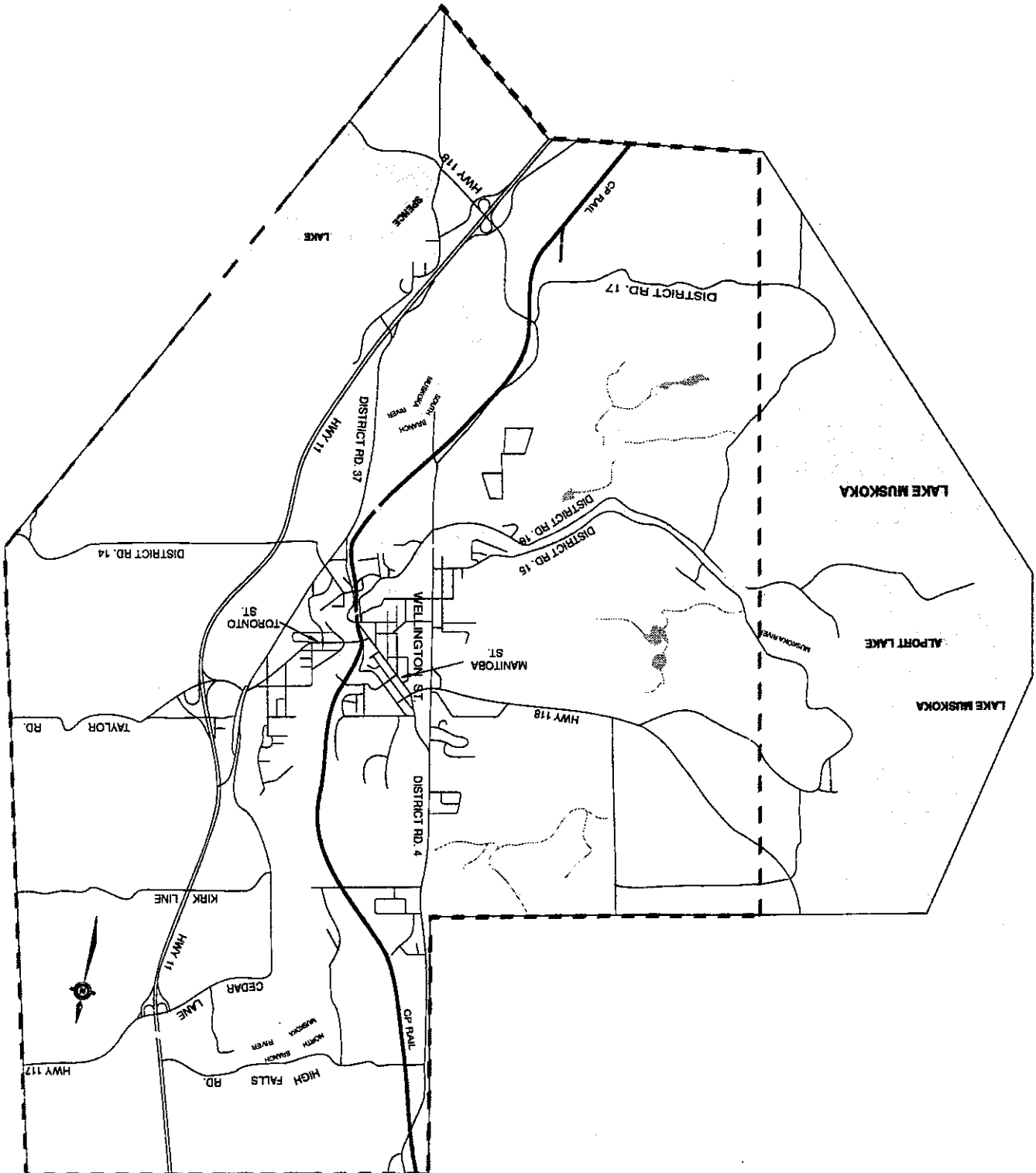
# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

EXHIBIT No. 1

STUDY AREA

--- STUDY AREA

NOT TO SCALE



- The Study must recognize the inherent relationship between land use and transportation. The Study must also recognize the impact that potential new facilities may have on the existing roadway network and community amenities.

It is recognized that the above objectives are somewhat general in nature; outlined below are specific issues that were addressed as part of the Town of Bracebridge Transportation Study:

#### **A. Traffic Operations**

- Consideration of significant variations in traffic volumes between summer and winter (i.e. average annual) conditions;
- Consideration of traffic problems and identification of "interim" and "long-term" solutions to these concerns;
- Identification of "accident prone" locations;
- Review of access to major traffic generators;
- Revisions to signal timing and phasing plans at signalized intersections; and
- Identification of any major deficiencies, including traffic control devices, substandard intersection geometry and identification of measures to mitigate existing operational problems.

#### **B. Transportation Planning Issues**

- Assessment of the capacity of existing river crossings and as required, identification of the need for additional or relocated crossing capacity;
- Identification of the future population and employment projections for a 20 year planning horizon;
- Generation of traffic volumes associated with future development;

- Identification of future travel patterns/desires;
- Assessment of future volumes on the existing and future road network;
- Identification of the need for future alternative arterial roadway links connecting Highway 11 to Highway 18 west of Bracebridge on both the north and south sides of the urbanized area;
- Assessment of "interim" measures to enhance existing routes through the Town including roadway and intersection or signing improvements;
- Prioritization of recommended improvements;
- Assessment of the existing public transportation system and determination of the need for future service improvements;
- Assessment of existing public transportation amenities including bicycle paths, pedestrian walkways and transit amenities and identification of future potential improvements;
- Evaluation of the need for and location of interchange connections with Highway 11; and
- Identification of future roadway jurisdictions and mechanisms for changing any jurisdictions, if required.

#### 1.4 STEERING COMMITTEE

The Study was conducted under the direction of the Steering Committee composed of the following representatives of the Town of Bracebridge, the District Municipality of Muskoka and the Ministry of Transportation of Ontario (MTO):

|                    |                                  |
|--------------------|----------------------------------|
| Mr. Ron Walton     | Town of Bracebridge              |
| Mr. Peter Neice    | Town of Bracebridge              |
| Mr. Noel Waters    | District Municipality of Muskoka |
| Mr. Jim Green      | District Municipality of Muskoka |
| Mr. L.E. Authier   | MTO (Huntsville)                 |
| Mr. Henry Herbrand | MTO (North Bay)                  |
| Mr. Dave Winkworth | MTO (Downsview)                  |

## 2.0 STUDY METHODOLOGY

As previously discussed, the Study involved an assessment of both traffic operations and transportation planning issues. The traffic operations and transportation issues are interrelated and it was determined that solutions to operational problems, although perhaps "short-term" in nature, must be compatible with any "long-term" system improvements which may be recommended. In basic terms, the Study involved the following major activities:

- Data collection and analysis;
- Analysis and assessment of current traffic operations and recommendation of operational improvements;
- Identification of future population and employment projections within the Study Area;
- Assessment of future travel demands relating to potential demographics and identification of future transportation requirements; and
- Development of an implementation program and cost estimate for both operational and physical improvements.

In the undertaking of the above tasks, every effort was made to ensure that all recommended traffic operations and planning strategies were responsive to local requirements. As such, TSH calibrated all parameters to be used in the traffic and transportation planning analysis to ensure that any recommended improvements reflect actual conditions in the Study Area.

As part of this Study, it was also considered fundamental to obtain comments from residents and representatives of local businesses with respect to traffic issues within the community. Consequently, public input was solicited through placement of ads in the local newspaper. In addition, interviews of local citizens and representatives of local businesses were conducted to obtain input on problems and proposed solutions. No responses were obtained from the newspaper advertisement.

### 3.0 THE EXISTING TRANSPORTATION SYSTEM

#### 3.1 ROAD NETWORK

Shown on Exhibit 2 is the existing road network within the Study Area and the appropriate roadway classifications. Shown on Exhibit 3 are the existing roadway jurisdictions and signalized intersections within the Town of Bracebridge. Currently, there are five (5) signalized intersections within the Town.

The type and location of signalize control equipment at all intersections, generally meets the requirements of MTO's Manual of Uniform Traffic Control Devices (MUTCD) (e.g. signal heads, pedestrian heads, backboards). All signing at the intersections appears to be in good condition and in accordance with MUTCD. A detailed review of signal equipment and operations was not conducted as part of this Study. It is our understanding, based upon discussion with staff of the District, that state-of-the-art solid state controllers are in operation at all locations.

#### 3.2 TRANSIT SERVICE

The Town of Bracebridge does not currently operate a conventional municipal transit service during the summer months. The Town does, however, provide transit service between a stop or terminal located at the intersection of Ontario Street and Manitoba Street and the commercial/retail areas located on Monck Road (District Road 37) west of Wellington Street. This service is provided by a single low capacity replica vintage vehicle and, based upon our discussions with Town staff and riders, it appears that the service is used mainly by tourists to the area.



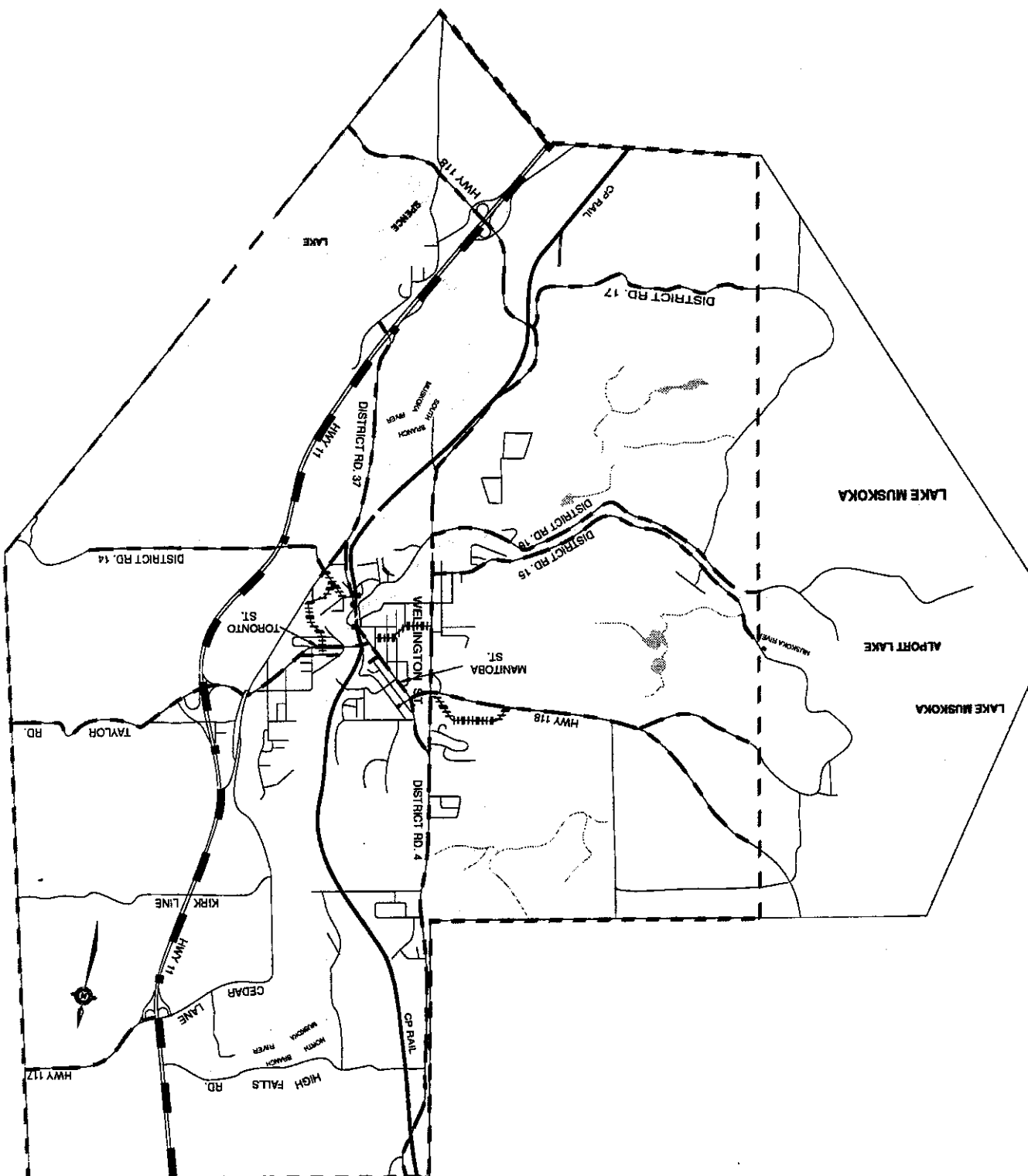
TOTTEN SIMS HUBICKI ASSOCIATES  
ENGINEERS, ARCHITECTS AND PLANNERS

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

CLASSIFICATIONS FOR EXISTING  
ROADWAY NETWORK  
EXHIBIT NO. 2

■ FREEWAY  
— ARTERIAL  
- - - COLLECTOR  
- - - STUDY AREA

NOT TO SCALE



### **3.3 PEDESTRIAN, BICYCLE AND OTHER PUBLIC AMENITIES**

The Town of Bracebridge has not designated an official pedestrian or bicycle route system within the community, although the importance of such a plan, is recognized by Town and District staff. There is a recognized snowmobile route system within the community which is depicted in general fashion on Exhibit 4.

Snowmobile routes within the region are operated and maintained by two organizations which belong to the Ontario Federation of Snowmobile Clubs. The Muskoka Snowmobile Sno Bombers and the Happy Wanderers Snowmobile Club. The Muskoka Snowmobile Region publishes a snowmobile route map for the area. Discussions with representatives from the Muskoka Snowmobile Region and the Ontario Federation of Snowmobile Clubs revealed the following concerns with respect to maintenance and future designation of snowmobile routes in and around the Bracebridge area:

- Snowmobiling represents a major portion of the winter economy within the Muskoka area;

- It is considered essential that the existing trails be maintained and that future trails be planned to ensure practical expansion of the network; and

- With respect to the design of transportation facilities, special accommodation should be made for snowmobiles through the provision of the appropriate

protection adjacent to roadways and crossing facilities particularly in the area of major highways and District roads.



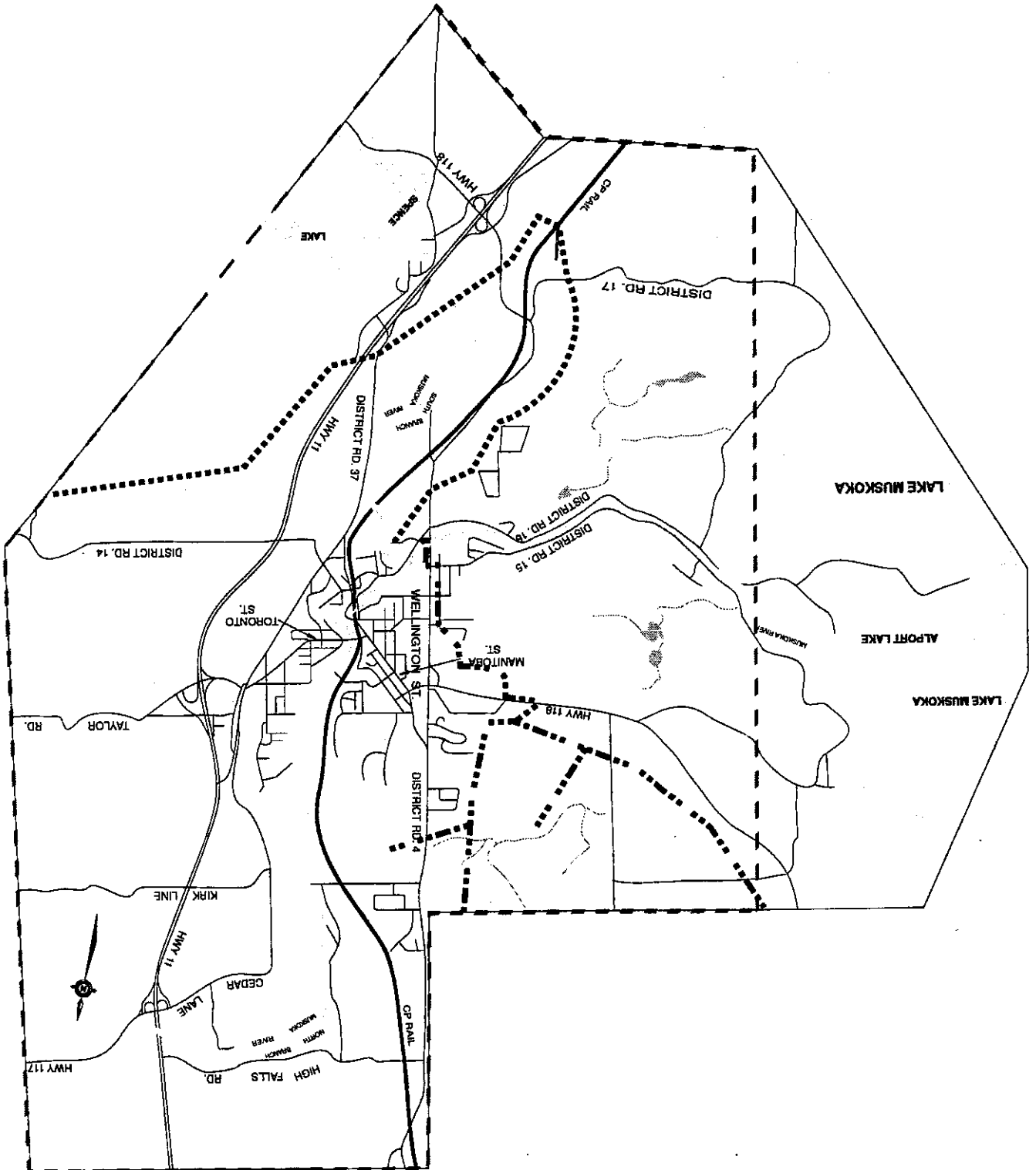
TOTTEN & HUBSCH ASSOCIATES  
ENGINEERS ARCHITECTS AND PLANNERS

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

RECREATIONAL SNOWMOBILE  
TRAIL SYSTEM  
EXHIBIT No. 4

..... HAPPY WANDERERS SNOWMOBILE CLUB  
- - - - - MUSKOKA SNO BOMBERS  
- - - - - STUDY AREA

NOT TO SCALE



## 4.0 DATA COLLECTION AND ANALYSES

### 4.1 BACKGROUND REFERENCE STUDIES

The following studies and reports were utilized as references and formed the basis for many of the assumptions contained in the Study:

- The Town of Bracebridge Traffic Operations Study, Read Voorhees and Associates Limited 1987;
- Highway 11 Planning Study, Gravenhurst to Huntsville, R.E. Winter Associates; Bracebridge 2000 (Bracebridge Each Side), Town of Bracebridge Development Services Department 1991;
- The Town of Bracebridge Parking Study, Read Voorhees and Associates Limited 1989;
- Town of Bracebridge Official Plan 1980;
- Bracebridge Secondary Plan - District OPA #16;
- Magna International - Urban Industrial Zone - District OPA #35;
- Bracebridge West Side Plan - District OPA #69;
- Royal Muskoka Resort (Open Space and Recreation, Resort Commercial, Urban Industrial), Bracebridge OPA's #10 and #14;
- Royal Muskoka Resort - Estate Residential, Bracebridge OPA #17; and
- Bracebridge Estate Plan (Estate Residential, Highway Commercial, Industrial, Institutional, Open Space), Bracebridge OPA's #11 and #14.

### 4.2 TRAFFIC COUNTS

To permit the evaluation of traffic operations and the assessment of the efficiency of the traffic signal system within the Town of Bracebridge, a comprehensive count program was undertaken as part of the Study. Manual turning movement counts were undertaken within the Study Area during the months of August 1991 and March 1992 at all key intersections to permit evaluation of existing traffic control strategies at those locations.

TSH counts were augmented by data provided by staff of the Town of Bracebridge and District Municipality of Muskoka. Trucks, automobiles and pedestrians were counted separately as part of the manual count program. The turning movement counts were undertaken during the following three periods:

- 0730 to 0930 hours;
- 1100 to 1400 hours; and
- 1600 to 1800 hours.

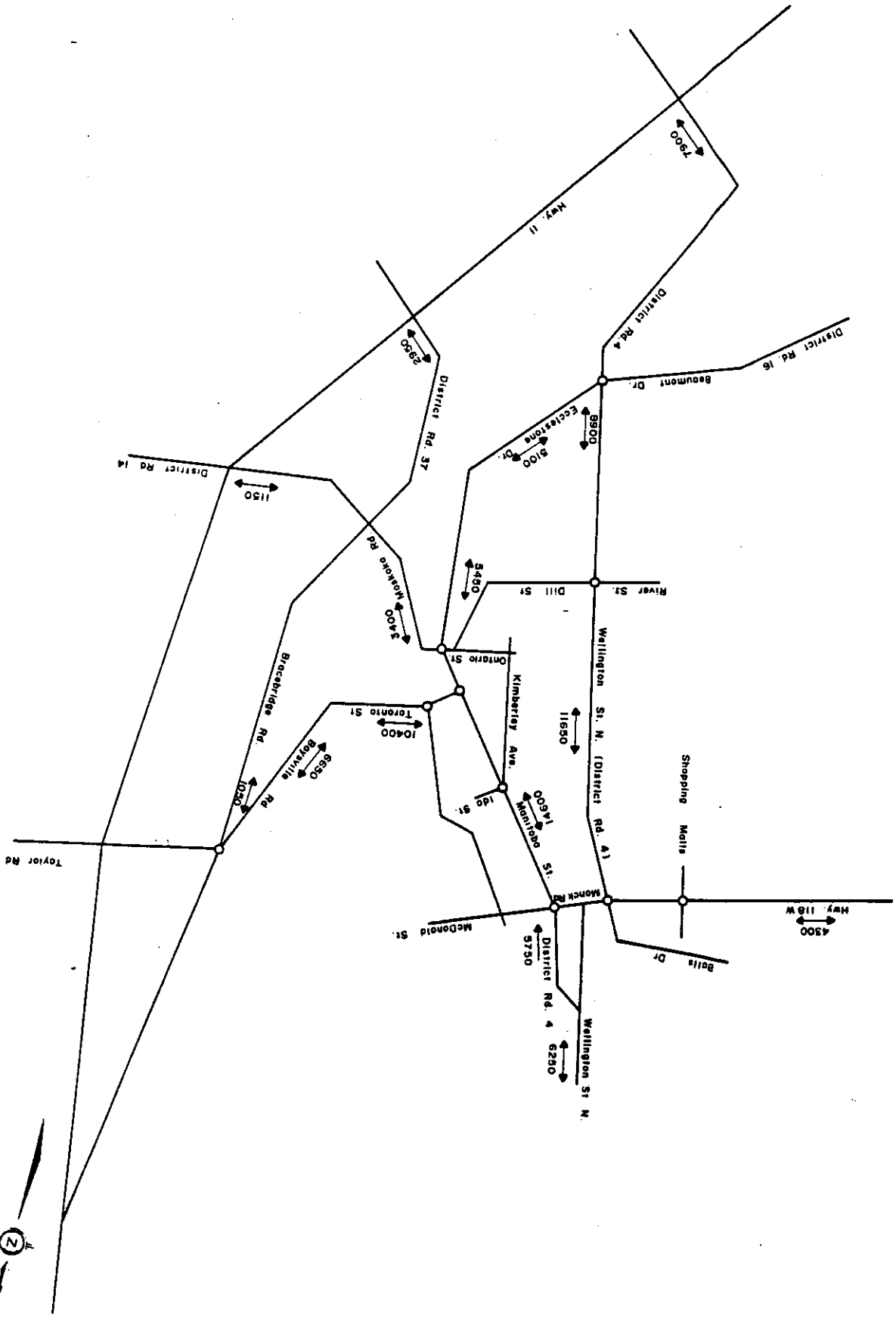
Manual counts were supplemented by a series of automatic counts conducted at strategic locations within the Study Area. It should be recognized that the District Municipality of Muskoka provided their database for use in the Study. Exhibits 5 and 6 show the 1991 annual average daily traffic (AADT) and summer average daily traffic (SADT) volumes respectively, as calculated by TSH. These counts were developed from the data collected at the automatic and manual count locations. Exhibits 7, 8 and 9 provide summaries of a.m., noon and p.m. peak hour traffic volumes for critical intersections within the Study Area based on data obtained from the manual count program. These volumes were utilized in the assessment of existing traffic control strategies.

#### 4.3 ACCIDENT DATA

Accident data was compiled from records and information provided by staff at the District Office of the Ontario Provincial Police located in Bracebridge, for the years 1989, 1990 and 1991. The data provided was summarized by year and location. Where possible, accident rates were determined and traffic operations and field conditions reviewed for roadway locations to identify, if possible, causes and rectification measures.

