

**ORSI  
DEVELOPMENT  
Township of  
Severn**

**Traffic Impact  
Assessment**

**prepared for:  
Simcoe Estates Limited**

**CT105015-1  
December 2005**

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## 1 INTRODUCTION

✓ Cansult Tatham Transportation Consultants were retained by Simcoe Estates Limited to prepare a traffic impact assessment in support of a proposed residential development located on Menoke Beach Road just east of Highway 11 in the Township of Severn. The location of the proposed development is illustrated in Figure 1.

✓ The purpose of this study is to address the requirements of Severn Township and the Ministry of Transportation (MTO) given that the development will have direct accesses to Menoke Beach Road and will subsequently increase volumes at its adjacent intersection with Highway 11 northbound. Likewise, it will increase volumes on Ardtrea Drive and at intersections of Soules Road with Division Road, Telford Line with Division Road East, and Telford Line with Highway 11 southbound.

In particular, the traffic study will address the following:

- the operations of the road system through the study area prior to the development;
- an estimation of the number of new trips that the proposed development is likely to generate;
- an estimation of the growth in the traffic volumes not attributable to the proposed development (i.e. from overall growth in the area);
- the operations of the study area road system upon completion of the proposed development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

✓ Chapter 2 of this report addresses the existing conditions, detailing the road system and corresponding traffic operations. Chapter 3 deals with future background conditions, prior to the completion of the proposed development, and will address the expected growth in the traffic levels and the resulting operating conditions. Chapters 4 and 5 deal with the proposed development, the ensuing vehicle trips that it will generate and the associated impacts on the road system. Lastly, Chapter 6 summarizes the report and the key findings.

**Figure 1: Site Location**

## 2 EXISTING CONDITIONS

✓ This chapter will describe the road network, traffic volumes and operations for the existing conditions.

### 2.1 ROAD NETWORK

✓ The existing road network to be addressed by this study, as it pertains to the proposed development, consists of Highway 11, Menoke Beach Road (to which site access will be provided), Telford Line, Division Road, Soules Road and Ardtrea Drive. Photographs of the road system are provided in Figure 2.

#### 2.1.1 Road Sections

Menoke Beach Road is a local Township road. It provides a single lane per direction with gravel shoulders (approximately 1.0 metre wide). Only upon its approach to Highway 11, are there pavement markings. From the development site to Highway 11, the road profile is slightly rolling with short vertical curves. Its intersection with Highway 11 provides an approximate 50° angle. There is no speed limited posted on Menoke Beach Road and hence an 80 km/h speed limit is assumed (typical of rural roads not otherwise posted) and a 100 km/h design speed applies (speed limit + 20 km/h for higher speed roads).

Ardtrea Drive is also a local Township road, provides a single lane per direction with gravel shoulders (approximately 1.0 metres wide) and has no pavement markings. Upon intersecting with Menoke Beach Road, the road profile is relatively flat. An 80 km/h speed limit is also assumed and a 100 km/h design speed applies.

Soules Road is under the jurisdiction of the Township and provides a single lane per direction with wider gravel shoulders (approximately 2.0 metres wide). Soules Road is appropriately marked with respect to pavement markings. Upon intersecting with Division Road, the road profile is relatively flat and straight. An 80 km/h speed limit is also assumed and a 100 km/h design speed applies.

Hwy 11 ?  
Division Road is also under the jurisdiction of the Township, and provides a single lane per direction with gravel shoulders (approximately 2.0 metres wide) and pavement markings. It overpasses Highway 11, and intersects with Division Road East, from which point it is referred to as Division Road East. There is no speed limit posted on Division Road and hence an 80 km/h speed limit is assumed and a 100 km/h design speed applies.

Telford Line is also a local Township road. It also provides a single lane per direction with wide gravel shoulders (approximately 2.0 metres wide). Pavement markings only exist from Division Road East to Highway 11, and the road profile is relatively flat through this section. The posted speed limit in the area is 50 km/h and a 60 km/h design speed applies.

**Figure 2: Study Area Road System**

**Figure 2b**

**Figure 2c**



✓ Highway 11 is under the jurisdiction of the MTO. It is divided and provides two travel lanes per direction with asphalt shoulders. The road has a posted speed limit of 90 km/h and hence a 110 km/h design speed applies. There are both deceleration and acceleration lanes on the highway to facilitate travel to/from both Telford Line and Menoke Beach Road. The deceleration lanes are approximately 150 metres in length (parallel lane + taper) whereas the acceleration lanes are approximately 450 metres.

### 2.1.2 Key Intersections

✓ The intersection of Menoke Beach Road with Highway 11 northbound is yield controlled on Menoke Beach Road, the east approach. Traffic can only make a right turn from Highway 11 to Menoke Beach Road or a right turn from Menoke Beach Road to Highway 11.

✓ The intersection of Telford Line with Highway 11 southbound is similarly configured with yield control on Telford Line, the west approach. Traffic can only make a right turn from Highway 11 to Telford Line or a right turn from Telford Line to Highway 11.

✓ The intersection of Menoke Beach Road with Ardtrea Drive (opposite to which a site access will be provided), is a "T" intersection, stop controlled on Ardtrea Drive. Each approach to the intersection provides a single shared lane – no exclusive turn lanes or tapers are provided.