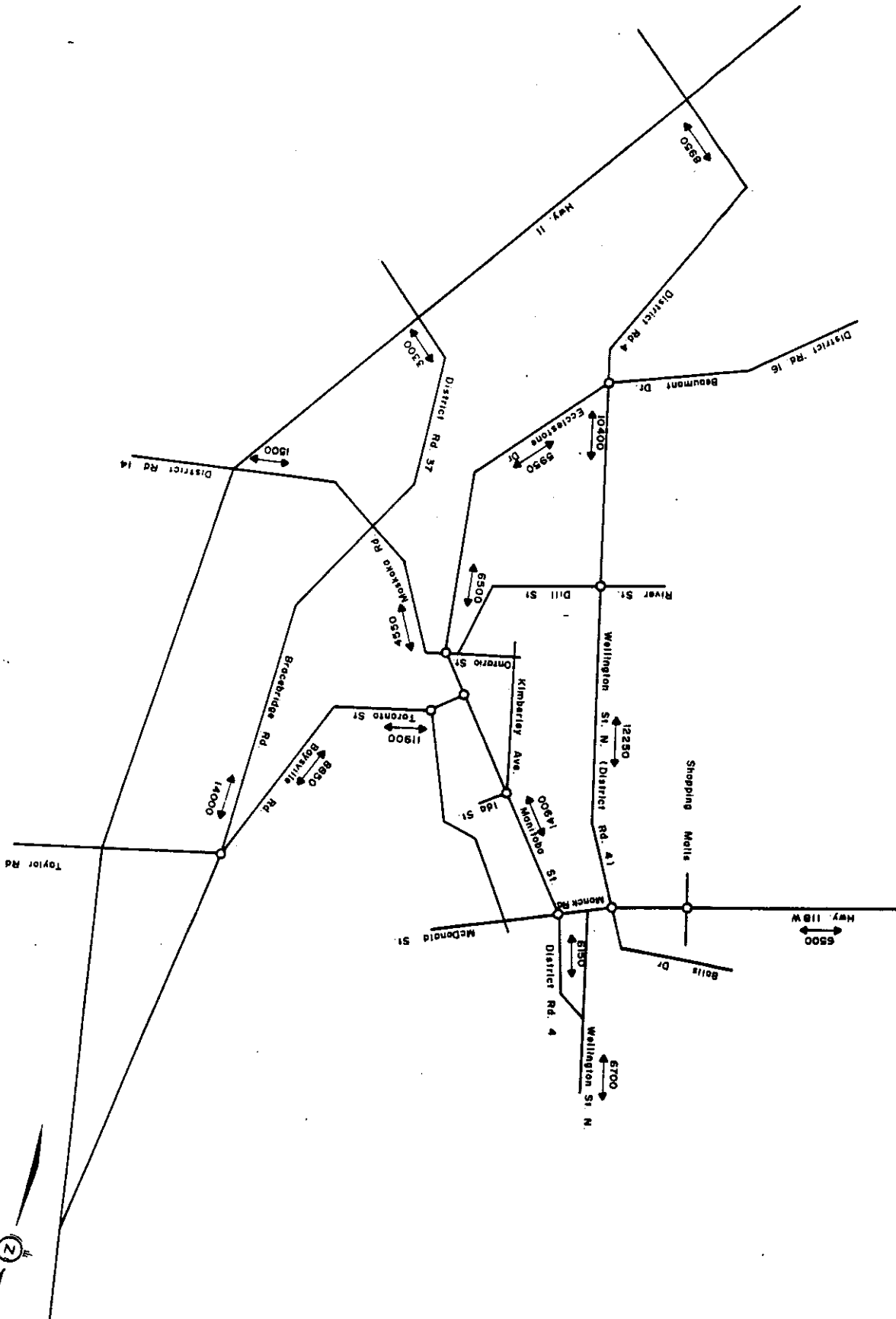
Collision rates per million entering vehicles were determined for intersection collisions. The collision rates for roadway mid-block sections were measured in collisions per million vehicle kilometres. Annual collision rates were determined using the following formulae:

AADT VOLUMES (Veh./day)  
N.T.S.



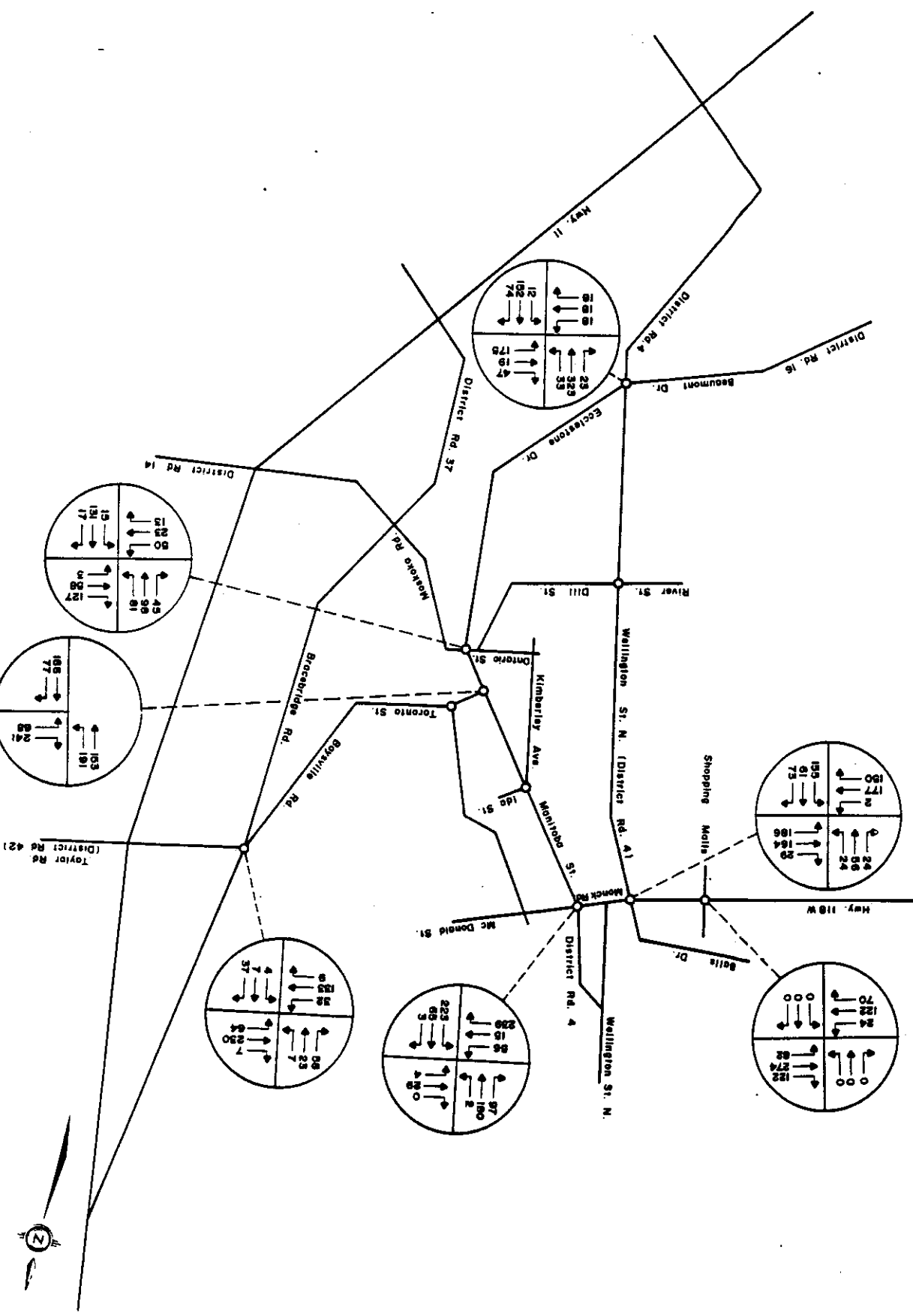
TOWN OF BRACEBRIDGE  
TRANSPORTATION PLANNING STUDY

SADT VOLUMES (Veh./day)  
N.T.S.



# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

N.T.S.

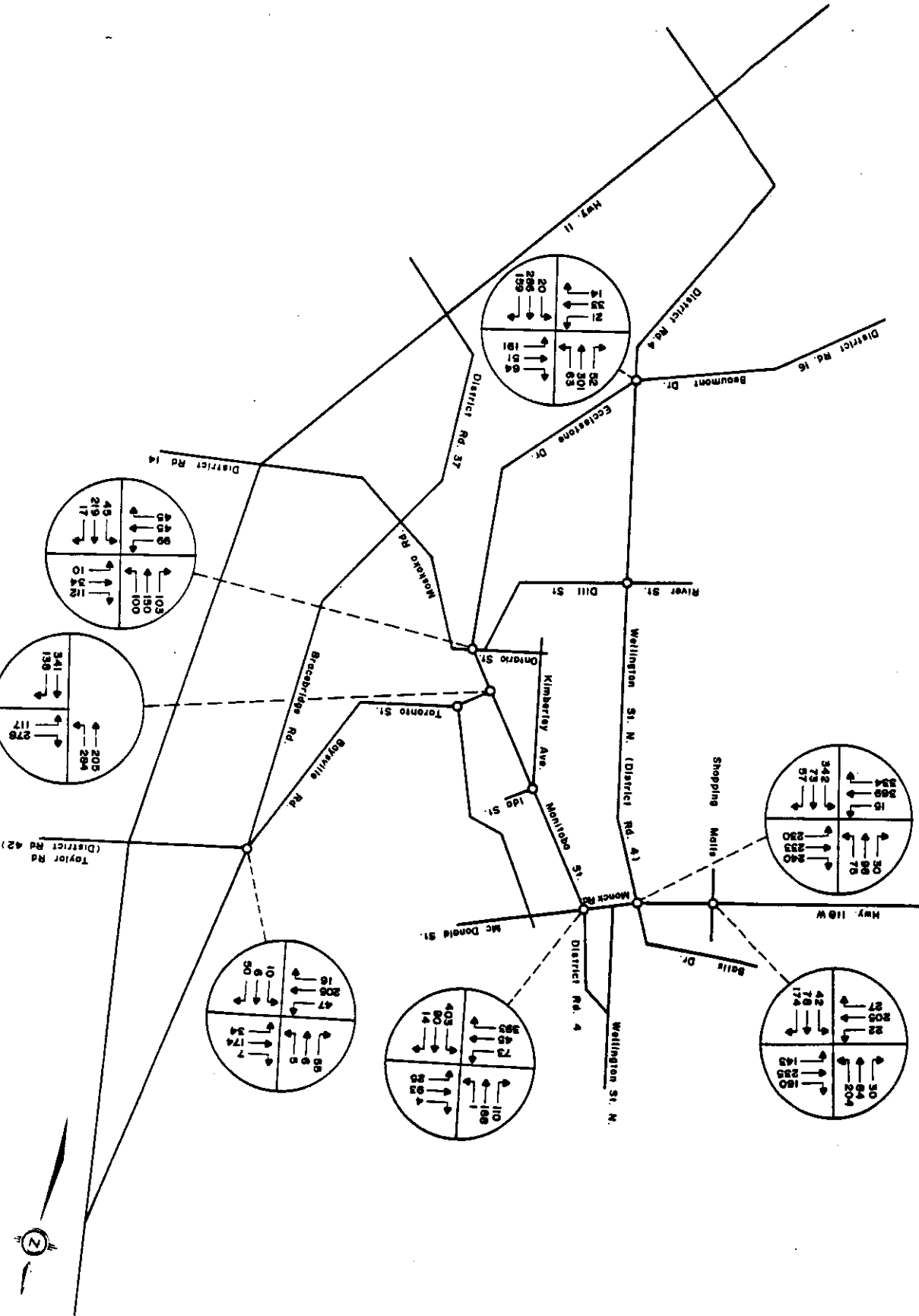


Totten and Hubicki Associates  
TRANSPORTATION AND PLANNING

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

EXHIBIT No. 8  
Noon Peak Hour Turning Movement  
Count  
Existing Conditions - 1991 AUGU

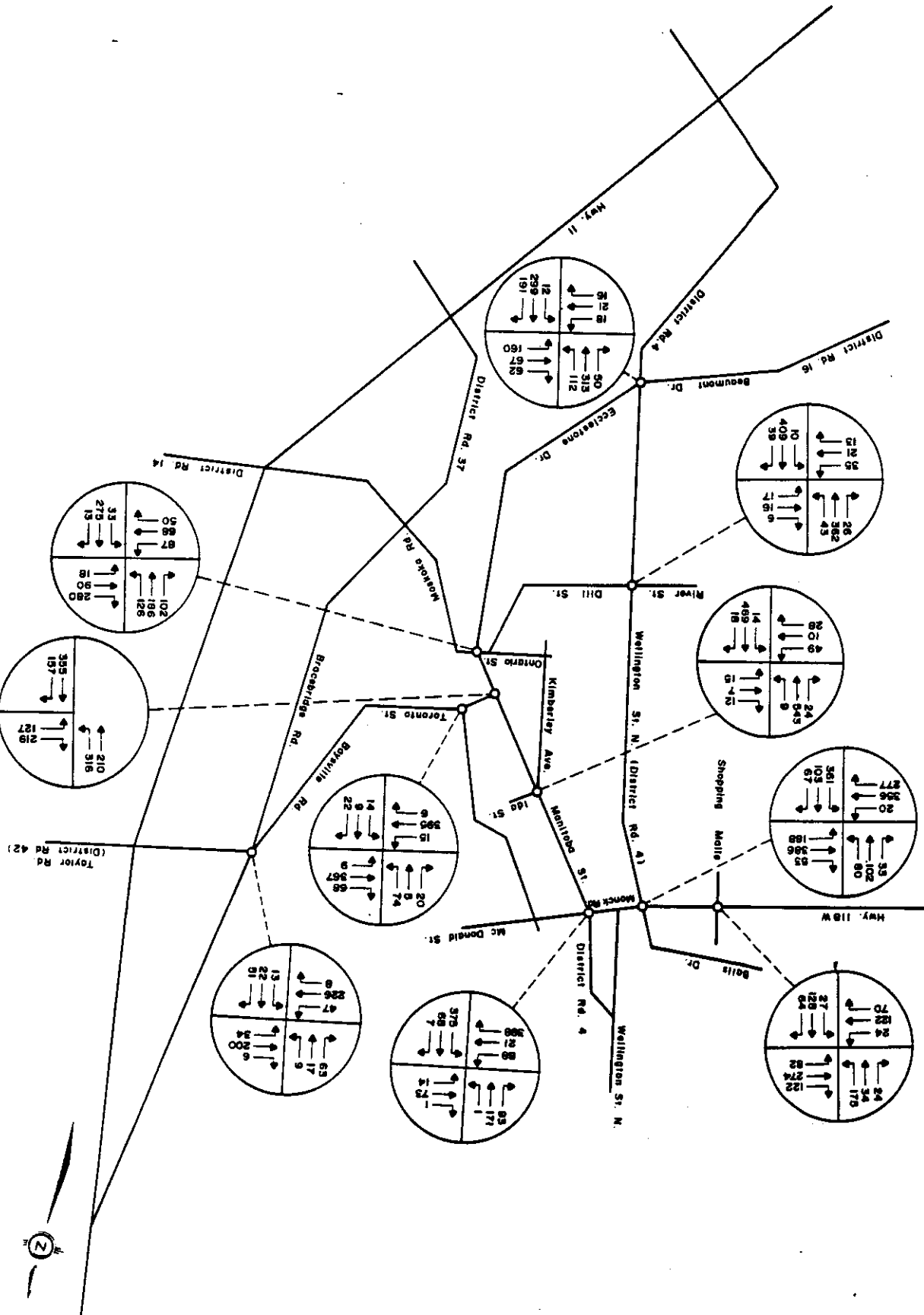
N.T.S.



# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

EXHIBIT No. 6

**N.T.S.**



24 Hrs. Intersectional Entering Volume x 365 Days

• Intersections - Collision Rate =  $\frac{\text{Number of Accidents} \times 1,000,000}{\text{AADT} \times 365 \text{ Days} \times \text{Distance (km)}}$

• Roadway Sections - Collision Rate =  $\frac{\text{Number of Accidents} \times 1,000,000}{\text{AADT} \times 365 \text{ Days} \times \text{Distance (km)}}$

Based on average conditions on roadways in Ontario, and extensive TSH experience

gained from previous studies, it is generally considered that accident rates lower than 3.0 and 1.3 are acceptable for roadway links and intersections respectively; however, the

derivation of high rates is not necessarily indicative of serious safety deficiencies. Higher rates may be due to non-geometric factors such as weather and driver conditions and may be distorted by lower vehicle volumes. A review of accident rates within the Study Area, as provided in Table 1 indicate that, only conditions on Manitoba Street (District Road 37) between Ontario Street and Monck Road are worthy of further review from an accident

perspective. Field observations by TSH staff along the above noted roadway revealed that problems at this location were mainly the result of traffic turning to and from side streets and from on-street parking manoeuvres.

#### 4.4 SURVEY DATA

##### 4.4.1 Interview Survey at Major Trip Generators

To assist in the understanding of existing travel habits and the trip making

characteristics of the residents within the Study Area, interviews were conducted at the South Muskoka Memorial Hospital, the retail malls and outlets on Monck

Road west of Wellington Street and in the commercial area along Manitoba Street.

**Town of Bracebridge Transportation Study  
Summary of Accident Statistics**

**Table 1**

| 1. INTERSECTIONS                    | LOCATION | 1989                    |                    |                  | 1990                    |                    |                  | 1991                    |                    |                  | AVERAGE 3 YEAR<br>ACCIDENT RATE |
|-------------------------------------|----------|-------------------------|--------------------|------------------|-------------------------|--------------------|------------------|-------------------------|--------------------|------------------|---------------------------------|
|                                     |          | 24 HOUR<br>ENTERING VOL | NO. OF<br>ACCIDENT | ACCIDENT<br>RATE | 24 HOUR<br>ENTERING VOL | NO. OF<br>ACCIDENT | ACCIDENT<br>RATE | 24 HOUR<br>ENTERING VOL | NO. OF<br>ACCIDENT | ACCIDENT<br>RATE |                                 |
| District Road 4/ Highway 11         |          | N/A                     | 0                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 2                  | N/A              | N/A                             |
| District Road 4/ Beaumont Drive     |          | 12573                   | 4                  | 0.87             | 12887                   | 1                  | 0.21             | 13209                   | 3                  | 0.62             | 0.57                            |
| District Road 4/Armstrong Street    |          | N/A                     | 2                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 4/Robert Dollar Drive |          | N/A                     | 2                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 4/McCrack Drive       |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 4/Ontario Street      |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 4/Mantoba Street      |          | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 3                  | N/A              | N/A                             |
| District Road 4/Wellingdon Drive    |          | N/A                     | 0                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 2                  | N/A              | N/A                             |
| District Road 42/Bird Lane          |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                             |
| District Road 42/Pine Street        |          | N/A                     | 3                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 42/York Street        |          | N/A                     | 2                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 42/Bracebridge Road   |          | 6686                    | 1                  | 0.41             | 6853                    | 1                  | 0.40             | 7025                    | 1                  | 0.39             | 0.40                            |
| District Road 42/Woodward Street    |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 37/Ontario Street     |          | 12666                   | 4                  | 0.87             | 12983                   | 0                  | 0.00             | 13307                   | 1                  | 0.21             | 0.36                            |
| District Road 37/Thomas Street      |          | 13285                   | 2                  | 0.41             | 13617                   | 3                  | 0.60             | 13957                   | 3                  | 0.59             | 0.53                            |
| District Road 37/Monck Road         |          | 12495                   | 5                  | 1.10             | 12808                   | 2                  | 0.43             | 13128                   | 0                  | 0.00             | 0.51                            |
| District Road 37/Wellingdon Drive   |          | 19297                   | 8                  | 1.14             | 19779                   | 5                  | 0.69             | 20274                   | 4                  | 0.54             | 0.79                            |
| District Road 37/Ann Street         |          | N/A                     | 2                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 1                  | N/A              | N/A                             |
| District Road 37/Bals Drive         |          | N/A                     | 3                  | N/A              | N/A                     | 2                  | N/A              | N/A                     | 1                  | N/A              | N/A                             |
| District Road 37/Park Lane          |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 37/Mary Street        |          | N/A                     | 2                  | N/A              | N/A                     | 0                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 37/Queen Street       |          | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 37/Carleton Street    |          | N/A                     | 0                  | N/A              | N/A                     | 2                  | N/A              | N/A                     | 0                  | N/A              | N/A                             |
| District Road 37/Dominion Street    |          | N/A                     | 0                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 2                  | N/A              | N/A                             |
| District Road 37/Highway 11         |          | N/A                     | 0                  | N/A              | N/A                     | 1                  | N/A              | N/A                     | 1                  | N/A              | N/A                             |
| District Road 37/Kimberley Avenue   |          | 11648                   | 0                  | 0.00             | 11939                   | 1                  | 0.23             | 12237                   | 1                  | 0.22             | 0.15                            |

Note: Intersection Accident Rate =

No. of Accidents x 1,000,000

24 hr. entering volume x 365 days

N/A - Not Available

The interview survey was undertaken on a typical summer weekday and approximately 650 individuals were asked to answer questions relative to the specific trip that led them to the interview location in addition to information on their daily trip making habits. This method of survey was selected to determine home-based and other non-home based trip characteristics within the Study Area as the four interview sites represent the major trip attractors within the Town of Bracebridge. It is acknowledged that home-based and other non-home-based trip information associated with other smaller trip attractors in the Town of Bracebridge have generally not been collected. Given the size of the Study Area and the nature of the local industries and major trip attractors, this will not have an impact on the quality of survey results. Indeed the excellent data associated with the major trip attractors may, in fact, result in a greater level of accuracy when future traffic patterns are predicted.

#### **4.4.2 Employee Survey**

In order to determine the work trip characteristics of the residents of the Town of Bracebridge, a survey was undertaken of major employers. A total of 10 major employers were surveyed, resulting in a total of 1,730 employees responding, accounting for approximately 30% of the total employment in the Town. As part of the survey, all employees within the 10 major employers were requested to provide the postal codes for each employee resident. Utilizing a municipal address map and reference points taken from the Ontario Base Mapping, each postal code was then geo-coded into the appropriate traffic zone (see Section 7.1.2) by using a mapping software (MapINFO).

The information obtained from the employee survey was re-organized or re-stratified to form an origin/destination matrix depicting work trip travel patterns of the residents of the Town of Bracebridge. Additional details regarding the origin/destination or trip interchange matrix is provided in Section 7.1.3 of the report.

#### 4.4.3 Origin/Destination Survey

An origin/destination survey was conducted by TSH as part of the Transportation Study to identify the relative volume of through traffic that is travelling through Town on an average summer weekday. The origin/destination survey was also intended to supplement origin/destination information collected by the Ministry of Transportation in 1989 as part of their Highway 11 Planning Study. The TSH origin/destination survey was conducted on August 23rd, 1991 with an interview station established to the west of the urban area on Highway 118. During the course of the interview survey, occupants of 1,200 vehicles were interviewed by TSH staff. This represents approximately 28% of the traffic which travelled through the interview station on the day of the survey.

It is of note that approximately 25% of the trips passing through the interview station can be classified as through trips; that is, trips with an ultimate origin/destination outside the Study Area but which, because of the existing roadway network, must travel through the urban area to reach their destination. It is also important to acknowledge that approximately 80% of the through trips are travelling from the south of the Study Area to the west of the Study Area or vice versa. Another point of note involves the number of motorists who indicated that, although they were making a through trip, they stopped in the Town to conduct personal business or to do some shopping.

Of the 25% of the through trips which were observed at the interview station, which represents approximately 1,900 trips per day, 45% (850) of the motorists stopped in town. This is an important consideration when assessing the feasibility of new routes within or outside the urban area.

As previously mentioned, the TSH origin/destination survey was used to supplement origin/destination information collected by the Ministry of Transportation in 1989 as part of the Highway 11 Planning Study. The MTO origin/destination survey along with the TSH origin/destination data, when combined with place of work data available from the 1986 census place of residence/place of work data, provides excellent information relative to trips having an origin or destination external to the Study Area or travelling completely through the Study Area.

#### 4.5 ON-STREET PARKING

A visual assessment of on-street parking was undertaken as part of the traffic operations portion of the Study. The impact of parking and traffic operations was reviewed specifically on Manitoba Street from Ontario Street to Monck Road. It is important to note that the Study did not include a parking space inventory or occupancy survey. Field observations during the a.m., noon and p.m. peak periods did indicate that on-street facilities along Manitoba Street, on an average summer weekday, generally have a high occupancy rate approaching 100 percent and that there appeared to be a limited number of spaces available within the downtown area in both on and off-street facilities. Again, it is important to recognize that these comments are based on observations only.

Although metered parking spaces are clearly designated on Manitoba Street, as a general guideline, parking should not be permitted within 15 to 30 m of an intersection on and after each approach.

#### 4.6 SIGNING AND PAVEMENT MARKINGS

Although, the Terms of Reference for the Study did not include a review of signing and pavement markings, an overview of these control measures was obtained during our field surveys. Signing and pavement markings in the Town and within the Study Area generally appear to be adequate.

Pavement markings within the Study Area were also reviewed for compliance with the MUTCD standards. Markings have a definite function to perform in a comprehensive

traffic management system. They may be used to supplement the regulations or warnings of other devices, such as traffic signs or signals. In other cases, they serve, by

themselves, to convey the regulations and warnings in an effective manner that otherwise could not be achieved. It is imperative that all markings, like all traffic control devices, be uniform so that they may be recognized and understood immediately. Pavement markings tend to fade over time. It is recommended that the Town of Bracebridge and the District Municipality of Muskoka ensure that pavement marking programs are undertaken on a

semi-annual basis, if considered necessary. This is consistent with current practice across the Province.

#### 4.7 PEDESTRIAN MOVEMENTS/CROSSINGS

A review of pedestrian crossing at intersections within the community revealed that these facilities are generally operating in a safe and efficient manner. Currently, no additional pedestrian cross-overs are warranted within the Study Area. Areas where mid-block existing pedestrian cross-over (Ann Street) or signalized locations to warrant installation of an additional pedestrian cross-over. Relocation of the existing pedestrian cross-over on Manitoba Street is not recommended.

#### 4.8 BICYCLE PATH SYSTEM

In 1976, Statistics Canada reported that 8,000,000 Canadians ride their bicycles. Bicycle sales currently exceed those of automobiles and in the U.S.A., it is estimated that more than one-half a million people cycle to work every day; consequently, it is apparent that the bicycle is here to stay. Cycling provides accessible and affordable transportation to complement the existing transportation network when proper linkages are provided. The recent increase in popularity with respect to bicycle use can be attributed to the following:

- The increased costs associated with owning and operating a vehicle;
- The bicycle being recognized as a quick option in congested areas;
- The green movement becoming socially acceptable; and
- A growing awareness of the benefits of exercise.

The increased profile of cycling is a strong trend reflected in many jurisdictions throughout North America. Demands of cyclists have been felt at all levels of Government. The Ministry of Transportation is currently promoting cycling as an alternative to the automobile and are consequently funding numerous bicycle studies across the Province. Recognizing the existence of several cyclist users and different traffic and road conditions, the Ministry of Transportation has developed standards and guidelines for different bikeway types. Municipalities can adopt several types of bikeways ensuring a flexible approach when planning cycling facilities in their area.

It is recognized that locally driven planning better accommodates the specific needs of an area. In addition, the commitment to cycling can differ between jurisdictions. One municipality may prefer a single central path where others may require a larger network. Route connectivity should reflect local needs and be designed to encourage cyclist travel.

Cycling routes must be safe, appear to be safe and connect at critical locations to be successful. The most practice method for planning is to identify and link potential trip generators including schools, parks, shopping centres, work places and neighbourhoods.

Bikeways can be defined as any portion of a roadway, lane or path specifically designed for cycle traffic exclusively, or alongside other vehicles or pedestrians. Therefore, basic types of bikeways including shared roadway, shoulder bikeway, bike lanes and bike paths must be considered in the development of any comprehensive plan. As previously

discussed, the Town of Bracebridge does not have a cycle plan or a recognized network. The Town of Bracebridge also does not have a definitive pedestrian path network within the community. Therefore, it is recommended that the Town of Bracebridge and the District Municipality of Muskoka, in conjunction with the Ministry of Transportation,

develop both a pedestrian and bicycle route system which would form an integral part of the local transportation network. These networks should be developed in consultation with local residents, cycling groups and other interested parties. All possible opportunities for bike and pedestrian facilities should be reviewed including, use of pathways along the river, pathways adjacent to existing rail lines, on-street bike lanes, etc. Should the CN Rail line, which bisects the community, be abandoned in the future, this facility would be an excellent right-of-way to employ for a bicycle and/or pedestrian pathway.

In general the Town and District should:

- Encourage bicycle and pedestrian routes linking green space areas and providing access to major employment centres;
- Give consideration to the provision of safe and convenient bicycle and pedestrian routes in the review of all development and re-development applications;
- When considering the construction or reconstruction of roads and bridges, investigate and provide for bicycle lanes wherever possible; and
- Require the provision of bicycle storage space and facilities.

## 5.0 TRAFFIC ANALYSIS

### 5.1 INTERSECTION AND LINK CAPACITY ANALYSIS

In order to further assess traffic operations within the Study Area, capacity analyses were conducted for both intersections and roadway links using traffic information data obtained from both the TSH data collection program and District Municipality of Muskoka and MTO counts. With respect to intersections, capacity analyses were undertaken for both signalized and unsignalized intersections using software associated with the Transportation Research Board Highway Capacity Manual (Special Report 209).

The performance of an intersection is defined by the level of service (LOS), it does, or could provide. At signalized intersections, the level of service is a measure of the mobility of traffic determined mainly by vehicle delay. For example, Level of Service A represents almost "free flow" conditions and corresponds to an average delay of less than 5 seconds per vehicle. At Level of Service F, "forced flow" conditions dominate.

Capacity at an intersection is defined by a combination of factors such as the volume to capacity ratio (V/C) and the vehicle delay. At signalized intersections, the capacity is the maximum rate of flow that can pass through the intersection under prevailing traffic, roadway and signalization conditions.

The capacity of unsignalized intersections, either stop or yield sign controlled, is determined mainly by residual capacity. Both level of service and capacity must be considered when assessing the operational characteristics of an intersection. The relationship between the level of service and V/C is generally indicated below:

| LEVEL OF SERVICE | MAXIMUM V/C RATIO |
|------------------|-------------------|
| A                | .6                |
| B                | .7                |
| C                | .8                |
| D                | .9                |
| E                | 1.0               |
| F                | Not Applicable    |

A basic saturation flow value of between 1,400 to 1,500 vehicles per hour of green for a through lane was considered appropriate for use roadways within the Town of Bracebridge. This value is critical to the capacity evaluation process and has been confirmed by TSH in other studies of a similar nature within communities similar in size to Bracebridge. This parameter was employed in the capacity analysis process to ensure that local operating conditions were addressed.

Saturation flow is defined as a number of passenger car units (PCU) which can be discharged across the stop line of an intersection approach lane under given geometric, traffic and ambient conditions, from a continuous queue during a green interval or its portion, usually expressed as an hourly rate of flow (PCU/hour - green).

Table 2 summarizes the results of intersection capacity analysis relating to existing conditions for the signalized and unsignalized intersections considered within the context of this particular study. Based on these summaries, it has been concluded that a majority of signalized and unsignalized intersections are currently operating at what is considered an acceptable level of service. The results of the capacity analysis shown in Table 2 reflect the summer turning movement counts undertaken by TSH.

**Table 2**  
**Town of Bracebridge Transportation Study**  
**Intersection Capacity Analysis**  
**Summary of Existing Conditions**

| LOCATION                          | A.M. PEAK |      |      | NOON PEAK |      |      | P.M. PEAK |      |      |
|-----------------------------------|-----------|------|------|-----------|------|------|-----------|------|------|
|                                   | LOS       | V/C  | R.C. | LOS       | V/C  | R.C. | LOS       | V/C  | R.C. |
| Hwy 118/Mall Entrance             | B         | 0.28 | N/A  | C         | 0.41 | N/A  | C         | 0.48 | N/A  |
| Hwy 118/Wellington Street         | B         | 0.31 | N/A  | C         | 0.60 | N/A  | D         | 0.61 | N/A  |
| Monck Road/Manitoba Street        | C         | 0.40 | N/A  | F+        | 0.49 | N/A  | F+        | 0.51 | N/A  |
| Manitoba Street/Ida Street        | N/A       | N/A  | N/A  | N/A       | N/A  | N/A  | D         | N/A  | 129  |
| Manitoba Street/Thomas Street     | B         | 0.42 | N/A  | B         | 0.67 | N/A  | B         | 0.66 | N/A  |
| Manitoba Street/ Ontario Street   | C         | N/A  | 254  | D         | N/A  | 150  | D         | N/A  | 149  |
| Thomas Street/Main Street         | N/A       | N/A  | N/A  | N/A       | N/A  | N/A  | D         | N/A  | 193  |
| Bracebridge Road/Taylor Road      | B         | N/A  | 343  | B         | N/A  | 364  | B         | N/A  | 329  |
| Wellington Street/Dill Street     | N/A       | N/A  | N/A  | N/A       | N/A  | N/A  | D         | N/A  | 179  |
| Wellington Street/Beaumont Street | B         | 0.51 | N/A  | B         | 0.66 | N/A  | D         | 0.81 | N/A  |

Note:

- Existing Conditions - Existing intersection geometrics and signal timing/phasing
- LOS - Level of Service
- V/C - Volume to Capacity Ratio (Signalized intersections only)
- R.C. - Residual Capacity - veh/hr per critical movement (Unsignalized intersections only)
- N/A - Not Applicable or Not Calculated

Signalized intersection - LOS is calculated for the overall intersection  
Unsignalized intersection - LOS of overall intersection is based on the LOS of the critical movement.

Considering existing traffic volumes, only the intersections of Monck Road and Manitoba Street, Wellington Street and Beaumont Drive can be considered as operating close to or at an unacceptable level of service.

For the Town of Bracebridge, Level of Service D is considered to be a satisfactory level of service during peak conditions. Any level of service worse than D, that is E or F should be addressed through the implementation of operational or physical improvements. Level of Service E or F, however, could be tolerated for short periods of time in the downtown area.

Table 3 provides a summary of existing conditions on roadway links within the Town of Bracebridge. As can be noted from the Table 3, sections of Wellington Street and Manitoba Street are operating at a level of service which is considered unacceptable. For this assessment, both AADT and SADT volumes were employed.

In addition to intersection and link capacity analysis, an assessment of a number of screenlines within the community was undertaken to evaluate overall north-south and east-west roadway capacity in relation to traffic demand. A screenline is a line established to divide the Study Area into parts for the purposes of checking the accuracy of survey data or analyzing general directional traffic patterns and trends. Table 4 provides a summary of the screenline capacity analysis conducted for three selected screenlines within the community. These screenlines are identified on Exhibit 10. As can be noted from Table 4, Screenline B-B is currently operating with a volume to capacity ratio in excess of 1.0 - unsatisfactory operating conditions. This indicates that there is insufficient north-south capacity to accommodate existing travel demand. As can be noted, this screenline is comprised of links on Wellington Street and Manitoba Street, both of which are individually exhibiting capacity problems.

Table 3

**Town of Bracebridge Transportation Study**  
**Roadway Link Capacity Analysis**  
 (Existing Conditions)

| Location of Roadway Links           | Number of Lanes | Lane Capacity Assumed (Veh/hr) | Link Capacity (Veh/Day) | Annual Average Daily Traffic (AADT) (Veh/Day) | Summer Average Daily Traffic (SADT) (Veh/Day) | AADT/Capacity | SADT/Capacity |
|-------------------------------------|-----------------|--------------------------------|-------------------------|-----------------------------------------------|-----------------------------------------------|---------------|---------------|
| <b>1. District Road 4</b>           |                 |                                |                         |                                               |                                               |               |               |
| Winhara Road - District Road 17     | 2               | 500                            | (12,579) %              | 7,900                                         | 8,950                                         | 0.61          | 0.71          |
| Ecclestone Drive - Gordon Street    | 2               | 500                            | 10,893                  | 8,900                                         | 10,400                                        | 0.82          | 0.95          |
| Ontario Street - Armstrong Street   | 2               | 500                            | 12,255                  | 11,650                                        | 12,250                                        | 0.95          | 1.00          |
| McDonald Street - Liddard Street    | 2               | 500                            | 10,684                  | 5,750                                         | 6,150                                         | 0.54          | 0.58          |
| Wellington Street - Manitoba Street | 4               | 500                            | 20,202                  | 10,900                                        | 12,550                                        | 0.54          | 0.62          |
| Westvale Drive - McCrank Drive      | 2               | 600                            | 10,929                  | 6,250                                         | 6,700                                         | 0.57          | 0.61          |
| <b>2. District Road 14</b>          |                 |                                |                         |                                               |                                               |               |               |
| Highway 11 - Johnston Heights       | 2               | 500                            | 8,426                   | 1,150                                         | 1,500                                         | 0.14          | 0.18          |
| <b>3. District Road 16</b>          |                 |                                |                         |                                               |                                               |               |               |
| Young Street - Ontario Street       | 2               | 500                            | 11,231                  | 5,450                                         | 6,500                                         | 0.49          | 0.58          |
| Wellington Street - Southbank Drive | 2               | 500                            | 11,161                  | 8,900                                         | 10,050                                        | 0.80          | 0.90          |
| <b>4. District Road 37</b>          |                 |                                |                         |                                               |                                               |               |               |
| Hwy 11 - Muskoka Pines Road         | 2               | 600                            | 11,905                  | 2,950                                         | 3,300                                         | 0.25          | 0.28          |
| Queen Street - Ontario Street       | 2               | 600                            | 11,029                  | 3,400                                         | 4,550                                         | 0.31          | 0.41          |
| Ida Street - Ann Street             | 2               | 500                            | 12,987                  | 14,600                                        | 14,900                                        | 1.12          | 1.15          |
| <b>5. Bracebridge Road</b>          |                 |                                |                         |                                               |                                               |               |               |
| Monica Lane - Taylor Road           | 2               | 600                            | 9,677                   | 1,050                                         | 1,400                                         | 0.11          | 0.14          |
| <b>6. District Road 42</b>          |                 |                                |                         |                                               |                                               |               |               |
| Highway 11 - Bracebridge Road       | 2               | 600                            | 12,121                  | 4,400                                         | 5,850                                         | 0.36          | 0.48          |
| Pine Street - Sherwood Drive        | 2               | 500                            | 11,534                  | 6,650                                         | 8,850                                         | 0.58          | 0.77          |
| Front Street - Main Street          | 2               | 500                            | 11,366                  | 10,400                                        | 11,900                                        | 0.91          | 1.05          |
| <b>7. Highway 118</b>               |                 |                                |                         |                                               |                                               |               |               |
| West Study Limit - Balls Drive      | 2               | 700                            | 14,141                  | 4,300                                         | 6,500                                         | 0.30          | 0.46          |

Link Capacity = (P.M. Peak Hour Approach Capacity + P.M. Peak Hour Directional Split) + P.M. Peak Hour Factor

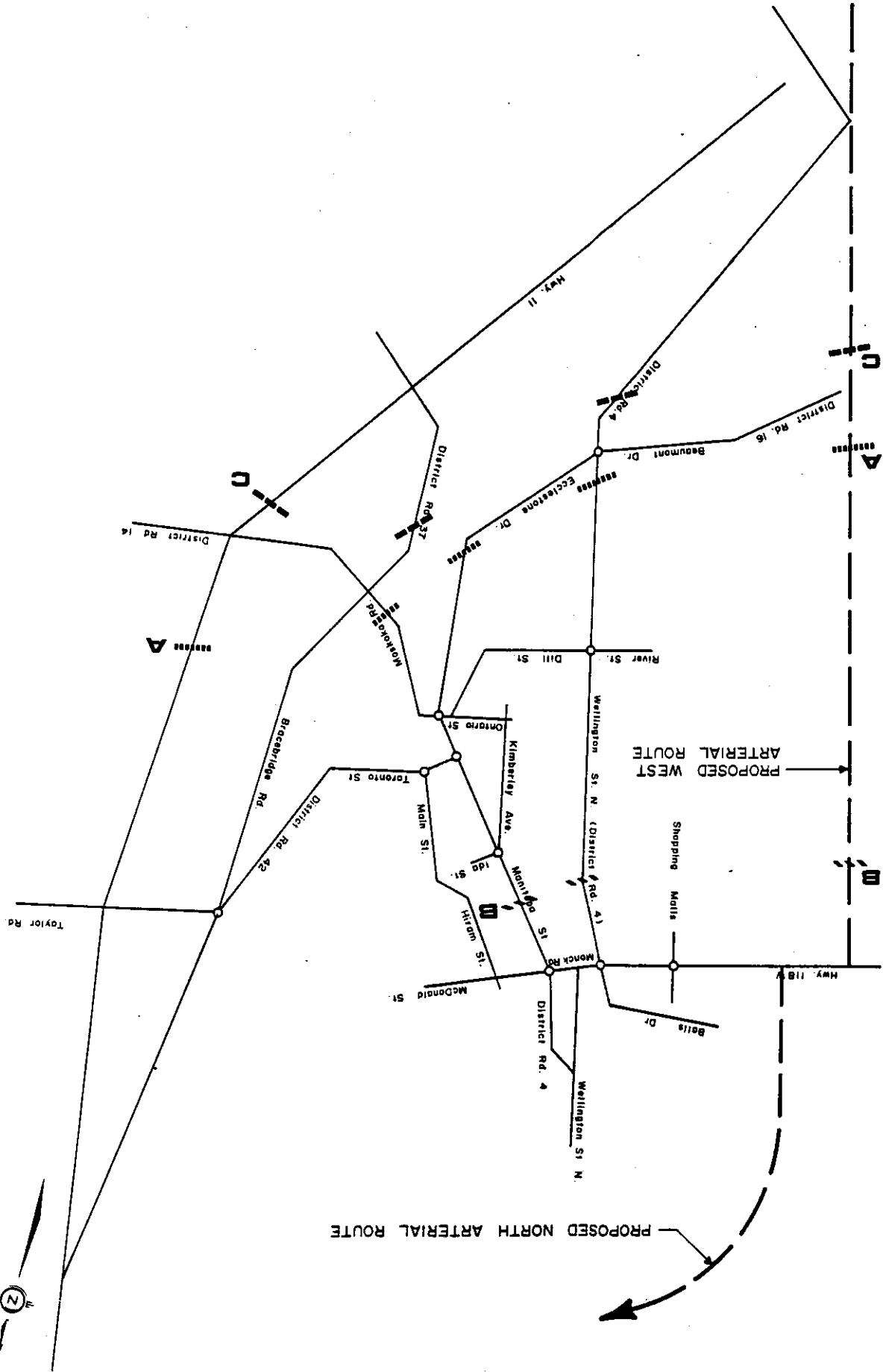
which was then assigned/allocated to the?

**Table 4**

**Town of Bracebridge Transportation Study  
Existing Screenline Capacity Analysis  
(P.M. Peak Hour)**

| Roadway Link      | Existing Conditions |            |            |            |            |            | Link Capacity Assumed (Veh/hr) |
|-------------------|---------------------|------------|------------|------------|------------|------------|--------------------------------|
|                   | Observed Traffic    |            |            |            |            |            |                                |
|                   | Volume (Veh/hr)     |            | V/C        |            |            |            |                                |
|                   | Northbound          | Southbound | Northbound | Southbound | Northbound | Southbound |                                |
| Screenline A-A    |                     |            |            |            |            |            |                                |
| Wellington Street | 431                 | 448        | 0.86       | 0.90       |            | 500        |                                |
| District Road 16  | 321                 | 254        | 0.64       | 0.51       |            | 500        |                                |
| District Road 37  | 389                 | 218        | 0.65       | 0.36       |            | 600        |                                |
| Hwy 11            | 692                 | 506        | 0.18       | 0.13       |            | 3,800      |                                |
| New Crossing      | N/A                 | N/A        | N/A        | N/A        |            | N/A        |                                |
| Total Screenline  | 1,833               | 1,426      | 0.34       | 0.26       |            | 5,400      |                                |
| Screenline B-B    |                     |            |            |            |            |            |                                |
| Wellington Street | 531                 | 567        | 1.06       | 1.13       |            | 500        |                                |
| Manitoba Street   | 501                 | 586        | 1.0        | 1.17       |            | 500        |                                |
| New Crossing      | N/A                 | N/A        | N/A        | N/A        |            | N/A        |                                |
| Total Screenline  | 1,032               | 1,153      | 1.03       | 1.15       |            | 1,000      |                                |
| Screenline C-C    |                     |            |            |            |            |            |                                |
| Wellington Street | 449                 | 489        | 0.74       | 0.82       |            | 500        |                                |
| District Road 37  | 389                 | 218        | 0.65       | 0.36       |            | 600        |                                |
| Hwy 11            | 681                 | 511        | 0.18       | 0.13       |            | 3,800      |                                |
| New Crossing      | N/A                 | N/A        | N/A        | N/A        |            | N/A        |                                |
| Total Screenline  | 1,519               | 1,218      | 0.31       | 0.24       |            | 4,900      |                                |

V/C - Volume to Capacity Ratio  
N/A - Not Applicable



## 5.2 TRUCK TRAFFIC

Field observations indicated that, due to prevailing intersection geometrics, trucks are currently experiencing significant turning movement problems at the intersection of Manitoba Street and Thomas Street. In order to further assess truck traffic problems in the community, a survey was undertaken of a number of businesses which generate significant volumes of commercial vehicle traffic. Table 5 provides a summary of comments received from these organizations relative to problems encountered on the local transportation system.

## 5.3 VEHICLE SPEEDS

A survey of local School Boards revealed concerns regarding speeding problems adjacent to all schools. No other speeding issues were identified during the course of the Study.

## 5.4 SUMMARY OF EXISTING PROBLEM AREAS

The existing and potential problem and deficiency locations identified in this section of the Study are shown in Table 6.

**TABLE 6  
SUMMARY OF EXISTING PROBLEM LOCATIONS**

| Location                                                             | Classification of Problems/Deficiencies                                                                                                                                                                                                                               |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manitoba St. Monck Road                                              | Signal timing should be revised                                                                                                                                                                                                                                       |
| Truck Traffic                                                        | Commercial vehicles, particularly large transport trucks, are having difficulty making turning movements at Manitoba St./Thomas St. intersection. Trucks on Manitoba Street are resulting in safety, noise and capacity concerns.                                     |
| Manitoba Street (District 37 in the Central Business District (CBD)) | District Road 37 (Manitoba Street) in the CBD is currently operating at capacity between Thomas Street and Monck Road during the p.m. peak period.<br>Turning traffic at intersections is resulting in safety and operational concerns for motorists and pedestrians. |
| Wellington St./Beaumont Drive                                        | Geometric improvements are required to resolve intersection capacity and operational deficiencies.                                                                                                                                                                    |
| Wellington Street (District Road 4)                                  | The section between Beaumont Drive and Highway 118 is currently operating at capacity.                                                                                                                                                                                |
| All School Areas                                                     | Perceived speeding problem adjacent to schools.                                                                                                                                                                                                                       |

**Table 5**  
**Town Of Bracebridge Transportation Study**  
**Industrial Interview Summary**

| Name of The<br>Surveyed Company        | Company<br>Location                     | Daily Truck Operation<br>(veh/day) |     | Truck<br>Trailer % | Traffic Assignment                                                                                                        |                | Comments                                                                                                                                                    |
|----------------------------------------|-----------------------------------------|------------------------------------|-----|--------------------|---------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                                         | In                                 | Out |                    | Routing                                                                                                                   | %              |                                                                                                                                                             |
| Fowler Construction<br>Company Limited | 1 Kirk Line,<br>Bracebridge             | 300                                | 300 | 20                 | Hwy 11 North to Taylor Road<br>Hwy 11 South to Taylor Road<br>Taylor Road From Toronto Street                             | 15<br>15<br>70 | Need to bypass the lights on<br>Manitoba Street. Short-cut to Hiram<br>Street to Monck Road. - call it a truck<br>route with all necessary<br>improvements. |
| Ontario Hydro                          | Taylor Road,<br>Bracebridge             | 5                                  | 5   | 50                 | Hwy 11 to Taylor Road<br>Baysville Road to Taylor Road                                                                    | 80<br>20       | No Comment                                                                                                                                                  |
| Muskoka Transport                      | 456 Ecclestone<br>Drive,<br>Bracebridge | 80                                 | 80  | 95                 | From Hwy 11 via Ecclestone Drive<br>From Wellington Street                                                                | 95<br>5        | Need a turn lane from Cavalcade<br>Ford to Fanotech on Ecclestone<br>Drive.                                                                                 |
| Muskoka<br>Containerized Service       | 580 Ecclestone<br>Drive,<br>Bracebridge | 60                                 | 60  | 8                  | From West: Hwy 118 to<br>Wellington St. - Ecclestone Drive<br>From East: Hwy 11 to District<br>Road 4 to Ecclestone Drive | 40<br>60       | 1. Enforce speed limit past<br>our yard<br>2. Poor Entrance/Exit<br>configuration at Plaza<br>Southwest corner at Hwy<br>118/Wellington Street              |

## 6.0 RECOMMENDATIONS FOR TRAFFIC OPERATIONS IMPROVEMENTS

### 6.1 INTERSECTIONS

#### 6.1.1 Manitoba Street and Monck Road Intersection

As discussed in Section 5.1, the intersection of Manitoba Street and Monck Street is currently experiencing some operational problems during the noon and p.m. peak periods. In order to rectify problems at this location, it is recommended that a re-allocation of green time be undertaken through traffic signal timing revisions. It should be recognized that overall, this intersection is currently operating at Level of Service F during both peak hours although the volume to capacity ratios are below 0.60 which suggests that a re-allocation of green time can be accommodated. A suggested signal timing for this intersection for all periods is detailed below:

#### REVISED SIGNAL TIMING CYCLE LENGTH = 60 SECONDS

| MOVEMENT/PHASING         | GREEN (SEC) | AMBER (SEC) | ALL RED (SEC) |
|--------------------------|-------------|-------------|---------------|
| Southbound - Northbound  | 20.0        | 4.0         | 2.0           |
| Eastbound Advanced Green | 6.0         | 2.0         | 0.0           |
| Eastbound - Westbound    | 20.0        | 4.0         | 2.0           |

During the morning peak period, this intersection is currently operating at a satisfactory level of service.

## 6.1.2 Manitoba Street and Thomas Street Intersection

As previously noted, this intersection is currently realizing operational problems as a result of truck manoeuvres. Geometric constraints require that trucks encroach on opposing traffic lanes when making left and right turning. Although capacity analysis conducted for this intersection indicates that it is operating at a satisfactory level of service, such analysis does not recognize the problems that occur when trucks are attempting to manoeuvre at this intersection. Over the last year, the southbound left turn stop bar has been moved back from the intersection to provide trucks additional room to manoeuvre; however, field observations indicate that this improvement has not totally rectified the situation particularly when larger tandem axle or transport trucks are present. The truck turning movement problems are further exacerbated at this location by heavy pedestrian volumes which are prevalent on all cross-walks at this intersection. With respect to the truck turning movement problems, the solution at this location is to provide an alternate route around the intersection for heavy vehicles. Further discussion on this issue is contained in Section 6.3 of this report.

## 6.1.3 Wellington Street and Beaumont Drive Intersection

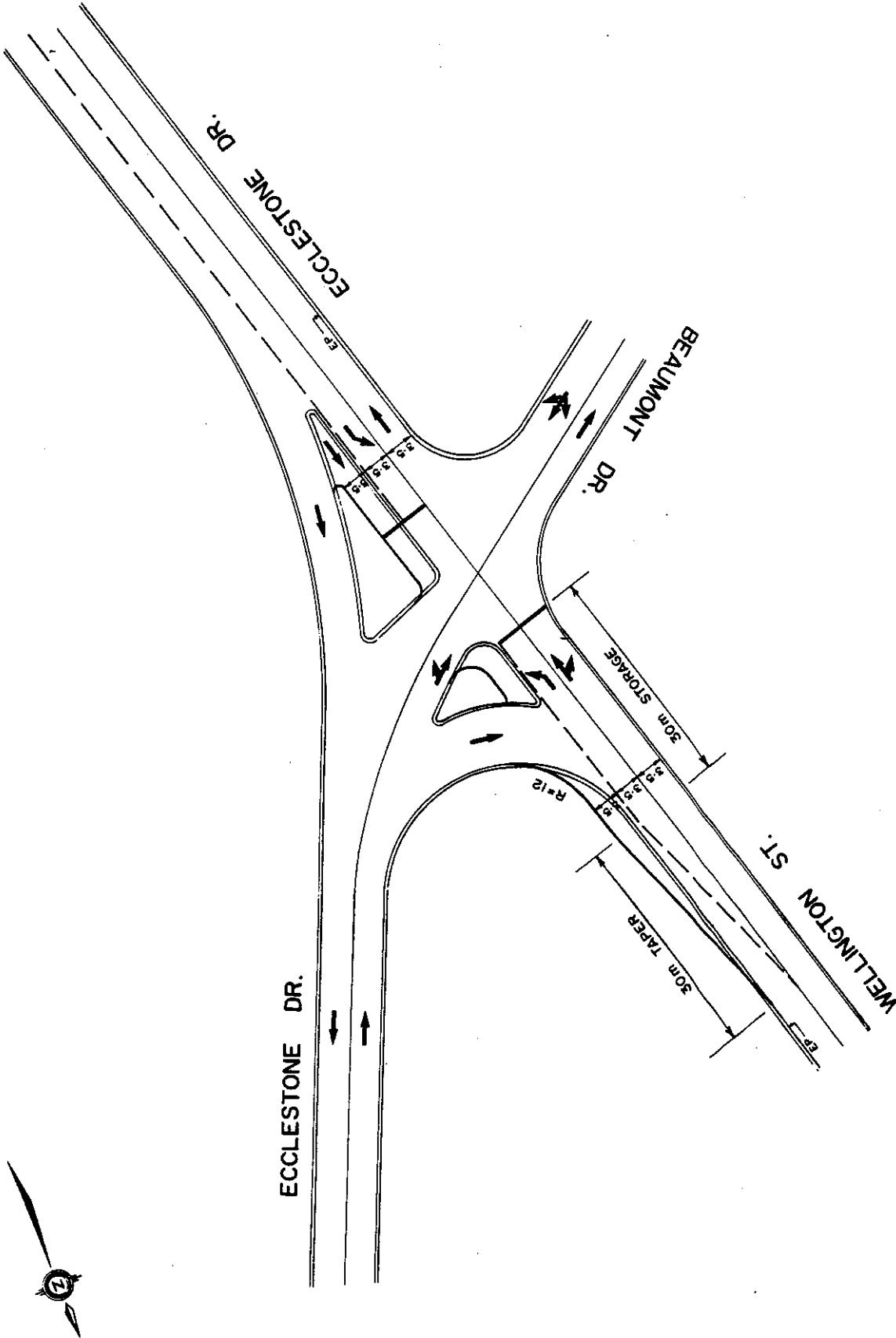
Although Table 2 appears to indicate that this intersection is operating at an acceptable level of service (D) during the p.m. peak hour (summer weekday volumes), it must be recognized that the southbound approach is operating with a volume to capacity ratio in excess of 1.0 or Level of Service F. Solutions to the problems at this location would include the provision of separate northbound and southbound left turn lanes. Exhibit 11 provides a preliminary design for implementation of the above mentioned improvements.

N.T.S.

JOHN S. HUBBARD ASSOCIATES  
ENGINEERS AND PLANNERS

TOWN OF BRACEBRIDGE  
TRANSPORTATION PLANNING STUDY

Proposed Improvements For  
Ecclestone Dr./Beaumont Dr.  
Intersection  
EXHIBIT No. 11



## 6.2 ROADWAY LINKS

### 6.2.1 Manitoba Street (District Road 37) from Ontario Street to Monck Road

Manitoba Street (District Road 37) in the Central Business District is currently operating at theoretical capacity between Thomas Street and Monck Road during the p.m. peak period on an average summer weekday. Theoretical analysis of existing traffic volumes combined with field observation confirmed that this is the area of most significant congestion in Bracebridge. The prevailing speeds along this roadway are slow, i.e. often less than 20 km per hour at some locations. Conditions are exacerbated by the numerous cross streets with entering and turning traffic, heavy pedestrian movements and significant on-street parking activity.

It is not often practical or desirable to effect major physical or operational roadway improvements to improve traffic flow or speed or to significantly increase the physical capacity of a roadway in a downtown area. It is not necessarily undesirable to have operating conditions which reflect Levels of Service D, E or even, during peak periods, Level of Service F. One possible low cost operational improvement which could provide additional capacity would involve the removal of all on-street parking along Manitoba Street during peak periods. Given existing parking conditions within the area (i.e. very high parking occupancy rates) removal of on-street parking, although a low cost initiative, may place undue hardship upon the adjacent businesses.

**Traffic volumes on Manitoba Street are high for several reasons:**

- **It serves the major commercial and business area within the community;**
- **It represents one of the two main or south arteries used by commuters and cottage country traffic; and**
- **It represents a portion of the major east-west link through the Town.**

Without undertaking considerable physical or operational improvements, the volumes on Manitoba Street could be reduced through the provision of additional capacity on alternate routes around the downtown area. As noted in previous studies, including the 1987 Operations Study, a route connecting the downtown to Wellington Street has been identified as a desirable addition to the road network and such a route would reduce the traffic on Manitoba Street; however, the prevailing topography, road network and land use do not lend themselves to development of such a route. Discussion of an additional alternative employing Main Street, Hiram Street and McDonald Street is contained in Section 6.3.

Although it is not considered appropriate to undertake major physical or operational improvements on Manitoba Street, there are existing local problem areas that can be rectified through minor operational changes. For example, field observation revealed that vehicles turning to and from Manitoba Street to Dominion Street were causing long queues and excessive congestion on Manitoba Street. TSH staff regularly observed traffic backing up from Dominion Street through the Thomas Street intersection during peak traffic periods. In order to rectify this situation, there are two possibilities: the first is to remove several parking stalls on the east side of Manitoba Street to permit the designation of separate northbound left turn and through lanes at the Dominion Street

intersection. The second potential solution is to simply restrict northbound left turns at the intersection. In order to retain as many parking stalls as possible on Manitoba Street, it is recommended that the District consider the implementation of a northbound to westbound left turn restriction at the intersection of Manitoba Street and Dominion Street. Given the heavy traffic volumes that occur all day during summer periods, it is recommended that this left turn restriction be in force for a 24 hour period on weekdays and weekends; as a *minimum* a left turn restriction should be implemented from 7:00 a.m. to 6:00 p.m..

## 6.2.2 Wellington Street (District Road 4) from Dill Street to Monck Road

As previously noted in Section 5.1, the section of Wellington Street between Dill Street and Monck Road is currently operating at capacity. Contributing to the problems on Wellington Street are the number of residential and commercial driveways and numerous intersecting roadways. Wellington Street is a two lane undivided roadway under the jurisdiction of the District of Muskoka.

Existing capacity constraints and local operational problems along Wellington Street could be rectified through the implementation of a two-way centre left turn lane from north of Muskoka River to Monck Road. Such an installation would require a minor widening on one side of the roadway to provide the necessary pavement width. With the centre left turn lane in place, Wellington Street could have enough capacity to handle traffic growth for between 10 and 15 years. This assumes an average traffic growth on this roadway of approximately 2% per annum (historic growth). The two-way centre left turn lane would increase the capacity on Wellington Street by removing left turning traffic from the through traffic flow. Beyond the 10 to 15 year planning horizon, consideration should be given to either widening Wellington Street to a four lane cross-section or constructing an alternate parallel route to provide north-south capacity through the community. This issue is further discussed in more detail in the Transportation Planning portion of this document.

Although this report acknowledges that implementation of a two-way centre left turn lane would provide the capacity enhancement on Wellington Street, it's success is dependent upon several issues:

- The ability of local residents and cottagers to adapt to operating conditions associated with a two-way centre left turn lane; and
- That traffic volumes will increase at a rate assumed as part of this Study, i.e. approximately 2% per annum.

The approval of major developments in the area of Wellington Street, not considered within the context of this Study, could result in additional traffic generation which may accelerate the need for either a widening of Wellington Street or the provision of alternate north-south capacity in the community. Consequently, it is recommended that, whether or not a two-way centre left turn lane is implemented, volumes on Wellington Street be assessed on a bi-annual basis and that traffic impact studies be undertaken for future developments as discussed in Section 11.0 of this report.

### 6.3 TRUCK OPERATIONS

As noted in Section 5.2, the Town is currently experiencing problems relating to truck traffic operations on Manitoba Street and in particular, at the intersection of Manitoba Street with Thomas Street. The main issue involving trucks relates to difficulties encountered turning at the Manitoba Street/Thomas Street intersection. Currently, all heavy vehicles must use this intersection when travelling either eastbound or westbound through the urban area. During the p.m. peak hour, truck/commercial vehicle volumes at the Manitoba Street/Thomas Street intersection represent approximately 2% of the total traffic at this location. This percentage of commercial vehicle traffic is well within the standards for arterial facilities i.e. up to 20% trucks; however, even the low volume of commercial vehicles results in unnecessary congestion and traffic queues.

A solution to truck problems experienced at this location involves the designation of an *alternate vehicle route* created by Main Street, Hiram Street and McDonald Street which would "provide" an alternate route around the downtown between Monck Road and Thomas Street. Such a route could be utilized, not only by commercial vehicles but also by motorists wishing to circumvent congestion in the downtown area. It should be recognized that field observations indicate that some motorists are using this route at the present time even though it is not clearly marked as an alternate route.

In order to increase the amount of traffic using this route, signs should be erected informing motorists and truck operators of an alternate route around the downtown. It may also be prudent for the Town to consider amending its Traffic Bylaw to permit the designation of a Truck Route Network. Following the installation of advisory signs, the intersection of Main Street and Thomas Street should be monitored to determine whether or not any increase in traffic may require improvements to existing traffic controls. Although the proposed route physically exists today, it has a number of geometric deficiencies. As drawings for this roadway were not available for this Study, specific recommendations regarding necessary improvements cannot be identified at this time. Consequently, it is recommended that the Town, in conjunction with, the District undertake a review of roadways and intersections comprising this route to determine what geometric improvements could be effected in order to make this facility more attractive to motorists and commercial vehicles.

#### 6.4 ON-STREET PARKING ISSUES

On-street parking problems on Manitoba Street include double parking and double parking by commercial vehicles for the purposes of unloading and loading. Solutions to these problems include continued and enhanced enforcement of all parking regulations on Manitoba Street. Enforcement of on-street parking restrictions in the downtown area should be a high priority for the Town of Bracebridge and the District Municipality of Muskoka. Existing conditions significantly affect the capacity of intersections in the downtown and hinder turning movements at all cross street intersections. Of particular note is the observance of continued illegal parking on Manitoba Street in the area of the Manitoba Street/Thomas Street intersection.

## 6.5 SIGNING AND PAVEMENT MARKINGS

Pavement markings promote safe and proper vehicular operation at both signalized and unsignalized intersections and can have an effect on intersection and roadway capacity. At signalized intersections, the following markings are considered critical:

- Stop bars;
- Crosswalks;
- Directional and lane dividing lines;
- Parking stalls/areas; and
- Lane designations or directional arrows.

Directional arrows are critical at approaches to intersections where designations must be reinforced. At major unsignalized intersections controlled by stop signs on one or more legs, critical markings include stop bars on the approaches under stop control and 7.5 m of directional dividing line. At signalized intersections and school crossing zones any cross walk should be a minimum of 1.5 m wide.

Traffic signs generally have a life expectancy of 5 to 6 years before repair replacement is required. The Town of Bracebridge and the District Municipality of Muskoka should establish replacement program to ensure that each sign is inventoried and is inspected on an annual basis and replaced every 5 to 6 years, if necessary. Consequently, it is recommended that both jurisdictions undertake a sign inventory for budget preparation, maintenance management and legal reasons.

## 6.6 VEHICLE SPEEDS

Floating car surveys indicated that speeding is not a significant problem adjacent to existing schools; however, it is recommended that all roadways adjacent to schools be monitored on a regular basis.

## **7.0 MAJOR TRANSPORTATION PLANNING ANALYSIS AND RECOMMENDATIONS - Provisions for Growth**

The Town of Bracebridge anticipates some growth in both residential and commercial/industrial development over the next 20 year period. The traffic resulting from this growth will be a significant component of future traffic volumes. For the purposes of this Study, the following horizon years were assessed: 1996, 2001, and 2011

Future traffic volumes are a combination of background traffic and traffic specifically generated by population and employment growth within or adjacent to the community. The background traffic component consists of current traffic on the network.

In addition to assessing the impact of general growth within the community, the Steering Committee members and staff of the Town and District requested that a review of future transportation requirements include consideration of the following specific issues:

- The need for an additional arterial roadway to be located to the west of Wellington Street (District Road 37) connecting the intersection of Highway 118 and Highway 11 with Highway 118 west of the urban area;
- The need for a northerly arterial roadway north of the existing urban area which recognizes the inability to provide an east-west arterial route north of Toronto Street; and
- A review of potential interchange locations on Highway 11 between Highway 118 and District of Muskoka Road 42.

## 7.1 DEVELOPMENT OF FUTURE TRAFFIC VOLUMES FOR THE STUDY AREA

### 7.1.1 General Methodology

The following represents a synopsis of the methodology employed to identify future traffic demands for the Study Area:

- Identification of existing and future demographics, i.e. population and employment;
- Identification of existing trip making characteristics of residents within and external to the Study Area, i.e. development of existing trip interchange table;
- Calibration of traffic assignment model, i.e. replication of existing traffic conditions within the Study Area, and;
- Identification of future travel patterns/demand, i.e. development of future trip interchange tables and subsequent assignment of traffic volumes for future planning horizons to various network alternatives.

In terms of the specific study period analysed within the context of this review, the p.m. peak hour was selected to be modelled as this period generally reflects worst case conditions on the roadway network. Given the nature of traffic volumes within and adjacent to the Town of Bracebridge where traffic levels are somewhat higher during the summer months due to a significant amount of recreational and tourist traffic, it was agreed with Steering Committee members that the duration of these higher traffic volumes could justify the use of average summer volumes (SAWT and/or SADT) to assess future traffic conditions. In terms of assessing trips made during the p.m. peak hour, it should be recognized that trips made during this period are far more diversified in terms of trip purpose and destination, due to the synergistic effect of home-based work trips, shopping trips and external trips passing through the Study Area. Because of the nature

of development within and adjacent to the Study Area, traffic volumes and patterns are somewhat more difficult to predict than volumes in other urban and rural environments. It was observed during the course of this Study, and in particular, during traffic count periods, that weather conditions greatly affected the level and nature of traffic within and passing through the Study Area. For example, on an average summer weekday on rainy or cold days, the volumes of traffic within the Town and on roadway links into and out of the urban area are greater than on days when the weather is fair and warm. This is a result of cottagers taking advantage of rainy or cold days to come into the urban area to shop, to eat and to complete personal business, etc. *As a result of this variability in traffic volumes and patterns, it was difficult to simulate or replicate existing traffic volumes.*

For the purposes of this Study, the Study Team used the EMME II software to perform an equilibrium traffic assignment for both existing and future conditions. The EMME II model is a proven transportation planning tool that simplifies a process of traffic assignment and allows for the evaluation of numerous network alternatives.

## 7.1.2 Study Area Demographics/Land Use Context

As previously mentioned, the generation of future traffic volumes is based on anticipated residential and employment growth within the Study Area, Tables 7 through 9 shows existing and future population and employment projections for the 1991, 2001 and 2011 planning horizons as developed by TSH in conjunction with input from Town and District staff. Population and employment projections were formulated using general growth patterns as depicted in Official Plan and associated Official Plan Amendments. Population and employment forecasts by traffic zone are depicted in Exhibit 12. The Official Plan and associated

**Table 7**  
**Town of Bracebridge Transportation Study**  
**Summary Of 1991 Population/Employment**

| ZONES | POPULATION | NUMBER OF<br>HOUSEHOLDS | EMPLOYMENT |            | TOTAL         |
|-------|------------|-------------------------|------------|------------|---------------|
|       |            |                         | RETAIL     | NON-RETAIL |               |
| 1     | 981        | 381                     | 14         | 124        | 138           |
| 2     | 386        | 150                     | 35         | 311        | 346           |
| 3     | 556        | 214                     | 31         | 73         | 104           |
| 4     | 100        | 39                      | 10         | 94         | 104           |
| 5     | 1800       | 700                     | 83         | 332        | 415           |
| 6     | 250        | 97                      | 35         | 311        | 346           |
| 7     | 450        | 175                     | 52         | 52         | 104           |
| 8     | 700        | 272                     | 190        | 190        | 380           |
| 9     | 550        | 214                     | 4          | 32         | 36            |
| 10    | 960        | 374                     | 304        | 457        | 761           |
| 11    | 900        | 350                     | 187        | 124        | 311           |
| 12    | 10         | 4                       | 52         | 467        | 519           |
| 13    | 447        | 174                     | 59         | 529        | 588           |
| 14    | 1600       | 639                     | 343        | 246        | 589           |
| 15    | 899        | 350                     | 166        | 387        | 553           |
| 16    | 500        | 195                     | 41         | 97         | 138           |
| 17    | 40         | 16                      | 31         | 280        | 311           |
|       |            |                         |            |            | <b>11,129</b> |
|       |            |                         |            |            | <b>4,344</b>  |
|       |            |                         |            |            | <b>1,637</b>  |
|       |            |                         |            |            | <b>4,106</b>  |
|       |            |                         |            |            | <b>5,743</b>  |

# Town of Bracebridge Transportation Study

## Summary Of 2001 Population/Employment Forecasts

Table 8

| ZONES | POPULATION | NUMBER OF HOUSEHOLDS | EMPLOYMENT |            | TOTAL |
|-------|------------|----------------------|------------|------------|-------|
|       |            |                      | RETAIL     | NON-RETAIL |       |
| 1     | 1105       | 487                  | 15         | 135        | 150   |
| 2     | 425        | 187                  | 41         | 371        | 412   |
| 3     | 599        | 264                  | 34         | 78         | 112   |
| 4     | 186        | 82                   | 19         | 168        | 187   |
| 5     | 1827       | 805                  | 90         | 359        | 449   |
| 6     | 307        | 135                  | 37         | 337        | 374   |
| 7     | 477        | 210                  | 56         | 65         | 121   |
| 8     | 768        | 338                  | 206        | 206        | 412   |
| 9     | 910        | 401                  | 4          | 32         | 36    |
| 10    | 991        | 437                  | 314        | 472        | 786   |
| 11    | 1124       | 495                  | 269        | 180        | 449   |
| 12    | 10         | 4                    | 56         | 506        | 562   |
| 13    | 493        | 217                  | 67         | 607        | 674   |
| 14    | 1802       | 813                  | 423        | 288        | 711   |
| 15    | 944        | 416                  | 157        | 367        | 524   |
| 16    | 543        | 239                  | 45         | 105        | 150   |
| 17    | 45         | 19                   | 37         | 337        | 374   |
| TOTAL |            |                      | 1,870      | 4,613      | 6,483 |

Table 9

Town of Bracebridge Transportation Study

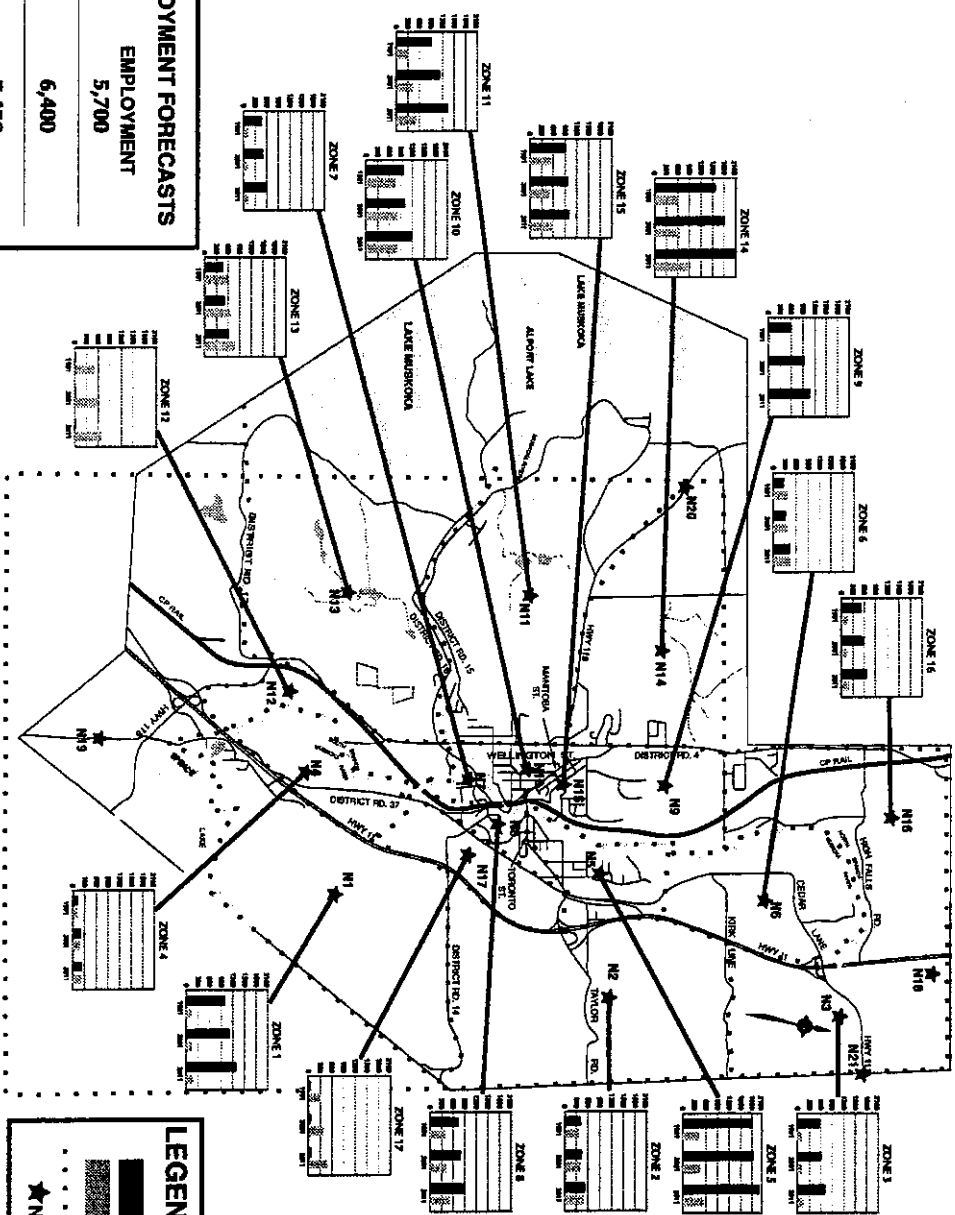
Summary Of 2011 Population/Employment Forecasts

| ZONES | POPULATION | NUMBER OF HOUSEHOLDS | EMPLOYMENT |            | TOTAL |
|-------|------------|----------------------|------------|------------|-------|
|       |            |                      | RETAIL     | NON-RETAIL |       |
| 1     | 1272       | 578                  | 17         | 156        | 173   |
| 2     | 500        | 227                  | 48         | 428        | 476   |
| 3     | 713        | 324                  | 39         | 91         | 130   |
| 4     | 203        | 92                   | 22         | 194        | 216   |
| 5     | 2014       | 915                  | 104        | 415        | 519   |
| 6     | 424        | 192                  | 43         | 389        | 432   |
| 7     | 575        | 261                  | 65         | 65         | 130   |
| 8     | 898        | 408                  | 238        | 238        | 476   |
| 9     | 1046       | 475                  | 4          | 32         | 36    |
| 10    | 1155       | 525                  | 320        | 480        | 800   |
| 11    | 1322       | 601                  | 311        | 208        | 519   |
| 12    | 10         | 4                    | 60         | 623        | 683   |
| 13    | 570        | 259                  | 78         | 700        | 778   |
| 14    | 2074       | 966                  | 489        | 333        | 822   |
| 15    | 986        | 448                  | 182        | 424        | 606   |
| 16    | 638        | 290                  | 52         | 121        | 173   |
| 17    | 52         | 23                   | 48         | 428        | 476   |
|       |            |                      |            |            | 7,445 |



# TOWN OF BRACEBRIDGE TRANSPORTATION STUDY TRAFFIC ZONE SYSTEM POPULATION AND EMPLOYMENT FORECASTS - GROWTH AREAS

| POPULATION & EMPLOYMENT FORECASTS |            |            |
|-----------------------------------|------------|------------|
|                                   | POPULATION | EMPLOYMENT |
| 1991                              | 11,100     | 5,700      |
| 2001                              | 12,550     | 6,400      |
| 2011                              | 14,450     | 7,450      |



**LEGEND**

POPULATION

EMPLOYMENT

TRAFFIC ZONE BOUNDARY

TRAFFIC ZONE NUMBERING SYSTEM

Amendments which have been adopted by the Town of Bracebridge following public input and endorsement, cover a significant amount of the Study Area considered within the context of this Study and reflects the Town's "Vision" for future growth. Exhibit 13 shows the areas covered by the Official Plan and Official Plan Amendments.

#### 7.1.3 Traffic Zone System

Population and employment has been apportioned using a traffic zone system established for the purposes of this study. The zone system, including internal Study Area and external zones is shown in Exhibit 14. Twenty-one (21) traffic zones were established for the use in this particular study. The zone system represents a grouping of similar land uses and also coincides to the greatest extent possible with physical boundaries in the Study Area such as railway tracks, rivers and major roadways. In defining the traffic zone system, care was taken to ensure that the level of detail was such that any potential change in land use could be properly assessed. In order to apply the traffic assignment model, each zone within the Study Area was designated by a centroid. The centroid represents the origin/destination for all trips going to or coming from a particular zone. Centroid connectors attach centroids to the highway or roadway network. The determination of the location and number of connectors assigned to each centroid are somewhat arbitrary and requires considerable professional judgment.

#### 7.1.4 Existing Trip Making Characteristics

From the surveys described in the data collection activity section of this document, the existing travel characteristics pertaining to the Study Area were determined. These characteristics described the circumstances under which a trip is made and includes the purpose, mode of travel and the origin/destination. Table 10 below provides a summary of the key trip making characteristics for the area.

[illegible]

- EXHIBIT No. 13**



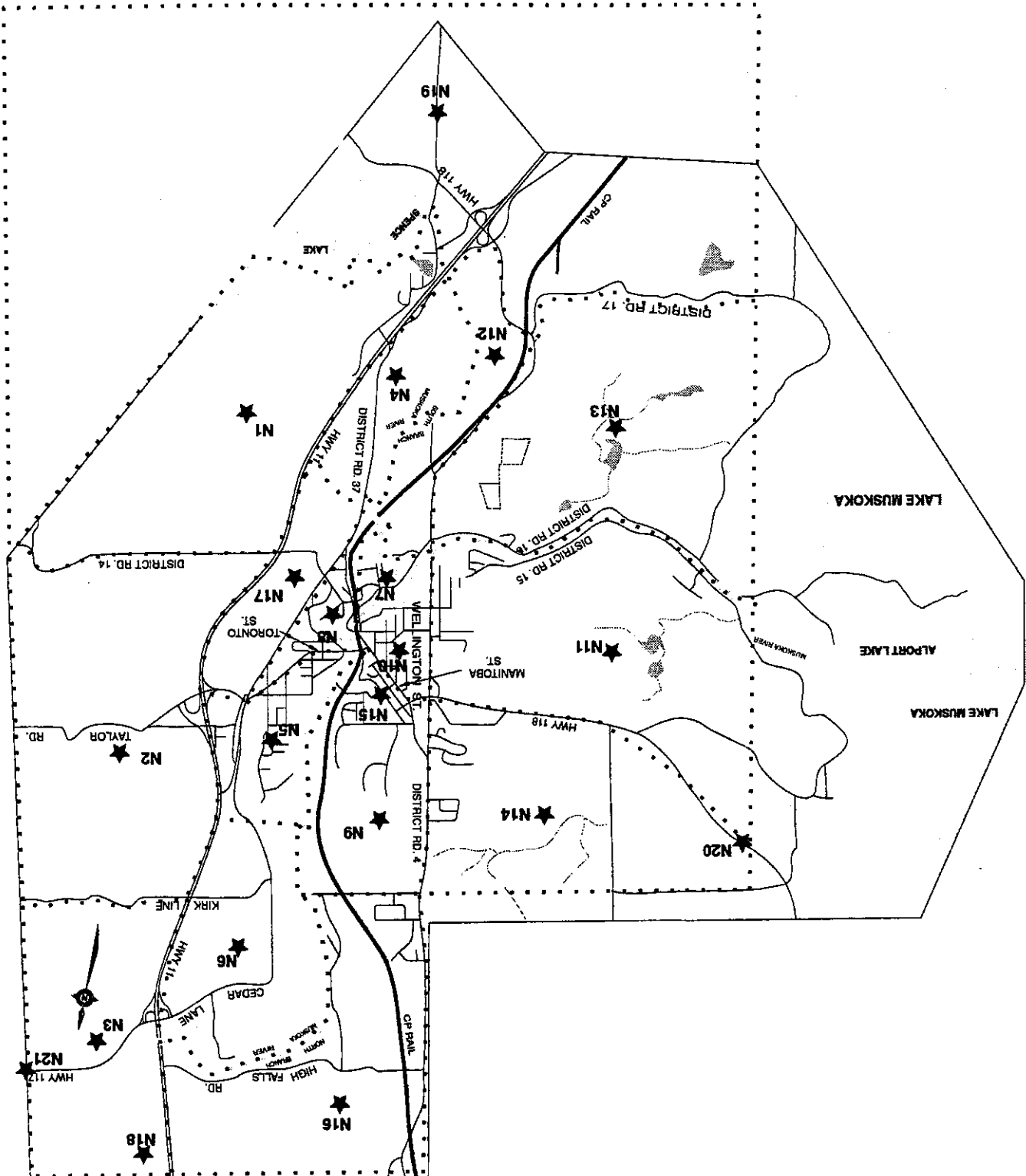
Jotter Sims Hubicki Associates  
ENGINEERS ARCHITECTS AND PLANNERS

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

EXHIBIT No. 14

21 TRAFFIC ZONE SYSTEM

NOT TO SCALE



| TABLE 10<br>TRIP MAKING CHARACTERISTICS - TOWN OF BRACEBRIDGE<br>P.M. PEAK HOUR OF ADJACENT STREET SYSTEM |                 |            |
|-----------------------------------------------------------------------------------------------------------|-----------------|------------|
| TRIP TYPE                                                                                                 | VOLUME (VEH/HR) | PERCENTAGE |
| Internal - Internal                                                                                       | 2,903           | 57%        |
| Internal - External                                                                                       | 1,277           | 25%        |
| External - External                                                                                       | 917             | 18%        |
| TOTAL                                                                                                     | 5,097           | 100%       |

In transportation planning, individual trips are often classified by the purpose of the trip and the trip origin. For small urban areas, such as Bracebridge, three categories of trips have been successfully used, home-based work, home-based other and non-home-based trip modes. These categories could be defined as:

**Home-Based Work (HBW)** - Describes the work trip which either begins or ends at home.

**Home-Based Other (HBO)** - Describes a trip which either begins or ends at home but neither begins nor ends at work.

**Non-Home-Based (NHB)** - Describes a trip which neither begins nor ends at home. It should be recognized that travel by the residents of the Town of Bracebridge is primarily orientated to automobiles (defined as cars - light trucks - vans). Based upon the interview surveys conducted in Town, approximately 90% of all person trips are made either as vehicle drivers or passengers during the afternoon peak hour. As previously noted, very few trips are made by transit within the Town and those trips that are made, are made by visitors. Approximately 10% of all trips during the p.m. peak hour appear to be made on foot or bicycle.

Table 11 provides an existing trip interchange table for the Town of Bracebridge Transportation Study for the p.m. peak hour during average summer weekday conditions. This Table provides a summary of trip interchanges between each zone established within and external to the Study Area and represents a summary of trip distribution within the community.

The trip table was derived using the following general process:

- External to external and internal-external trip estimates and interchange patterns (distribution) were obtained from the TSH and MTO Origin-Destination surveys conducted in the community;
- Estimates of internal trip making and trip distribution was based upon the interview surveys and employer/employee information collected by TSH;
- Separate trip matrices or interchange tables were created for HBW, NHB and HBO trips;
- The total of internal-internal and internal-external trips was compared to overall expected trip making characteristics for the community using an average trip generation index of approximately 1.0 vehicle trips per dwelling unit. This figure was based upon the following:
  - Surveys of residents of the Town;
  - Information assembled by TSH from previous transportation planning studies undertaken in Ontario; and
  - The Institute of Transportation Engineers Trip Generation Manual, 5th Edition.
- A comparison of total anticipated trips (4,300 dwelling units x 1 vehicle trip/household = 4,300 p.m. peak hour vehicle trips) to the trip generation as articulated in the trip interchange matrix (internal-internal and internal-external trips only - 4,200 p.m. peak hour vehicle trips) revealed only a marginal difference i.e.  $\pm 2.4\%$ ; and

**Town of Bracebridge Transportation Study  
EXISTING P.M. PEAK HOUR TRIP TABLE (ALL PURPOSE)**

Table 11

|             |    | DESTINATION ZONES |    |   |     |     |     |     |     |     |     |     |    |     |     |    |    |     |     |     |     | TOTAL |     |     |
|-------------|----|-------------------|----|---|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|-----|-----|-------|-----|-----|
|             |    | 1                 | 2  | 3 | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12 | 13  | 14  | 15 | 16 | 17  | 18  | 19  | 20  | 21    |     |     |
| O R I G I N | 1  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 13  | 13  | 13  | 0  | 0   | 13  | 26 | 0  | 0   | 4   | 8   | 18  | 1     | 109 |     |
|             | 2  | 0                 | 0  | 0 | 0   | 33  | 0   | 0   | 5   | 6   | 13  | 11  | 4  | 0   | 23  | 19 | 19 | 0   | 4   | 3   | 11  | 1     | 162 |     |
|             | 3  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 12  | 6   | 3   | 0  | 0   | 5   | 16 | 0  | 0   | 17  | 1   | 7   | 0     | 67  |     |
|             | 4  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 2   | 1   | 0   | 0  | 0   | 1   | 2  | 0  | 0   | 0   | 25  | 0   | 0     | 31  |     |
|             | 5  | 0                 | 0  | 0 | 0   | 40  | 0   | 4   | 8   | 34  | 39  | 19  | 0  | 0   | 42  | 55 | 4  | 0   | 17  | 10  | 18  | 2     | 292 |     |
|             | 6  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 2   | 4   | 2   | 0  | 0   | 4   | 6  | 0  | 0   | 4   | 2   | 7   | 0     | 31  |     |
|             | 7  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 18  | 0   | 105 | 0  | 0   | 102 | 18 | 0  | 0   | 0   | 2   | 4   | 0     | 246 |     |
|             | 8  | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 3   | 16  | 9   | 0  | 0   | 12  | 12 | 0  | 0   | 3   | 55  | 15  | 1     | 128 |     |
|             | 9  | 2                 | 2  | 0 | 2   | 14  | 2   | 0   | 4   | 100 | 33  | 11  | 2  | 4   | 37  | 24 | 2  | 9   | 0   | 1   | 0   | 0     | 248 |     |
|             | 10 | 4                 | 9  | 2 | 2   | 38  | 9   | 20  | 21  | 38  | 48  | 30  | 7  | 9   | 49  | 41 | 8  | 4   | 30  | 18  | 36  | 3     | 428 |     |
| Z O N E S   | 11 | 2                 | 4  | 2 | 0   | 14  | 4   | 2   | 9   | 24  | 35  | 21  | 4  | 4   | 32  | 32 | 4  | 2   | 13  | 160 | 18  | 1     | 367 |     |
|             | 12 | 0                 | 0  | 0 | 0   | 45  | 0   | 5   | 4   | 1   | 6   | 12  | 1  | 0   | 15  | 8  | 5  | 0   | 7   | 2   | 4   | 0     | 115 |     |
|             | 13 | 0                 | 0  | 0 | 0   | 155 | 0   | 18  | 28  | 15  | 27  | 27  | 9  | 0   | 82  | 54 | 12 | 5   | 4   | 5   | 11  | 1     | 453 |     |
|             | 14 | 4                 | 9  | 2 | 2   | 24  | 9   | 4   | 17  | 60  | 51  | 29  | 7  | 9   | 51  | 67 | 7  | 4   | 17  | 155 | 15  | 1     | 544 |     |
|             | 15 | 2                 | 77 | 2 | 2   | 55  | 7   | 6   | 14  | 29  | 37  | 32  | 6  | 7   | 42  | 40 | 6  | 4   | 29  | 52  | 40  | 4     | 460 |     |
|             | 16 | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 0   | 14  | 7   | 0  | 0   | 14  | 7  | 0  | 0   | 0   | 0   | 0   | 0     | 42  |     |
|             | 17 | 0                 | 0  | 0 | 0   | 0   | 0   | 0   | 0   | 2   | 0   | 0   | 0  | 0   | 0   | 2  | 0  | 0   | 1   | 2   | 4   | 0     | 11  |     |
|             | 18 | 4                 | 5  | 3 | 0   | 5   | 3   | 0   | 3   | 0   | 9   | 5   | 2  | 2   | 3   | 5  | 8  | 0   | 0   | 0   | 260 | 27    | 9   | 352 |
|             | 19 | 8                 | 2  | 2 | 1   | 9   | 2   | 1   | 69  | 1   | 18  | 38  | 2  | 5   | 36  | 24 | 0  | 2   | 366 | 0   | 79  | 15    | 680 |     |
|             | 20 | 4                 | 2  | 2 | 0   | 5   | 2   | 60  | 4   | 0   | 9   | 4   | 1  | 3   | 4   | 11 | 0  | 1   | 25  | 42  | 0   | 34    | 213 |     |
| TOTAL       | 31 | 111               | 15 | 9 | 435 | 38  | 120 | 187 | 360 | 382 | 319 | 45  | 45 | 570 | 476 | 67 | 32 | 650 | 618 | 350 | 73  | 5097  |     |     |

- Initial percentage splits between HBW, NHB and HBO trips were obtained from the Transportation Research Program Report 187 entitled "Quick Response Urban Travel Estimation and Transferable Parameters". These percentages were modified and total trip interchange patterns tested to achieve network and link calibration (see Section 7.1.5).

## 7.1.5 Calibration of Traffic Assignment Model

As previously discussed, a modelling technique was used in the Study to assign traffic to existing and future road networks. The EMMF II software was used to perform an equilibrium assignment. When interpreting or reviewing the results of the traffic assignment model used in this particular Study, the following limitations should be noted:

- The model provides information which is valuable in comparing, in broad terms, the impact of future growth along corridors, across screenlines or cordon lines; and
- The traffic assignment model cannot be employed to assess specific proposals such as an individual development or a series of developments along a roadway.

This is true of all traffic/transportation models regardless of their sophistication. It is fundamental to recognize that the traffic assignment model is a tool to be used to assess the impact of broad growth within the community. With respect to the Town of Bracebridge Transportation Study, the forecasts and assignments produced by the model have been applied in a manner which minimizes the impact of the modelling limitations and provides as realistic a basis as possible for the evaluation of transportation network alternatives.

in order to test the validity of the model and the accuracy of the data contained in the trip table (Table 11) produced through an analysis of surveys and interviews, a calibration process was undertaken to compare the assignment of the 1991 trip interchange table volumes to actual volumes on the existing road network. This was undertaken to provide a comparison of modelled trips to measured values which were derived from the results of intersection counts and automatic counts undertaken within the Study Area. The results of the comparison of modelled versus actual volumes are provided in Table 12. The existing (and future) roadway network assessed within the context of the Town of Bracebridge Transportation Study included only arterial and collector standard roadways. No attempt was made to assess traffic flow on local roadways within the Study Area. *Generally, it can be concluded that an acceptable level of network calibration was achieved as part of the Study.* Some differences between observed and actual link volumes can be attributed to:

- The location of centroid connectors; and
- The accuracy of actual traffic counts.

#### 7.1.6 Future Trip Making Characteristics

Overall trip generation and trip distribution in the future were assumed to remain generally unchanged from existing conditions. Trip interchanges were developed for the 1991, 2001 and 2011 planning horizons through the application of growth factors to the existing trip interchange table; the growth factors employed relate directly to changes between existing and future demographics within the Study Area. An iterative procedure known as "furness" process was to adjust existing trip interchange values to reflect population and employment growth in the Study Area. A separate growth factor was applied to external trips (2.5% per annum) to generate future external trips to the Study Area. Table 13 provides a summary of the increase in total trips between 1991 and 2011 planning horizons for the p.m. peak hour.

Table 12

**Town of Bracebridge Transportation Study  
Summary Of Base Year Network Calibration  
(P.M. Peak Hour)**

| LOCATION REFERENCE | LINK                             |                                  | OBSERVED<br>TRAFFIC<br>(veh/hr) | SIMULATED<br>TRAFFIC<br>(veh/hr) | PERCENT<br>DEVIATION | ALLOWABLE<br>DEVIATION<br>(%) |
|--------------------|----------------------------------|----------------------------------|---------------------------------|----------------------------------|----------------------|-------------------------------|
|                    | FROM                             | TO                               |                                 |                                  |                      |                               |
| North              | North<br>Study Area              | Study Area<br>North              | 340<br>437                      | 352<br>548                       | 4<br>25              | 40~45                         |
|                    | Main Street<br>Bird Lane         | Bird Lane<br>Main Street         | 554<br>491                      | 623<br>478                       | 12<br>-3             | 30~35                         |
|                    | Hwy 11<br>Bracebridge Road       | Bracebridge Road<br>Hwy 11       | 240<br>286                      | 301<br>259                       | 25<br>-9             | 30~35                         |
| District Road 14   | Hwy 11<br>Muskoka Road           | Muskoka Rd<br>Hwy 11             | 90<br>45                        | 108<br>58                        | 20<br>29             | 50~55                         |
| District Road 37   | Queen Street<br>Manitoba Street  | Manitoba Street<br>Queen Street  | 389<br>218                      | 168<br>186                       | -56<br>-15           | 40~45                         |
|                    | Hugh Campbell Drive<br>Hwy 11    | Hwy 11<br>Hugh Campbell Drive    | 136<br>170                      | 156<br>161                       | 15<br>5              | 45~50                         |
| District Road 16   | Shaw Street<br>Ontario Street    | Ontario Street<br>Shaw Street    | 321<br>254                      | 320<br>50                        | 0<br>-80             | 35~40                         |
| Wellington Street  | Beaumont Drive<br>Garden Street  | Garden Street<br>Beaumont Drive  | 431<br>448                      | 540<br>453                       | 25<br>1              | 30~35                         |
|                    | North Street<br>Monck Road       | Monck Road<br>North Street       | 586<br>528                      | 596<br>507                       | 2<br>4               | 30~35                         |
|                    | West Study Limit<br>Balls Drive  | Balls Drive<br>West Study Limit  | 211<br>267                      | 213<br>350                       | 1<br>31              | 40~45                         |
| Highway 118        | West<br>West Study Limit         | West Study Limit<br>West         | 252<br>303                      | 213<br>350                       | -15<br>15            | 40~45                         |
|                    | Ida Street<br>Ann Street         | Ann Street<br>Ida Street         | 585<br>593                      | 568<br>526                       | -3<br>-11            | 25~30                         |
| District Road 4    | Westvale Drive<br>McCrack Drive  | McCrack Drive<br>Westvale Drive  | 395<br>233                      | 365<br>222                       | 8<br>5               | 35~40                         |
|                    | Winhara Road<br>District Road 17 | District Road 17<br>Winhara Road | 296<br>408                      | 403<br>375                       | 36<br>8              | 35~40                         |
|                    | South<br>Study Area              | Study Area<br>South              | 665<br>758                      | 680<br>818                       | 2<br>8               | 25~30                         |

Note: The range for allowable deviation should only be used as a guideline. The acceptable deviation is higher on low volume links where a large percentage deviation will not have major design implications. The converse is true on higher volume facilities.

| TABLE 13<br>TOTAL TRIP COMPARISON 1991-2011 - P.M. Peak Hour |                              |                                   |                                   |                                   |
|--------------------------------------------------------------|------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| INCREASE IN<br>TOTAL TRIPS<br>1991-2011                      | PERCENT<br>INCREASE<br>TRIPS | PERCENT<br>INCREASE<br>HOUSEHOLDS | PERCENT<br>INCREASE<br>POPULATION | PERCENT<br>INCREASE<br>EMPLOYMENT |
| 2,491                                                        | 32.8                         | 35                                | 23                                | 23                                |

## 7.1.7 Assignment of Future Traffic to Existing Network

As previously discussed, a major objective of the study was to identify future transportation requirements for a 20 year planning horizon; consequently, future projected trip interchange volumes for the 2011 planning horizon were assigned to the existing network to identify future problem areas.

Predicted problem areas at the 2011 planning horizon include:

- Capacity constraints on Wellington Street and District Road 4 from Highway 11 to Monck Road;
- Intersection capacity problems at District Road 4 and Beaumont Drive (District Road 16);
- Capacity constraints on Manitoba Street from Ontario Street to Monck Road; and
- Screenline capacity problems on Screenline B-B (see Exhibit 10).

It is fundamental to recognize that a problem is defined by any link in the network where the volume to capacity ratio exceeds 0.9, i.e. entering Level of Service E. This is consistent with parameters used in similar transportation planning studies.

In general, at the 2011 planning horizon, the existing network appears to lack sufficient capacity on critical north-south and to a lesser extent east-west links. This statement also holds true, although to a lesser extent, for the existing, 1996 and the 2001 planning horizons.

Table 14 provides a summary of projected 1996, 2001 and 2011 traffic volumes on key links within the Study Area assuming no changes to the existing network.

## 7.2 POTENTIAL IMPROVEMENT ALTERNATIVES

Exhibit 15 identifies improvement alternatives considered within the context of the Town of Bracebridge Transportation Study for the 2011 planning horizon. These alternatives were generated as a result of:

- Input from the public including local business representatives;
- Input from Town and District staff;
- Input from MTO staff;
- A review of the Town of Bracebridge Official Plan; and
- Assessment of problem areas at the 2011 planning horizon including the need for additional east-west and north-south capacity.

Improvements considered generally included new roadway links, major intersection improvements and roadway widenings. With the new links or roadway widenings, it is assumed that intersections along any new facilities will be widened and control improvements (signals) effected where required. Operational improvements at intersections have not been assessed at the 2011 planning horizon. Modelling, as undertaken for this study, did not permit projection of intersection turning movement volumes. Major improvement alternatives included techniques to improve east-west and north-south capacity and can be summarized as follows:

Table 14

**Town of Bracebridge Transportation Study  
Roadway Link Capacity Analysis  
(Future Conditions With Proposed Improvements)**

| Location of Roadway Links         | Number of Lanes | Lane Capacity Assumed (Veh/hr) | Link Capacity (Veh/Day) | 2011 Summer Average Daily Traffic (Veh/Day) | 2011 Vol/Capacity (V/C) |
|-----------------------------------|-----------------|--------------------------------|-------------------------|---------------------------------------------|-------------------------|
| <b>1. District Road 4</b>         |                 |                                |                         |                                             |                         |
| Winhara Road - District Road 17   | 2               | 500                            | 12,579                  | 5,783                                       | 0.46                    |
| Ecclestone Drive - Gordon Street  | 2               | 700                            | 15,251                  | 6,621                                       | 0.43                    |
| Ontario Street - Armstrong Street | 2               | 700                            | 17,157                  | 14,279                                      | 0.83                    |
| Westvale Drive - McCrank Drive    | 2               | 600                            | 11,437                  | 11,128                                      | 0.97                    |
| <b>2. District Road 14</b>        |                 |                                |                         |                                             |                         |
| Highway 11 - Johnston Heights     | 2               | 500                            | 8,426                   | 5,200                                       | 0.62                    |
| <b>3. District Road 16</b>        |                 |                                |                         |                                             |                         |
| Young Street - Ontario Street     | 2               | 500                            | 11,231                  | 5,971                                       | 0.53                    |
| <b>4. District Road 37</b>        |                 |                                |                         |                                             |                         |
| Hwy 11 - Muskoka Pines Road       | 2               | 600                            | 11,905                  | 11,723                                      | 0.98                    |
| Queen Street - Ontario Street     | 2               | 600                            | 11,020                  | 13,897                                      | 1.26                    |
| <b>6. District Road 42</b>        |                 |                                |                         |                                             |                         |
| Highway 11 - Bracebridge Road     | 2               | 700                            | 14,141                  | 12,257                                      | 0.87                    |
| Front Street - Main Street        | 2               | 500                            | 11,366                  | 12,231                                      | 1.08                    |
| <b>7. Highway 118</b>             |                 |                                |                         |                                             |                         |
| West Study Limit - Balls Drive    | 2               | 700                            | 14,141                  | 11,401                                      | 0.81                    |
| <b>8. Manitoba Street</b>         |                 |                                |                         |                                             |                         |
| Ida Street - Ann Street           | 2               | 500                            | 10,893                  | 15,011                                      | 1.38                    |

Link Capacity = (P.M. Peak Hour Approach Capacity + P.M. Peak Hour Directional Split) + P.M. Peak Hour Factor

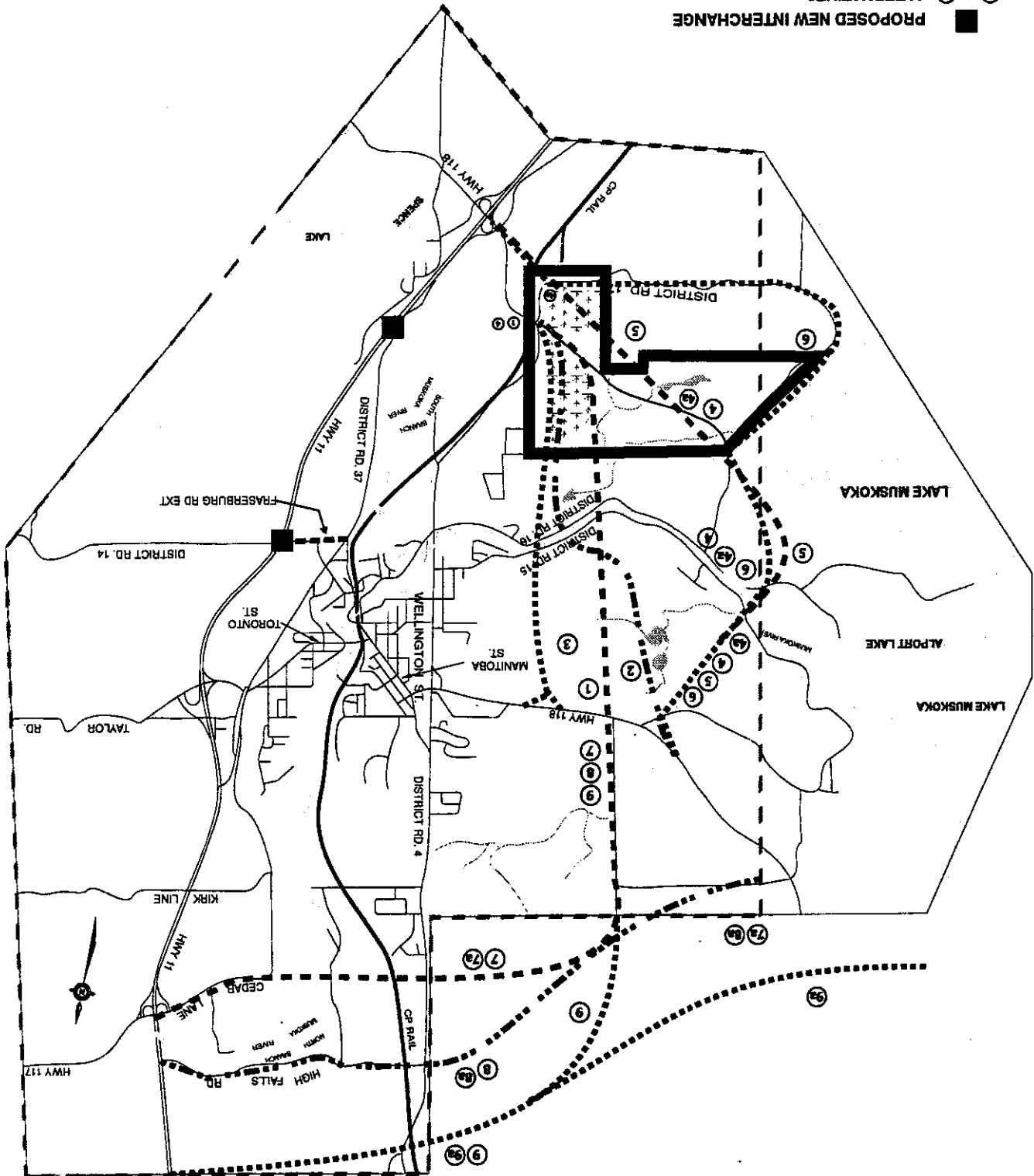
# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

SYSTEM IMPROVEMENT  
ALTERNATIVES

EXHIBIT No. 15

NOT TO SCALE

- PROPOSED NEW INTERCHANGE
- ① to ⑨ ALTERNATIVES
- ▬ ROYAL MUSKOKA PROPERTY
- ▬ WETLAND AREAS WITHIN ROYAL MUSKOKA
- ▬ STUDY AREA



- Upgrading of Wellington Street (District Road 4) from a two or three lane to a four or five lane facility from Highway 11 to Monck Road;
- Provision of an alternate north-south arterial route west of Wellington Street;
- Provision of an alternate east-west arterial route north of the urban area;
- Provision of an interchange on Highway 11 at District Road 37 and/or provision of an interchange on Highway 11 at District Road 14; and
- The upgrading of Thomas Street from a two to a three or four lane cross-section.

### **7.3 NETWORK ALTERNATIVES**

In order to resolve problems at the 2011 planning horizon, several network alternatives in addition to the "do nothing" scenario were evaluated through an assessment of assigned link and screening volumes and capacities. Each network alternative involved various combinations of the individual improvements described in Section 7.2. Prior to establishing network alternatives, individual improvement alternatives were reviewed to determine their feasibility. Future networks also included the short term operational improvements described in Section 6.0 of the report.

#### **7.3.1 Evaluation of Network Alternatives**

Given the areas of projected growth within the Town of Bracebridge, many of the network alternatives are similar. The major difference in network scenarios relates to the method of providing additional north-south and east-west capacity. In addition, network scenarios were also examined which considered the impact of different interchange locations on Highway 11. In terms of satisfying overall traffic demand, the improvements presented in Exhibit 16 provides the best overall traffic service for the community. With these improvements, all capacity problems are generally resolved within the Town at the 2011 planning horizon. The improvements can all be solidly justified based upon both link and network capacity considerations.

As can be noted from Exhibit 16, the recommended network for 2011 includes the following major elements:

- A new two lane arterial link located to the west of Wellington Street connecting the intersection of Highway 11 and Highway 118 east to Highway 118 west;
- A new two lane arterial link located north of the existing urban area and connecting Highway 11 to Highway 118 west;
- A new interchange on Highway 11 at District Road 37; and
- Realignment of Fraserburg Road (District Road 14) west of Highway 11;

### 7.3.2 North and West Alternative Arterial Routes

The preferred 2011 network includes two lane links representing alternative west and north arterial links outside the existing urban area of the Town of Bracebridge. As a transportation model does not recognize engineering, environmental and economic factors associated with the provision of new roadway links, it was considered appropriate to undertake more detailed assessment and evaluation of the feasibility of these proposed links and to identify preliminary routes. *It is fundamental to note that the scope of this study did not include the completion of detailed environmental impact assessments for any of the potential network improvements.* As a consequence, routes identified as a result of this study should be considered as *conceptual* in nature. Environmental Assessments or Route Planning Studies will be required for both the north and the west arterial routes.

Exhibit 16 shows the conceptual alternative routes for both the west and north arterials as developed for the Town of Bracebridge Transportation Study. The routes selected for evaluation were done so in consultation with Steering Committee members and staff of the Ministry of Natural Resources. The following basic design criteria for these roadways was assumed for the purposes of the Study:

- Design Speed - 100 km/hr;
- Right-of-Way - 36 m - 55 m;
- Maximum Grade - 6%;
- Horizontal Curve - Min. 420 m; and
- Provision for possible four lane divided limited access facility.

The "do nothing" option was considered in conjunction with both the north and west arterial route options. The widening of Wellington Street (District 4) was also considered as one of the alternatives to a new west arterial roadway. Westerly arterial roadway options approaching the Muskoka River from the south, east of District Road 4 were not considered due to physical and environmental constraints. The existing sewage lagoons on the west side of District Road 4, south of the Muskoka River also preclude consideration of alternatives in this area.

### 7.3.3 Assessment/Evaluation Criteria

In order to undertake an assessment of the alternatives, a number of criteria "groups" and associated subfactors were developed. Each of the criteria groups and subfactors are described below.

## Criteria Group 1 - Traffic Service

Within the traffic service criteria group, five subfactors have been identified. These subfactors are described below:

- *Provision of High Quality Service or High Quality Capacity* - This refers to the ability of the proposed improvements or links to offer reasonable levels of capacity, i.e. links will operate with a volume to capacity ratio of less than 0.9 to the planning horizon 2011 and beyond;
- *Emergency Services* - Involves the ability of each alternative to accommodate emergency service vehicles giving due consideration to potential levels of capacity and congestion;
- *Safety* - Refers to the ability of each alternative to resolve existing or potential safety hazards;
- *Removal of Auto and Truck Traffic from Internal Roadways* - Refers to the ability of the proposed alternative to divert through traffic and auto volumes away from internal Town roadways; and
- *Network Flexibility* - Refers to the ability of the local roadway network to accommodate traffic diversion as a result of unexpected incidents and to provide connections to other existing or proposed roadway links.

## Criteria Group 2 - Economic Environment

There are two subfactors which are included as part of this criteria group:

- *Development Potential* - Refers to the impact of the alternative has on development potential and employment levels in the area whether negative or positive;
- *Accessibility* - Refers to the impact that each alternative has on access to existing and future developments within the Town of Bracebridge, i.e. potential business disruptions.

#### Criteria Group 3 - Social Environment

Within Criteria Group 3, five subfactors were employed:

- *Noise* - Refers to the impact that each alternative may have on noise levels within the Town or on properties adjacent to proposed improvements;
- *Intrusion and Downstream Traffic Impacts* - Refers to the impact that each alternative may have on the potential for intrusion of non-local traffic into residential areas as a result of anticipated congestion on main roadway links in the Town of Bracebridge;
- *Aesthetics* - Refers to the aesthetic impact that an alternative may have within the community including a new crossing of the Muskoka River;
- *Impact on Existing Residential Properties* - Refers in general terms to any property acquisition or physical impact that may be associated within any roadway right-of-way acquisition or construction; and
- *Impact on Commercial Properties* - Refers in general terms to any property acquisition that may be required for roadway right-of-way acquisition or construction.

#### Criteria Group 4 - Culture Environment

There are two subfactors contained within the culture environment group:

- *Archaeological Resources* - Refers to the impact that each alternative may have on registered archaeological sites; and
- *Heritage Resources* - Refers to the impact that each alternative may have on registered heritage sites.

TABLE 15  
TOWN OF BRACEBRIDGE TRANSPORTATION STUDY  
COST ESTIMATION FOR PLANNING ALTERNATIVES  
(COST IN 1992 \$)

| ITEMS                                                                        | WEST ARTERIAL ROUTE ALTERNATIVES |              |              |              |              |              |              |                            |
|------------------------------------------------------------------------------|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------|
|                                                                              | ALT 1                            | ALT 2        | ALT 3        | ALT 4        | ALT 4(a)     | ALT 5        | ALT 6        | Wilmington Street Widening |
| 1. FROM EXISTING HWY 118 HWY 11 INTERCHANGE TO ROYAL MUSKOKA PROPERTY        |                                  |              |              |              |              |              |              |                            |
| A. WIDENING HWY 118 FROM THE INTERCHANGE TO RAILWAY UNDERPASS                |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | 1.1                              | 1.1          | 1.1          | 1.1          |              |              |              | 1.1                        |
| - COST                                                                       | \$836,000                        | \$836,000    | \$836,000    | \$836,000    |              |              |              | \$836,000                  |
| B. CONSTRUCT A NEW RAILWAY OVERPASS (4 LANES)                                |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION                                              | \$1,600,000                      | \$1,600,000  | \$1,600,000  | \$1,600,000  |              |              |              | \$1,600,000                |
| C. CONSTRUCT A 2 LANE RURAL ARTERIAL ROADWAY SECTION                         |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | N/A                              | N/A          | N/A          | N/A          |              |              |              | N/A                        |
| - COST                                                                       |                                  |              |              |              | \$800,000    | 1            | 0.5          | 0.5                        |
| 2. FROM W. BOUNDARY OF ROYAL MUSKOKA PROPERTY TO N/SIDE OF MUSKOKA RIVER     |                                  |              |              |              |              |              |              |                            |
| A. WIDENING DISTRICT RD. 4 FROM RAILWAY UNDERPASS TO N/SIDE OF MUSKOKA RIVER |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | N/A                              | N/A          | N/A          | N/A          |              |              |              | 3                          |
| - COST                                                                       |                                  |              |              |              |              |              |              | \$2,280,000                |
| B. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | 2.4                              | 2.5          | 2.7          | 4.4          | 4.4          | 4.2          | 5.7          |                            |
| - COST                                                                       | \$1,440,000                      | \$1,500,000  | \$1,620,000  | \$2,640,000  | \$2,640,000  | \$2,520,000  | \$3,420,000  |                            |
| C. CONSTRUCT A NEW RIVER CROSSING BRIDGE (4 LANES)                           | \$8,400,000                      | \$8,400,000  | \$7,600,000  | \$7,000,000  | \$7,000,000  | \$7,000,000  | \$7,000,000  | \$3,500,000                |
| 3. FROM N.SIDE OF MUSKOKA RIVER TO HWY 118 W                                 |                                  |              |              |              |              |              |              |                            |
| A. WIDEN DISTRICT RD. 4 FROM N.SIDE OF MUSKOKA RIVER TO HWY 118 W.           |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | N/A                              | N/A          | N/A          | N/A          |              |              |              | 1.7                        |
| - COST                                                                       |                                  |              |              |              |              |              |              | \$1,280,000                |
| B. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           | 2.45                             | 2.8          | 1.9          | 2            | 2            | 2            | 2            |                            |
| - COST                                                                       | \$1,470,000                      | \$1,680,000  | \$1,140,000  | \$1,200,000  | \$1,200,000  | \$1,200,000  | \$1,200,000  |                            |
| 4. FROM HWY 118 W TO HWY 117 INTERCHANGE                                     |                                  |              |              |              |              |              |              |                            |
| A. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                  |              |              |              |              |              |              |                            |
| - LENGTH OF THE ROADWAY SECTION(M)                                           |                                  |              |              |              |              |              |              |                            |
| - COST                                                                       |                                  |              |              |              |              |              |              |                            |
| B. CONSTRUCT A NEW RAILWAY OVERPASS (4 LANES)                                |                                  |              |              |              |              |              |              |                            |
| - COST                                                                       |                                  |              |              |              |              |              |              |                            |
| C. CONSTRUCT A NEW RIVER CROSSING BRIDGE (4 LANES)                           |                                  |              |              |              |              |              |              |                            |
| 5. TOTAL ESTIMATE                                                            |                                  |              |              |              |              |              |              |                            |
| ENGINEERING (15%)                                                            | \$13,746,000                     | \$12,016,000 | \$12,796,000 | \$13,276,000 | \$13,440,000 | \$13,020,000 | \$13,920,000 | \$9,508,000                |
| CONTEINGENCY (15%)                                                           | \$2,061,900                      | \$1,802,400  | \$1,919,400  | \$1,991,400  | \$2,016,000  | \$1,953,000  | \$2,088,000  | \$1,426,200                |
| SUNDRY (5%)                                                                  | \$1,374,600                      | \$1,201,600  | \$1,279,600  | \$1,327,600  | \$1,344,000  | \$1,302,000  | \$1,392,000  | \$950,800                  |
| SUBTOTAL                                                                     | \$697,300                        | \$600,800    | \$639,800    | \$663,800    | \$672,000    | \$651,000    | \$696,000    | \$473,400                  |
| G.S.T. (7%)                                                                  | \$17,869,800                     | \$15,820,800 | \$16,634,800 | \$17,258,800 | \$17,472,000 | \$16,926,000 | \$18,036,000 | \$12,360,400               |
| TOTAL                                                                        | \$19,567,100                     | \$17,621,600 | \$18,374,600 | \$19,262,600 | \$18,995,040 | \$18,110,820 | \$19,362,720 | \$13,225,628               |

NOTE: 1. COST ESTIMATES DO NOT INCLUDE PROPERTY ACQUISITIONS.  
2. SHOULD FUTURE EXPANSION FROM 2 LANE TO 4 LANE BE REQUIRED  
AN ADDITIONAL COST OF \$ 780,000/KM IS ANTICIPATED.

N/A - NOT APPLICABLE

TABLE 15 Cont'd

**BRACEBRIDGE TRANSPORTATION STUDY**  
**COST ESTIMATION FOR PLANNING ALTERNATIVES**  
 (COST IN 1982 \$)

| ITEMS                                                                        | NORTH ARTERIAL ROUTE ALTERNATIVES |        |       |        |       |        |
|------------------------------------------------------------------------------|-----------------------------------|--------|-------|--------|-------|--------|
|                                                                              | ALT 7                             | ALT 7A | ALT 8 | ALT 8A | ALT 9 | ALT 9A |
| 1. FROM EXISTING HWY 118/HWY 11 INTERCHANGE TO ROYAL MUSKOKA PROPERTY        |                                   |        |       |        |       |        |
| A. WIDENING HWY 118 FROM THE INTERCHANGE TO RAILWAY UNDERPASS                |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| B. CONSTRUCT A NEW RAILWAY OVERPASS (4 LANES)                                |                                   |        |       |        |       |        |
| C. CONSTRUCT A 2 LANE RURAL ARTERIAL ROADWAY SECTION                         |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| 2. FROM W. BOUNDARY OF ROYAL MUSKOKA PROPERTY TO N/SIDE OF MUSKOKA RIVER     |                                   |        |       |        |       |        |
| A. WIDENING DISTRICT RD. 4 FROM RAILWAY UNDERPASS TO N/SIDE OF MUSKOKA RIVER |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| B. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| C. CONSTRUCT A NEW RIVER CROSSING BRIDGE (4 LANES)                           |                                   |        |       |        |       |        |
| 3. FROM N/SIDE OF MUSKOKA RIVER TO HWY 118 W                                 |                                   |        |       |        |       |        |
| A. WIDEN DISTRICT RD. 4 FROM N/SIDE OF MUSKOKA RIVER TO HWY 118 W            |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| B. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| 4. FROM HWY 118 W TO HWY 117 INTERCHANGE                                     |                                   |        |       |        |       |        |
| A. CONSTRUCT A 2 LANE RURAL ARTERIAL ROAD SECTION                            |                                   |        |       |        |       |        |
| - LENGTH OF THE ROADWAY SECTION(KM)                                          |                                   |        |       |        |       |        |
| - COST                                                                       |                                   |        |       |        |       |        |
| B. CONSTRUCT A NEW RAILWAY OVERPASS (4 LANES)                                |                                   |        |       |        |       |        |
| C. CONSTRUCT A NEW RIVER CROSSING BRIDGE (4 LANES)                           |                                   |        |       |        |       |        |
| TOTAL ESTIMATE                                                               |                                   |        |       |        |       |        |
| ENGINEERING (15%)                                                            |                                   |        |       |        |       |        |
| CONTINGENCY (10%)                                                            |                                   |        |       |        |       |        |
| SUNDRY (5%)                                                                  |                                   |        |       |        |       |        |
| SUBTOTAL                                                                     |                                   |        |       |        |       |        |
| G.S.T. (7%)                                                                  |                                   |        |       |        |       |        |
| TOTAL                                                                        |                                   |        |       |        |       |        |

N/A - NOT APPLICABLE

NOTE: 1. COST ESTIMATES DO NOT INCLUDE PROPERTY ACQUISITIONS;  
 2. SHOULD FUTURE EXPANSION FROM 2 LANE TO 4 LANE BE REQUIRED  
 AN ADDITIONAL COST OF \$ 760,000/KM IS ANTICIPATED.

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## 7.4 SUMMARY OF ASSESSMENT OF POTENTIAL NETWORK IMPROVEMENTS

### 7.4.1 Alternative West Arterial Route

In considering the information contained in Table 16, the following summary is provided with respect to each alternative (Alternatives 1 to 6):

**Alternative 1** - This particular alternative does not satisfy traffic engineering,

social environmental and engineering criteria. In particular, this route would not permit practical future connections to District Roads 15 and 16 in the area of the Muskoka River. In addition, there would be a significant impact on the proposed activities within the Royal Muskoka Development (see Exhibit 13). There may also be some geometric design concerns with respect to possible connection of Alternative 1 to Highway 118 west of the urban area.

**Alternative 2** - This alternative does not satisfy traffic service, social

environmental and natural environmental criteria. As with Alternative 1, this route would not permit practical connections to District Roads 15 and 16. This route also has significant impact on activities within the Royal Muskoka Development. From an environmental perspective, there will be a significant impact on existing wetlands located south of the Muskoka River and also impacts on existing vegetation and wildlife habitat.

**Alternative 3** - This alternative does not satisfy traffic service, social

environmental, natural environmental, and engineering criteria. Again, as with Alternatives 1 and 2, this alternative does not allow for connections between the proposed route and District Roads 15 and 16. This alternative also has a significant impact on residential properties located along District Roads 15 and 16

TOWN OF BRACEBRIDGE TRANSPORTATION STUDY  
EVALUATION OF PLANNING ALTERNATIVES

FACILITY: WEST ARTERIAL ROUTE

Table 16

| CRITERIA AND SUB-FACTORS |                                                     | EVALUATION |      |      |      |      |      |      |      |      |      | ALTERNATIVE IMPROVEMENT |      |      |      |      |      |            |      |                     |      |
|--------------------------|-----------------------------------------------------|------------|------|------|------|------|------|------|------|------|------|-------------------------|------|------|------|------|------|------------|------|---------------------|------|
|                          |                                                     | MEASURE    |      | 1    |      | 2    |      | 3    |      | 4    |      | 4(a)                    |      | 5    |      | 6    |      | Wellington |      | Do Wellington North |      |
| TRAFFIC SERVICE          | Provision of High Quality Capacity                  | Quality    | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Poor       | Poor | Poor                | Poor |
|                          | Emergency Service                                   | Quality    | Fair | Fair | Fair | Fair | Fair | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Fair       | Poor | Poor                | Poor |
|                          | Safety                                              | Quality    | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Poor       | Poor | Poor                | Poor |
|                          | Removal of Truck Traffic from Internal Roadways     | Quality    | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Poor       | Poor | Poor                | Poor |
|                          | Network Flexibility                                 | Quality    | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor                    | Poor | Poor | Poor | Poor | Poor | Poor       | Poor | Poor                | Poor |
| ECONOMIC ENVIRONMENT     |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Development Potential    |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Accessibility            |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| SOCIAL ENVIRONMENT       |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Noise                    | Intrusion and Downstream Traffic Impacts            | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Aesthetics                                          | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Impact on Existing or Future Residential Properties | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Impact on Commercial Properties, Existing or Future | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Heritage Resources                                  | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| CULTURAL ENVIRONMENT     |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Archaeological Resources |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Heritage Resources       |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| NATURAL ENVIRONMENT      |                                                     | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| Impact on Lakefront      | Vegetation/Wildlife Habitat                         | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Watercourses                                        | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Air Quality                                         | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Wetlands                                            | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
|                          | Impact on Lakefront                                 | Effect     | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good                    | Good | Good | Good | Good | Good | Good       | Good | Good                | Good |
| ENGINEERING              |                                                     | Quality    | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |
| Geometrics               | Cost                                                | Quantity   | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |
|                          | Construction Complexity                             | Quality    | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |
|                          | Staging                                             | Quality    | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |
|                          | Summary                                             | Quantity   | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |
|                          | Summary                                             | Quality    | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair | Fair                    | Fair | Fair | Fair | Fair | Fair | Fair       | Fair | Fair                | Fair |

N/A Not Assessed  
 IMPACTS  
 MAJOR  
 MODERATE  
 NO IMPACT OR MINOR

adjacent to the Muskoka River. In the area of the future crossing of the Muskoka River, Alternative 3 would utilize an existing utility right-of-way; however, given the proximity of the proposed road to the existing utilities, it is anticipated that construction complexity would be high if the utility (gas) company would even permit the roadway to be located at this location. Preliminary discussions with the utility company appear to indicate that they would oppose an arterial roadway in this area. In terms of natural impacts, this facility will have an impact on existing wetlands in areas located to the south of the Muskoka River and also on existing vegetation and wildlife habitat. This alternative also has an impact on the proposed Royal Muskoka Development.

**Alternative 4** - This alternative does not satisfy social and natural environmental criteria. In particular, Alternative 4 will have an impact on the Royal Muskoka Development as currently proposed. In addition, it will have an impact on a recognized wetland area located to the west of District Road No. 4 and north of District Road No. 17.

**Alternative 4A** - This alternative does not satisfy social environmental criteria. In particular, the alternative would have an impact on the Royal Muskoka property as proposed.

**Alternative 5** - Alternative 5 does not satisfy social and natural environmental criteria. This alternative has an impact on the Royal Muskoka property as proposed and on existing recognized wetland areas west of District Road No. 4 and north of District Road No. 17.

**Alternative 6 - Alternative 6 does not satisfy social environmental and natural proximity environmental criteria. In particular, this facility has significant physical and proximity impacts on the Muskoka Bay lakefront in the area of Stevens Bay. From a capital cost perspective, Alternative 6 is marginally the most expensive route. This is also the longest and most circuitous route south of the river and could be perceived as involving out-of-the-way travel, even for through traffic. This facility does not significantly impact the proposed Royal Muskoka Development.**

**Widening of Wellington Street (District Road 4) from Highway 11 to Highway 118 (Monck Road) - This alternative does not satisfy traffic service, economic, social environmental, natural environmental and engineering criteria. Specifically, this facility would not provide long term (beyond 2011) north-south capacity in the area even with widening of Wellington Street to a four or five lane facility. Given long term network capacity constraints associated with this improvement, there would be an impact on the overall development potential within the Study Area. Upgrading of this facility would still result in through traffic travelling through the built-up area of the community. As a consequence, there would be an impact on safety along Wellington Street. Widening of this roadway from two or three to four lanes would require significant property acquisition which may include residential, commercial and institutional properties. Widening of Wellington Street would be difficult to stage and would result in major disruption to traffic service within the community. Although provision of additional capacity afforded by widening Wellington Street to four or five lanes would provide sufficient north-south capacity to beyond the 2011 planning horizon, there would be a need beyond 2011 to provide additional north-south capacity within the community.**

**Do Nothing** - This alternative does not satisfy traffic service, economic, social, and engineering criteria. This alternative provides for no improvement in link or network capacity which would ultimately compromise the overall ability of the community to accommodate additional development; both within the Study Area and in the adjacent communities. In addition, the traffic congestion which would result from a "do nothing" approach may result in serious safety and social impacts on the local roadways.

**Recommendations - Alternative West Arterial Route** - Based on the analysis summarized above, it has been concluded that *Alternatives 4A and 6* could both satisfy future north-south capacity requirements in the community. Both alternatives would result in social and natural environmental impacts, specifically within the area of the proposed Royal Muskoka Development. Both alternatives will permit significant expansion of the community to occur between the route and the existing westerly boundary of the built-up area.

Alternative 4A is considered slightly superior to Alternative 6 in terms of providing a more direct route between Highway 11 and Highway 118 and also is characterized by better roadway geometrics. A fundamental concern relative to Alternative 6 is the significant impact that this facility may have on the Muskoka Lake lakefront area in Stevens Bay. Both physical (property) and proximity impacts could be anticipated. Based upon the preliminary assessment undertaken as part of this strategic study, it is recommended that *Alternative 4A* be selected as the preferred alternative for an arterial roadway west of the community. It must, however, be recognized that an Environmental Assessment or a Route Planning Study will be required to definitively identify a new route. All possible alignments will have to be examined again as part of a complete Environmental Assessment or Route Planning Study.

The modelling indicates that by 2011, this west arterial could carry in the order of 5,200 vehicles per day (SADT). The location of the proposed west arterial and the future connection with Highway 118 west, does not preclude through traffic from travelling "back" into the urban area to conduct personal business or shop.

#### 7.4.2 Alternative North Arterial Route

In considering the information contained in Table 17, the following summary is provided with respect to each of the potential northern arterial routes (Alternatives 7 to 9A):

**Alternative 7** - This alternative does not satisfy traffic service, social environmental and engineering criteria. Although this scenario utilizes the existing interchange at Highways 117 and 11, the proposed route results in both physical and proximity impacts on the existing residential and recreational areas both east and west of the Muskoka River. In addition, this route requires a crossing of the Muskoka River which, given existing topography, will be difficult from an engineering perspective. There is also a significant capital cost associated with the structure and the overall route.

**Alternative 7A** - This alternative is similar to Alternative 7 except that instead of following South Monck Drive to connect to Highway No. 118 West, the route follows the existing local road between Concessions 4 and 5 to a more westerly intersection with Highway 118. Based on the traffic analysis conducted as part of this Study, it appears that traffic patterns do not appear to justify such a connection.

TOWN OF BRACEBRIDGE TRANSPORTATION STUDY  
EVALUATION OF PLANNING ALTERNATIVES

FACILITY: NORTH ARTERIAL ROUTE

Table 17

| CRITERIA AND SUB-FACTORS    |                                                 | EVALUATION MEASURE | 7    | 7A   | 8    | 8A   | 9    | 9A   | DO NOTHING |
|-----------------------------|-------------------------------------------------|--------------------|------|------|------|------|------|------|------------|
| TRAFFIC SERVICE             | Provision of High Quality Capacity              | Quality            | Fair | Fair | Fair | Fair | Good | Good | Poor       |
|                             | Emergency Service                               | Quality            | Good | Good | Good | Good | Good | Good | Poor       |
|                             | Safety                                          | Quality            | Good | Good | Good | Good | Good | Good | Poor       |
|                             | Removal of Truck Traffic from Internal Roadways | Quality            | Good | Good | Good | Good | Good | Good | Poor       |
| ECONOMIC ENVIRONMENT        | Development Potential                           | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ●          |
|                             | Accessibility                                   | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | N/A        |
| SOCIAL ENVIRONMENT          | Noise                                           | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Intrusion and Downstream Traffic Impacts        | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Aesthetics                                      | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Property                                        | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Impact on Existing or Residential Properties    | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Impact on Commercial Properties                 | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
| CULTURAL ENVIRONMENT        |                                                 | Effect             | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A        |
| Archaeological Resources    |                                                 | Effect             | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A        |
| Heritage Resources          |                                                 | Effect             | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A        |
| NATURAL ENVIRONMENT         |                                                 | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
| Vegetation/Wildlife Habitat | Effect                                          | ○                  | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Watercourses                                    | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Air Quality                                     | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
|                             | Soil Quality                                    | Effect             | ○    | ○    | ○    | ○    | ○    | ○    | ○          |
| ENGINEERING                 |                                                 | Quality            | Good | Fair | Poor | Poor | Fair | Fair | N/A        |
| See Table 15                | Geometrics                                      | Quality            | Good | Fair | Poor | Poor | Fair | Fair | N/A        |
|                             | Cost                                            | Quality            | Good | Fair | Poor | Poor | Fair | Fair | N/A        |
|                             | Construction Complexity                         | Quality            | Fair | Fair | Poor | Poor | Fair | Good | N/A        |
|                             | Staging                                         | Quality            | Fair | Fair | Poor | Poor | Fair | Good | N/A        |
| SUMMARY                     |                                                 |                    | Fair | Fair | Poor | Poor | Good | Fair | Poor       |

NO IMPACT OR MINOR  
 MODERATE  
 MAJOR  
 IMPACTS  
 N/A Not Assessed

**Alternative 8** - This alternative does not satisfy traffic service and engineering criteria. This route utilizes the existing High Falls Road, north of Muskoka River, running westerly across District Road 4, then south-westerly to South Monck Drive and southerly to Highway 118 West. The existing intersection with Highway 11 is at-grade. It appears from a review of this location that there may not be sufficient room at the intersection to construct a grade separated interchange. In addition, the terrain along this route is rough and extremely close to the Muskoka River; as a result, there may be some serious physical and environmental impacts in the area of the river. With the alignment as proposed, there will be no requirement for a river crossing.

**Alternative 8A** - This alternative is similar to Alternative 8 except it follows the existing local road between Concession 4 and 5, as described in Alternative 7A above. Again, and as with Alternative 7A, traffic patterns and demand does not justify extension of the north arterial beyond South Monck Drive.

**Alternative 9** - This alternative does not satisfy natural environmental criteria. This route may run through an area designated by MNR as a "deer yard". It is fundamental to recognize that there is no river crossing required as part of this route. The intersection of the proposed route with Highway 11 provides an ideal location to construct a grade separated interchange. *It is proposed that this alternative would connect to the interchange proposed by MTO as part of the Highway 11 Planning Study.* Service roads on each side of the highway could provide a connection to High Falls Road on the west side of Highway 11 and to an existing residential access road on the east. The existing District and local roads and the CN Railway are located such that roadway crossing could be readily accommodated. The route generally runs through an undeveloped wooded area. There are some agricultural lands in the area east and west of the Ziska Road.

**Alternative 9A** - Again Alternative 9A involves an extension of the north arterial from the extension of South Monck Drive to connect to Highway 118 further to the west. Again, traffic patterns and forecasted demand do not warrant such an extension.

**Recommendations - Alternative North Arterial** - Based on the assessment summarized above, it has been concluded that Alternative 9, from a conceptual basis, represents the best alternative for an arterial roadway north of the Town of Bracebridge. As previously discussed, this roadway is likely not warranted until at or beyond the 2011 horizon. As with the western arterial route, an Environmental Assessment or Route Planning Study will be required which will address all environmental aspects of the proposal including potential impacts on the "deer yard".

#### 7.4.3 Highway 11 Interchange Alternatives

Table 18 provides a summary of the assessment of the two interchange alternatives on Highway 11 considered within the context of this Study. These interchange alternatives were also reviewed as part of the MTO Highway 11 Planning Study. Similar criteria and subfactors to those used to evaluate the proposed west and north alternative arterial routes were employed in the review of Highway 11 interchange options.

**Alternative 1 - Interchange at District Road 37** - This alternative does not satisfy economic criteria. This interchange also does not "enhance" the development potential of lands to the east of Bracebridge or lands to the west of Bracebridge in the area of District Road 14.

## TOWN OF BRACEBRIDGE TRANSPORTATION STUDY

## ALTERNATIVE IMPROVEMENT

☐ NO IMPACT OR  
☒ MODERATE  
☐ MAJOR

**Alternative 2 - Interchange at District Road 14 (Fraserburg Road) - This alternative**

does not satisfy social environmental and engineering criteria. Although this

alternative will best serve potential new development east of Highway 11,

Fraserburg Road, to the west of Highway 11, travels through an existing

residential area. In order for an interchange to be located here, Fraserburg Road

would have to be realigned to provide a more direct connection to District Road

37. In its present form and location, Fraserburg Road could not be upgraded to

handle additional traffic volumes that may result from construction of an

interchange. In addition, there are a number of engineering constraints related to

the provision of an interchange and interchange ramps in the area of District Road

14. The work, conducted by MTO as part of the Highway 11 Planning Study,

indicated that there are soils problems in the area which would have an impact on

construction complexity and project cost. In addition, it also appears that there

may be high waterables in the area which again, could significantly affect project

cost. Because of property and physical constraints, the interchange ramps,

overpass and approach roadways would likely be constructed with substandard

geometry.

**Recommendations - Highway 11 Interchange - From a traffic service perspective,**

there is little difference between the alternatives. Use of the EMMIE II Model to

determine travel distance implications for motorists revealed that there is no

significant difference between each alternative. Both interchange alternatives also

provide similar access conditions to the existing urban area. As a result of the

above, and given the engineering and environmental constraints, it can be

confirmed that an interchange on Highway 11 should be located at District Road

37.

Arising from the review of interchange alternatives, it is recommended that Fraserburg Road between Highway 11 and District Road 37 be realigned and reconstructed as shown conceptually in Exhibit 16. It is considered that such a realignment and reconstruction should be undertaken no matter where an interchange is located along Highway 11. Responsibility for upgrading Fraserburg Road should be shared by the District Municipality of Muskoka and MTO. This arrangement recognizes the increased volumes carried by this roadway since the construction of the overpass at Highway 11 in 1985, including the amount of highway destined traffic using this roadway. Based upon the origin-destination information assembled for this Study, it has been estimated that 25%-30% of the traffic on Fraserburg Road has originated from or is destined for Highway 11. Traffic from east of Highway 11 must now cross Highway 11 to use District Road 37 to access Highway 11 to the north or south. It could be argued that realignment of this roadway should have been undertaken in 1985 in conjunction with the construction of the existing overpass structure. Preliminary and detail designs should be initiated by the District and MTO.

## 7.5 DESCRIPTION OF RECOMMENDED NETWORK - 2011 PLANNING HORIZON

The recommended network for the 2011 planning horizon consists of the following major improvements (See Exhibit 14):

- Construction of a *west arterial facility* connecting Highway 11 to Highway 118 West, west of the urban area of Bracebridge. This facility would provide additional north-south capacity in the community and remove non-local traffic from town roadways; in particular, Wellington Street and Manitoba Street. This facility, which would initially be constructed as a two-lane limited-access roadway, will become a key component in the overall transportation network for the community. Modelling of various



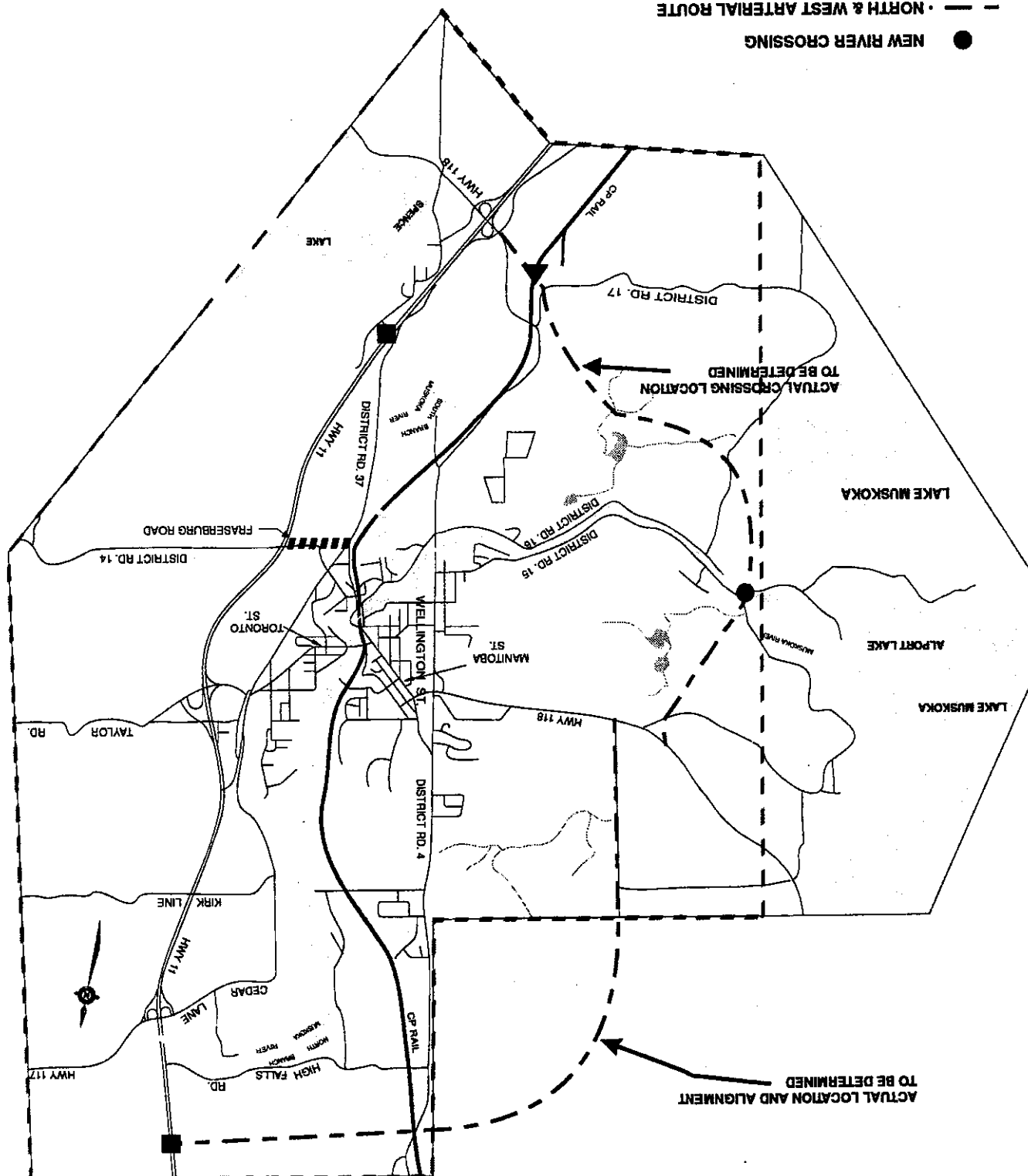
Lottin & Hubold Associates  
ENGINEERS, ARCHITECTS AND PLANNERS

# TOWN OF BRACEBRIDGE TRANSPORTATION PLANNING STUDY

RECOMMENDED ROADWAY  
NETWORK FOR YEAR 2011  
EXHIBIT No. 16

NOT TO SCALE

- NEW RIVER CROSSING
- NORTH & WEST ARTERIAL ROUTE
- PROPOSED NEW INTERCHANGE
- ▲ NEW RAILWAY GRADE SEPARATION
- //// REALIGN FRASERBURG RD. WEST OF HWY 11
- STUDY AREA



- alternatives to this link clearly indicates that this improvement will provide maximum relief to north-south facilities in the Study Area while enhancing future development potential in the western portion of the community. This facility can be staged in both length and cross section. As mentioned, initially only a two lane facility will be required; however, it is anticipated that four lanes will ultimately be needed to accommodate future traffic demands well beyond the 2011 planning horizon;
- Although construction of a *northerly arterial* facility between Highway 11 and Highway 118 West may not be considered necessary by the 2011 planning horizon, conditions on District Road 42 should be monitored on a regular basis. Prior to proceeding with implementation of this roadway, consideration should be given to providing a two-way centre left turn lane on District Road 42. It must, however, be recognized that the capacity constraint on this roadway is the Toronto Street river crossing. There may be little value to widening the river crossing structure as congested conditions will always exist in the downtown.
- By 2011, if the recommendations contained in this report are followed, Wellington Street will be characterized by a *three lane cross section including a two-way centre left turn lane* from north of the Wellington Street Bridge to Monck Road. It may also be practical to consider future implementation of a two-way centre left turn lane from the Wellington Street Bridge South to the new west arterial route. Requirement for this upgrading may result from additional commercial development along this roadway;
- Realignment and extension of Fraserburg Road* from Highway 11 to District Road 37. This improvement should be undertaken in order to improve existing geometric problems on Fraserburg Road west of Highway 11; and
- Construction of an *interchange on Highway 11 at District Road 37*. This interchange should be constructed consistent with the recommendations from Highway 11 Planning Study. The timing for this improvement has not been considered as part of this study and should be determined by MTO;

### 7.5.1 Network Improvements at the 1991 and 2001 Planning Horizons

Given the projected growth in traffic demand from 1991 to 2001, it is not anticipated that major improvements will be required over and above the widening of Wellington Street to provide a two-way centre left turn lane and the upgrading of the Wellington Street/Beaumont Drive intersection.

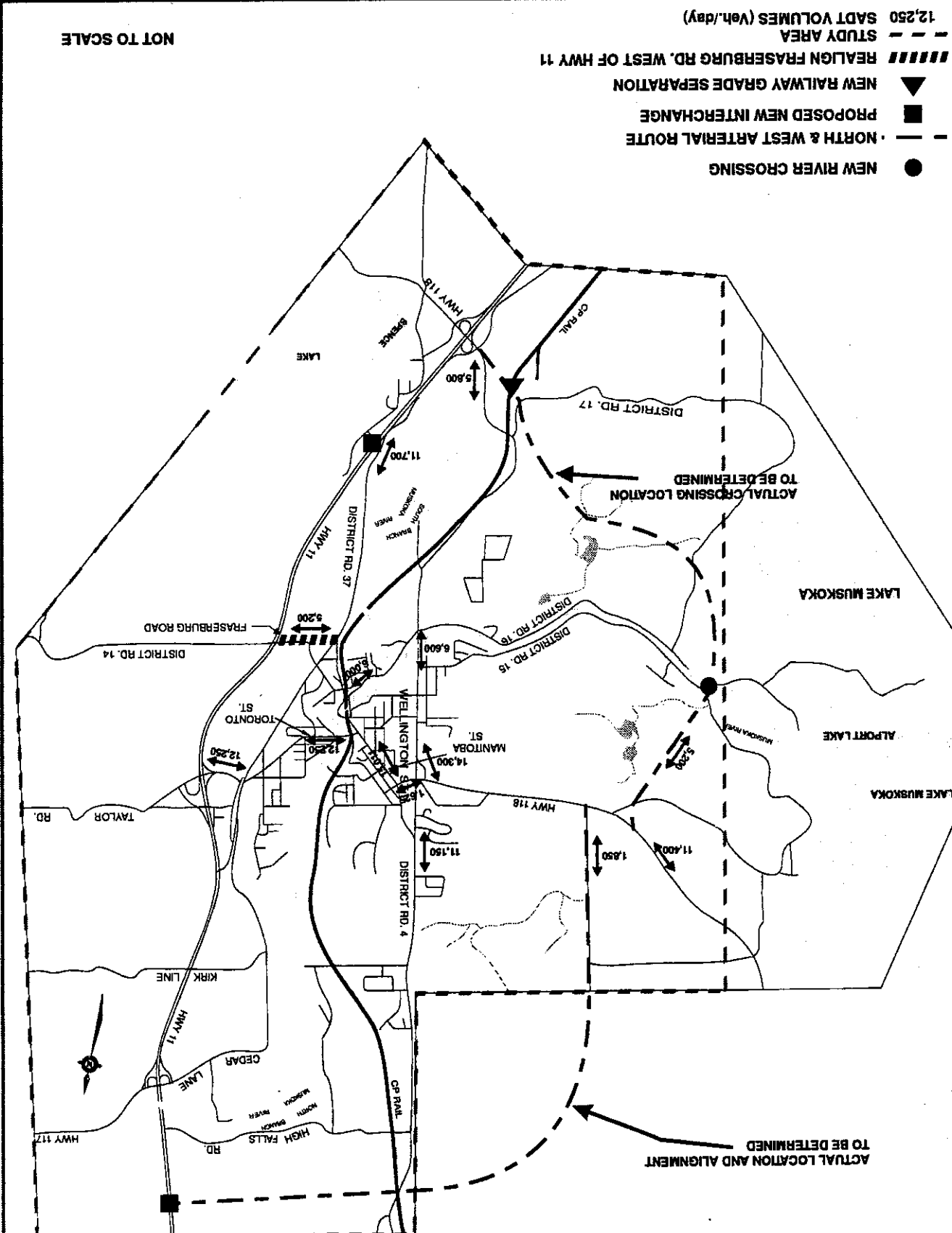
A traffic signal may be warranted at the Ontario Street/Manitoba Street intersection within 8-10 years.

### 7.5.2 Conditions on the 2011 Preferred Network

The improvements proposed for the 2011 planning horizon should generally result in all links within the network operating at a Level of Service considered acceptable by the Town of Bracebridge, the District Municipality of Muskoka and the Ministry of Transportation with the exception of Manitoba Street and Toronto Street between Brid Lane and Main Street. These roadway sections may continue to operate at Level of Service E to F during peak periods. Although there may be minor areas in the network where the volume to capacity ratio may exceed 0.9 for short periods of time, problems in these areas are not considered to warrant remedial action. Exhibit 17 shows estimated daily volumes associated with the 2011 recommended network (SADT). Table 19 provides a summary of operating conditions on key links with the preferred network in place for the 2011 horizon.

**EXHIBIT No. 17**

**FORECASTED SADT ON RECOMMENDED  
ROADWAY NETWORK (2011)**



**Table 19**

**Town of Bracebridge Transportation Study  
Future (2011) Screenline Capacity Analysis  
Recommended Network  
(P.M. Peak Hour)**

| Roadway Link      | Year 2011                |            |            |            |       |  | Link Capacity<br>Assumed<br>(Veh/hr) |
|-------------------|--------------------------|------------|------------|------------|-------|--|--------------------------------------|
|                   | With New Arterial Routes |            |            |            |       |  |                                      |
|                   | Volume (Veh/hr)          |            | V/C        |            |       |  |                                      |
|                   | Northbound               | Southbound | Northbound | Southbound |       |  |                                      |
|                   | Screenline A-A           |            |            |            |       |  |                                      |
| Wellington Street | 287                      | 168        | 0.41       | 0.24       | 700   |  |                                      |
| District Road 16  | 248                      | 139        | 0.50       | 0.28       | 500   |  |                                      |
| District Road 37  | 756                      | 533        | 1.51       | 1.07       | 500   |  |                                      |
| Hwy 11            | 1,163                    | 850        | 0.31       | 0.22       | 3,800 |  |                                      |
| New Crossing      | 253                      | 215        | 0.32       | 0.27       | 800   |  |                                      |
| Total Screenline  | 1,707                    | 1,905      | 0.27       | 0.30       | 6,300 |  |                                      |
| Screenline B-B    |                          |            |            |            |       |  |                                      |
| Wellington Street | 619                      | 273        | 0.88       | 0.39       | 700   |  |                                      |
| Manitoba Street   | 591                      | 688        | 1.18       | 1.38       | 500   |  |                                      |
| New Crossing      | 253                      | 215        | 0.32       | 0.27       | 800   |  |                                      |
| Total Screenline  | 1,463                    | 1,176      | 0.73       | 0.59       | 2,000 |  |                                      |
| Screenline C-C    |                          |            |            |            |       |  |                                      |
| Wellington Street | 238                      | 231        | 0.34       | 0.33       | 700   |  |                                      |
| District Road 37  | 558                      | 332        | 0.93       | 0.55       | 600   |  |                                      |
| Hwy 11            | 1,144                    | 858        | 0.30       | 0.23       | 3,800 |  |                                      |
| New Crossing      | 253                      | 215        | 0.32       | 0.27       | 800   |  |                                      |
| Total Screenline  | 2,193                    | 1,630      | 0.37       | 0.28       | 5,900 |  |                                      |

## 8.0 TRANSIT SYSTEM OPPORTUNITIES

Although a detailed review of the provision of a conventional transit system within the Town of Bracebridge was not part of the Terms of Reference, it must be acknowledged that transit, may in future, become a fundamental component of any transportation system within any community in Ontario. The existing transit service within the Town of Bracebridge is currently provided mainly for the benefit of tourists. Due to social environmental costs associated with "overuse" of the automobile, increased transit use, even in smaller municipalities, must be encouraged; it must, however, be recognized that the automobile will still represent the most prevalent form of transportation within the community in the future. It is, however, important that any future improvements and developments in the Town of Bracebridge permit logical implementation of transit service in the future. Transit services are provided in communities of a similar size including the Towns of Cobourg and Lindsay.

Although conventional transit service may not currently be financially viable, the possibility exists for the implementation of a para-transit service using vans, taxis or small buses. Transit service could focus on the retail centre on Monck Road or on the downtown area. In smaller communities, much of the transit ridership is comprised of school children. Service could be designed to accommodate the transportation needs of that sector of the community.

One of the problems encountered by municipal agencies in providing bus service in the past, especially in smaller urban areas, has been that many residential subdivisions have been designed primarily for auto use from both a network design and land use perspective. Planning of transit friendly subdivision must be done so between the works or operating

engineers and the land use planners. *There is an inherent relationship between land use and transportation planning and this must be recognized in all land use and development planning.* The following represents some guidelines for consideration of transit in the subdivision design and approval process in the Town of Bracebridge:

- **Subdivision Location and Urban Development Phasing** - Cost effective transit service is compromised when buses are required to travel long distances outside the existing service areas simply reach new developments. New subdivisions should be designed so that when transit service is implemented, buses will not be required to travel long distances outside the existing development areas. Contiguous development should also be encouraged within the community so that any future transit service may be phased inefficiently along permanent routes. Individuals who may be responsible for the provision of future transit service should be intimately involved in the development review process.
- **Land Use** - The provision of cost effective transit service to low density areas is difficult. Operating cost per passenger are increased because the buses must travel longer distances to serve the same number of potential riders.
- **Use of Arterial and Collector Streets** - When the planning of a transit route is divorced from the planning and layout of the principle road network, the transit service efficiency and effectiveness are significantly diminished. Subdivisions must be adequately planned with effective layout for arterial and collector streets. Any roadways to be considered in the future as transit routes should be designed to ensure arterial or collector roadway standards. Ideally, collectors should be spaced to ensure full coverage and avoid duplication of service. In addition to efficient roadway design, it is essential that a neighbouring subdivision be linked by collector or arterial roads. Development plans should contain policies encouraging collector road continuity. Should the municipality be concerned by shortcutting traffic through communities, there are techniques which can be introduced to allow future transit service to travel between communities i.e. bus-only crossings.

- **Pedestrian Access and Amenities** - People who use transit facilities are sensitive to this the distance they must walk to and from their origin and destination. Every effort should be maintained to minimize the average distance required to walk from residences and other facilities to transit services. In Canada, the most commonly accepted walking distance guideline is that all residences and other facilities must be less than 400 m actual walking distance from transit service.
- The District of Muskoka and the Town of Bracebridge, in conjunction with the MTO should consider undertaking a Transit Feasibility Study to initiate plans for future implementation of a transit system.

## 9.0 TRAFFIC BYLAW REVIEW

As part of the Transportation Study, TSH staff conducted a review of the Town of Bracebridge Traffic Bylaw. This review revealed that the bylaw appears to be in good order and although it does not require a major update, consideration should be given to the addition of a section dealing with "Truck Routes". Currently, the Bylaw does not permit the designation of specific routes as "Truck Routes".

## 10.0 ROADWAY JURISDICTIONS

Based on the review of network improvements suggested as part of the Town of Bracebridge Transportation Study, it is recommended that the following future jurisdictional issues be recognized:

1. **West and North Arterial Routes** - It is recommended that both the north and west arterial routes be under Provincial jurisdiction for the following reasons:

- **Service Function** - The two proposed future arterial routes will serve mainly through (interregional) traffic including commercial and cottage oriented traffic. Both routes will start and end at existing Provincial highways enhance highway connectivity in the area.
- It is recommended that direct access to properties *not* be provided from these roadways to maintain a high capacity and a high level of service.

No other jurisdictional changes are recommended within the community as a result of the findings of the Town of Bracebridge Transportation Study.

## 11.0 TRAFFIC IMPACT STUDIES

Many jurisdictions are currently experiencing transportation related problems as a result of not having evaluated the impact of growth on the community whether it be commercial, residential or industrial. Many problems can be avoided by the undertaking of traffic impact studies. Traffic studies would permit Town and District staff to assess the impact of a development on the transportation system and to identify any future transportation improvements that may be required as a result of the development. A formal policy with respect to when a study should be undertaken and what should be contained in the assessment, is provided as part of this documentation.

Traffic impact studies should be required of a developer for:

- Any development proposal (including expansion of an existing development) which would generate more than 50 trips during the peak hour of the adjacent roadway system or the peak hour of the generator itself. The following are examples of developments which would generate, 50 vehicle trips per hour:
  - 50 single family residential units;
  - An office complex of approximately 20,000 SF (1,858 m<sup>2</sup>); and
  - A fast food restaurant;
- For a site where the applicant is requesting some type of relaxation to Official Plan land use guidelines or traffic bylaws;
- Any Official Plan or land use amendment application that is expected to have a transportation system or community impact so determined by the Town or District Engineer in conjunction with the appropriate planning staff;
- An Application for Severance; and
- An Access Permit.

For a residential subdivision, impact studies should be undertaken as part of the planning process (at the secondary plan stage for example). A study should not normally be required unless the development or road system differs substantially from previously approved secondary plans. Some degree of discretion should be used in establishing the need for a study. The decision to require a study should rest with the Town or District Engineer.

In order to provide a degree of consistency, and to ensure that the Town's and District's interests are taken into account, the traffic engineering Consultant could be retained by the Town and/or the District, at the developer's expense. As previously discussed, the purpose of a transportation systems impact study would be to provide the Town or District Engineer with all of the information which would allow the staff to understand *every* transportation related aspect and implication of the proposal and, thereby, enabling the staff to make recommendations to the Town and/or District Council.

The aim of any transportation system impact study would be to substantiate the appropriateness of the proposal: both the development scheme, proposed access and transportation system improvements needed to accommodate it. This aim can best be accomplished by providing a comprehensive study which conforms to policy and standards for design and which provides all the details needed for the Town or District Engineer to undertake a step-by-step review and verification process. The following is a check list of the information that the Town or District should require in an impact study. Some studies may omit some items which are not applicable. Other studies, due to special circumstances, may require additional analysis. Information which may be omitted from the study may be confirmed with the Town or District Engineer prior to initiation of the exercise.

## 11.1 TRAFFIC IMPACT REPORT - CONTENTS

The following information should be provided:

- Site Context:
  - Site and Study Area boundaries (provide map);
  - Existing and proposed site uses;
  - Existing and proposed uses in vicinity of site (provide map); and
  - Existing and proposed roadways and intersections (provide map).
- Details of the Proposal including:
  - Existing and proposed land use;
  - Proposed access;
  - Size of development;
  - Type of development; and
  - Physical characteristics of the site.
- Development approvals and proposals on adjacent sites
- Description of Area Transportation System:
  - Existing; and
  - At time of development opening.
- Trip Generation and Design Hour Volumes (Provide Table):
  - Document fully the sources of rates used; and
  - Reasons for variance from accepted standards.
- Trip Distribution (Provide Matrix Table):
  - Any adjustments for link or bypass trips and captive market effects should be clearly defined and substantiated; and
  - Any market studies undertaken for the subject proposal should be provided with the study.

- **Background Traffic:**
    - Should be shown on diagrams;
    - Text should explain any assumptions or adjustments;
    - Design years should include:
      - Year of opening and any subsequent phases;
      - Planning horizon(s) which correspond to future significant transportation improvements; and
      - If not covered above, a planning horizon which is significantly long term to properly assess the long range impacts of the proposal.
  - **Trip Assignment (Provide Map and Turning Movement Diagrams for Major Intersections):**
    - A.M. peak hour of adjacent street (including turning movements);
    - P.M. peak hour of adjacent street (including turning movements);
    - Existing A.M. peak hour background traffic;
    - Existing P.M. peak hour background traffic;
    - A.M. and P.M. peak hour total traffic for the adjacent street (including site generated and projected background traffic);
    - Any other peak hour traffic necessary to complete study; and
    - Attempts should be made to identify and assess the impact of the development on future traffic volumes. The extent of this work should be discussed with the Town or District Engineer prior to undertaking the study.
  - **Intersection and Roadway Capacity Analysis**
- The following calculations/information should be provided as required:
- **Signalized intersection capacity analysis;**
  - **Unsignalized intersection capacity analysis;**
  - **Weaving analysis;**
  - **Queuing analysis;**

- Signal warrant studies;
- Gap studies;
- Delay studies;
- Laning; and
- Rationalization of proposed access including assessment of corner clearances, driveway spacing, identification of special requirements, etc.

One or more of the above analysis may be omitted in cases where it is not necessary to undertake them in order to arrive at appropriate study conclusions.

The study should also provide information on:

- Traffic signal phasing assumptions;
- Intersection and access configuration assumptions; and
- Other assumptions used as input into the capacity analysis method such as saturation flow volumes, pedestrian crossing requirements, intersection green times, truck and grade adjustments, etc.
- The study should identify means of alleviating all capacity constraints or safety problems which were identified in the area of influence.

**Geometric Design** - In cases where a proposal requires modifications to existing and/or future roadway designs, proper geometric design information must be submitted in conjunction with the study. This information should include plans, profiles, and sections which:

- Comply with proper engineering design standards;
- Are at a scale which permits easy variation;
- Are in scales in units which are compatible with one another;
- Contain geometric design data;

- Contain information on roadway classification and design speeds;
- Identify additional right-of-way requirements;
- Shortcutting - If community traffic shortcutting problems will either be created or aggravated by proposed development, then the study must:
  - Identify the magnitude of the problem; and
  - Identify the measures to eliminate, minimize and/or manage the shortcutting of traffic.
- Pedestrian/cyclists - Some proposals may require discussion of pedestrian/cyclist requirements;
  - Parking;
- Demand and supply and information, justification for proposed variances from the Town's Bylaw, if any;
  - Layout in circulation plans, property dimensions; and
  - Calculations where shared use of parking is proposed.
- Transit - If appropriate, the impact on existing or proposed transit service should be assessed.

The above list is comprehensive, but may not in all instances be all inclusive. The transportation system impact study should aim to fully document and provide substantive evidence as to the appropriateness of the development. It should not require the Town or District Engineer of his staff to do any additional original traffic analysis related to the proposal.

## 12.0 STUDY MAINTENANCE/UPDATE

It is recommended that this report, in conjunction with the accompanying technical data file, be utilized by the Town as a basis for continued monitoring of traffic operations in Bracebridge. *A transportation planning update should be undertaken every five years.* It is important that the data file be kept current to reflect changes in growth and development that affect traffic patterns.

### 12.1 TRAFFIC VOLUMES

Data updates should consist of traffic volume counts at key intersections and capacity analysis.

Automatic counts provide a continuous record of passing traffic and given accurate indication of variation and flow and of the times at which significant changes and conditions take place. Ideally, the counts should be directional and cover a seven day period. As a minimum, counts should cover a 24 hour period on a weekday (Tuesday-Thursday). In addition, to providing data on a weekly and hourly traffic variation, growth factors may be determined from automatic count records for predicting future requirements.

Relative to other jurisdictions of a similar size, the Town of Bracebridge generally maintains few traffic data files/records with relatively out of date information. With respect to frequency of automatic traffic counts, it is suggested that counts be undertaken on major roadways within the Town on at least a bi-annual basis. It is also recommended that automatic counts be undertaken for a 24 hour period as a minimum. Factors are available to convert counts to AADT and SADT values.

Manual counts are generally conducted at intersections to determine the volume and direction of pedestrian and vehicular movements, as well as the composition of vehicular traffic. Generally, manual turning movement counts need only cover the two hour period of peak traffic flow as determined from the automatic count traffic records. For detailed operational design in the determination of traffic signal warrants, manual counts covering an eight hour period are required. For the upgrading of signal timing (where applicable), manual counts should be performed on an annual basis (every two years as a minimum) at major signalized and other major intersections preferably on the same date, and reflect average traffic conditions. Minor intersections and roadway links should be counted on a bi-annual basis.

Table 20

**Town Of Bracebridge Transportation Study  
Recommended Improvements**

| Location and Recommendations                                                                                                                                                                                                                                               | Date Required | Estimated Cost<br>(1994 \$) | Comments                                                                                                                    | Text Reference         | Justification |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|
| <b>1.0 INTERSECTIONS</b>                                                                                                                                                                                                                                                   |               |                             |                                                                                                                             |                        |               |
| 1.1 Manitoba Street/Monck Road<br>(a) Signal timing revision.                                                                                                                                                                                                              | NOW           | 500                         |                                                                                                                             | 5.1, 5.3, 6.1          | District      |
| 1.2 Manitoba Street/Dominion Street<br>(a) Implement a Northbound to Westbound left turn restriction                                                                                                                                                                       | NOW           | 1000                        |                                                                                                                             | 5.3, 6.2.1             | District      |
| 1.3 Manitoba Street/Ontario Street<br>(a) Install traffic signals                                                                                                                                                                                                          | 2001          | 70,000                      | Signal warrant analysis is required to confirm the need                                                                     | 5.1, 6.2.1             | District/Town |
| 1.4 Wellington Street/Beaumont Drive<br>(a) Construct N/B and S/B left turn lanes                                                                                                                                                                                          | Now           | 46,000                      |                                                                                                                             | 5.1, 6.1.3             | District      |
| <b>2.0 ROADWAY LINKS</b>                                                                                                                                                                                                                                                   |               |                             |                                                                                                                             |                        |               |
| 2.1 Wellington Street<br>(a) Construct a centre two-way turning lane on Wellington Street from the Wellington Street Bridge to Highway 118                                                                                                                                 | 1993/94       | 340,000                     | A detailed design study will be required prior to implementation<br><br>Schedule B Class Environmental Assessment required. | 5.3, 6.2.2, 7.4.1, 7.5 | District      |
| 2.2 Traffic flow in the following school areas should be monitored on a regular basis to ensure public safety:<br><br><ul style="list-style-type: none"> <li>- Cedar Lane</li> <li>- Balls Drive</li> <li>- Wellington Street North</li> <li>- District Road 14</li> </ul> | NOW           | N/C                         | Specific attention should be given to speed limits and proper signage                                                       | 5.3, 6.6               | Town/District |

Table 20 Continued

Table 20 Cont'd

**Town Of Bracebridge Transportation Study  
Recommended Improvements**

| Location and Recommendations                                                                                                                             | Date Required | Estimated Cost<br>(1994 \$) | Comments                                                       | Text Reference                             | Jurisdiction      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|----------------------------------------------------------------|--------------------------------------------|-------------------|
| <b>3.0 ALTERNATIVE NETWORK IMPROVEMENTS</b>                                                                                                              |               |                             |                                                                |                                            |                   |
| (a) Construct North Arterial Route as a 2-lane rural road.                                                                                               | Beyond 2011   | 6,900,00                    | Cost include construction of Bridge(s), Railway Interchange(s) | 7.2, 7.3.1, 7.3.2, 7.4.2, 7.5, 10.0        | MTO/District/Town |
| (b) Construct West Arterial Route as a 2 lane rural road.                                                                                                | 2011          | 18,700,00                   |                                                                | 6.2.2, 7.2, 7.3.1, 7.3.2, 7.4.1, 7.5, 10.0 | MTO/District/Town |
| (c) Construct a new interchange at Hwy 11/District Road 37                                                                                               | 1996          | 4,830,000                   |                                                                | 7.2, 7.3.1, 7.3.2, 7.4.3, 7.5              | MTO               |
| (d) Realign Fraserburg Road W. of Hwy 11 to rectify Horizontal and Vertical alignment deficiencies.                                                      | NOW           | 1,100,000                   |                                                                | 7.3.1, 7.5                                 | District/MTO      |
| <b>4.0 ALTERNATE DOWNTOWN ROUTES</b>                                                                                                                     |               |                             |                                                                |                                            |                   |
| (a) Implement an alternate truck route utilizing the Main Street/Tiram Street link                                                                       | NOW           | 5,000                       | Cost includes signing and pavement marking only                | 5.2, 5.3, 6.2.1, 6.3                       | Town              |
| <b>5.0 PARKING</b>                                                                                                                                       |               |                             |                                                                |                                            |                   |
| (a) Enforce parking regulations to promote efficient use of existing parking facilities.                                                                 | NOW           | N/C                         |                                                                | 4.5                                        | District          |
| <b>6.0 SIGNING AND PAVEMENT MARKING</b>                                                                                                                  |               |                             |                                                                |                                            |                   |
| (a) Town and District should undertake a sign inventory to ensure all existing traffic signs and pavement markings are in compliance with MTO standards. | NOW           | N/C                         | Required for budgeting, maintenance and legal reasons.         | 4.6, 6.4, 6.5                              | Town/District     |

Notes: N/C - Not Costed  
Cost Estimates Do Not Include Property Costs.  
Costs are in 1994 Uninflated Dollars

### 13.0 SUMMARY OF RECOMMENDATIONS

All of the recommendations found in the body of the report involving physical or operation improvements are summarized in Table 20. Brief project descriptions, implementation date, approximate construction cost and text reference are included in the table. Property acquisition costs have not been calculated. Additional recommendations are as follows:

1. The majority of major signalized and unsignalized intersections are currently operating at level of service considered acceptable by transportation professionals. In addition, the majority of roadway links within the Town are currently operating at an acceptable level of service. With the network revisions proposed as part of this study, the majority of roadway links will operate at an acceptable level of service to the 2011 planning horizon.
2. In order to rectify problems relating to local and non-local truck traffic within the downtown area, and in particular at the intersection of Manitoba Street and Thomas Street, the following strategy is recommended:

- The Town should designate a truck route which involves the use of Main Street, Hiram Street and McDonald Street to provide an alternate route to Manitoba Street between Monck Road and Thomas Street. This route should be designated through the use of the appropriate informational signing. In order to provide an improved facility for truck and auto traffic, it is recommended that the Town of Bracebridge in conjunction with the District Municipality of Muskoka undertake a Functional Design Review to determine if any geometric improvements are required along this route.
- This route is currently classified as a collector facility by the Town.

3. The District of Muskoka should initiate a Schedule Class Environmental Assessment for the widening of Wellington Street from the Wellington Street Bridge to Monck Road. If approved, this should be followed by a detailed design study. The roadway should be widened to provide a two-way centre left turn lane.

4. The need for additional north-south and east-west arterial roadway capacity has been confirmed for the community. There is sound justification for the Town, District and MTO to proceed with preliminary design, and ultimately completion of Environmental Assessments (Route Planning Studies) and construction for these facilities.

Specifically, and in order to confirm the location of future roadway links within the Town of Bracebridge and to ensure that property can be adequately protected, it is recommended that additional studies be undertaken for the following facilities:

- The proposed westerly arterial route from Highway 11 to Highway 118 West;
- The proposed northerly arterial route from Highway 11 to Highway 118 West;

Environmental Assessment or Route Planning Studies should be undertaken for both of these facilities. Future Studies should deal with the following basic issues:

- Confirmation of need and justification;
  - Natural and social environmental considerations;
  - Identification of right-of-way requirements, and
  - Economic assessment of the impact of such a facility on businesses in the Town.
- Future Studies should again review all alternatives to the provision of additional north-south and east-west arterial roadway capacity in the area.

It is fundamental to recognize that, without an approved Environmental Assessment Study, property cannot be *actively* pursued for any of the above new roadway facilities. Property can, however, be obtained on an opportunity basis, i.e. the owner sells the property to the proponent (roadway authority) or the property is obtained through the development or re-development process. It should also be recognized that Class Environmental Assessments for municipal road projects currently have a "shelf life" of approximately 5 years. A similar "shelf life" exists for Provincial Route Planning Studies. Environmental Assessment Studies could be conducted as part of the development and the review process. This could be applicable in the case of the proposed Royal Muskoka Development in the south-west portion of the community.

5. Arising from a review of potential interchange alternatives on Highway 11, it is recommended that Fraserburg Road between Highway 11 and District Road 37 be realigned and reconstructed as shown in Exhibit 15. Responsibility for upgrading Fraserburg Road should be shared by the District Municipality of Muskoka and MTO. It is also recommended that preliminary and detail designs be initiated by the District and MTO. This project will likely be a Schedule B Class Environmental Assessment.

6. The Town of Bracebridge should maintain and update the technical data provided as part of this report by initiating a regular traffic count program in conjunction with the District Municipality of Muskoka. Major intersection and roadway links should be counted and assessed as recommended in the text.

7. The Town of Bracebridge and the District Municipality of Muskoka should require that Traffic Impact Studies be submitted in conjunction with all development applications consistent with the guidelines proposed in Section 11.0 of this report.

8. Enforcement of on-street parking restrictions in the downtown area, particularly around the intersection of Manitoba Street and Thomas Street should continue to be a high priority for the District Municipality of Muskoka. Both illegal parking and some double parking was observed in the area of the intersection. These conditions significantly affect capacity at the intersection and also hinder turning movements for larger vehicles.

9. The Town of Bracebridge and the District Municipality of Muskoka should ensure that the transit guidelines detailed in the text of the report are incorporated into the assessment and/or design of future subdivision or developments in the municipality. All development applications should be reviewed by staff responsible for transportation planning in the Town.

10. The District Municipality of Muskoka in conjunction with the Town of Bracebridge and MTO should consider the undertaking of a Transit Study to initiate plans for future implementation of a transit system within the area. The Terms of Reference for such a study should require that the following issues be addressed:

- Identification of service area and development of ridership projections;
- Identification of system alternatives:
  - Public operation;
  - Private operation; and
  - Para-transit service, etc.
- Vehicle requirements;
- Identification of an implementation timetable;
- Identification of system operating parameters including the type of service to be offered, i.e. conventional versus para-transit;
- Completion of economic analysis;
- Management structure; and
- Potential routes, terminals, etc.

Although implementation of a transit system may not be immediately imminent, it would be appropriate to ensure that all future development planning is conducted with the possible implementation of a transit system in mind.

11. As a pedestrian or bicycle route system forms an integral part of the Town of Bracebridge and the District Municipality of Muskoka should undertake a study to identify a definitive pedestrian and cycle network incorporating recommendations from the Town of Bracebridge Transportation Study. Included within the context of a review of the pedestrian and cycle network should be a review of the possibility of combining snowmobile routes in the community with possible pedestrian and cycle routes. The future plan resulting from the above review should be used to provide guidance to developers and in the assessment of future development applications. The Town and District should encourage bicycle and pedestrian routes linking green spaces and providing access to major activity and employment centres.

When considering the construction or reconstruction of roads and bridges, the Town and District should investigate and provide for bicycle lanes wherever possible. As a condition of approval of site plan applications, the Town and/or the District should require the provision of bicycle storage space and facilities.

12. Where necessary, the Official Plans for the appropriate municipality should be amended to reflect the future transportation requirements depicted in this document.

13. The Town of Bracebridge should consider the appropriate amendments to the Town's Traffic Bylaw to permit the designation of "Truck Routes" within the Town.

14. A Transportation Planning Study *update* should be undertaken within the Town of Bracebridge every five years to ensure that changes in local demographics and traffic patterns can be regularly addressed. In order to facilitate such an update, population and employment data should be maintained and updated on a regular basis.