✓ The intersection of Soules Road with <sup>HWY 11</sup> Division Road is also a "T" intersection, stop controlled on <sup>NWY 11</sup> Division Road. Each approach to the intersection also provides a single shared lane – no exclusive turn lanes or tapers are provided.

✓ The intersection of Telford Line with Division Road East/Centre Avenue is a 4-leg intersection, stop controlled on both Division Road East and Centre Avenue. Each approach to the intersection provides a single shared lane – no exclusive turn lanes or tapers are provided.

## 2.2 EXISTING TRAFFIC VOLUMES

Information with respect to Highway 11 traffic volumes through the study area has been compiled from a number of sources (additional information is provided in Appendix A):

- ✓ historic traffic counts provided by the Ministry of Transportation (MTO) for the section of Highway 11 extending from Laclie Street to Brailey Line (counts from 1988 to 2000); and
- ✓ traffic counts (from April/May 2003) for the section of Highway 11 from Laclie Street to Muskoka Road 169, provided in the *Highway 11 Study Design Report – Barrie to Gravenhurst Traffic Operations Report*<sup>1</sup>.

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<sup>1</sup> *Highway 11 Study Design Report – Barrie to Gravenhurst Traffic Operations Report*. URS Canada Inc., July 2004.

Based on the latter report, traffic volumes on Highway 11 were determined to be in the order of 4440 vehicles per hour with a directional distribution of approximately 50/50 (eg. 50% northbound/50% southbound).

Traffic volumes on <sup>①</sup> Menoke Beach Road at Ardtrea Drive, <sup>②</sup> Soules Road at Division Road, <sup>③</sup> and Telford Line at Division Road East/Centre Avenue were determined from intersection counts completed on April 21, 26, and 28, 2005 respectively, during both the AM and PM peak periods. These counts are considered reflective of average conditions given the time of year they were completed.

In recognition of the increased summer volumes through the area, consideration has been given to a summer peak period. As per traffic data for the subject section of Highway 11, the summer average daily traffic volumes are in the order of 20% greater than the average annual daily traffic volumes. As such, the existing 2005 traffic counts were increased by 20% to reflect peak summer conditions.

The resulting 2005 summer weekday peak hour traffic volumes are presented in Figure 3.

### 2.3 EXISTING TRAFFIC OPERATIONS

The capacity, and hence operations, of a road system is effectively dictated by its intersections. As such, the analysis focused on the operations of the intersections of <sup>①</sup> Menoke Beach Road with Ardtrea Drive, <sup>②</sup> Soules Road with Division Road, <sup>③</sup> Telford Line with Division Road East/Centre Avenue, <sup>④</sup> Menoke Beach Road with Highway 11 northbound, and <sup>⑤</sup> Telford Line with Highway 11 southbound. This will provide the baseline from which the future traffic volumes and operations (both with and without the subject development) can be assessed. The analysis is based on the 2005 summer traffic volumes, the existing intersection configurations and control, and procedures outlined in the *2000 Highway Capacity Manual*<sup>2</sup>.

The intersections of Highway 11 with Telford Line and Highway 11 with Menoke Beach Road were analyzed based on the premise that they operate as on/off ramps to the highway (motorists are not required to stop on the sidestreet prior to proceeding onto the highway).

A summary of the analysis is provided in Table 1 in the form of average delay (measured in seconds) and level of service (LOS) for the minor street, stop controlled moves, and in the form of level of service only for merge and diverge moves to and from Highway 11. LOS A corresponds to the best operating condition with minimal delays whereas LOS F corresponds to unacceptable operations resulting from high intersection delays. Detailed worksheets and LOS definitions are included in Appendix B.

<sup>2</sup> *Highway Capacity Manual*. Transportation Research Board, Washington DC, 2000.

**Figure 3: 2005 Traffic Volumes**

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**Table 1: Intersection Operational Analysis – 2005 Traffic Volumes**

Intersection		AM Peak Hour		PM Peak Hour	
		delay (s)	LOS	delay (s)	LOS
✓ Highway 11 & Menoke Beach Road	NB (merge)	-	C	-	C
	SB (diverge)	-	C	-	C
✓ Menoke Beach Road & Ardtrea Drive	EB	7	A	9	A
✓ Highway 11 & Soules Road & Division Road	EB	10	A	10	A
✓ Telford Line & Division Rd E/Centre Ave	NB	9	A	10	A
	SB <sup>1</sup>	11	B	10	B
✓ Highway 11 & Telford Line	EB (merge)	-	C	-	C
	WB (diverge)	-	C	-	C

<sup>1</sup> the southbound approach is Centre Avenue

Based on the projected volumes, the intersections of Menoke Beach Road with Ardtrea Drive, Soules Road with Division Road, and Telford Line with Division Road East/Centre Avenue currently provide excellent levels of service during both peak hours, with minimal delays. The intersections of Highway 11 with Menoke Beach Road and Telford Line provide acceptable levels of service, with reasonable delays. As such, no improvements to the existing intersection configurations and/or control are required.

### 3 FUTURE BACKGROUND CONDITIONS

This section will describe the transportation system expected for the 2010 (5-year) and 2015 (10-year) horizons. The 5-year horizon has been adopted to reflect full build-out and occupancy of the proposed development whereas the 10-year horizon will address the longer-term impacts, as required by MTO.

#### 3.1 ROAD NETWORK

No significant improvements to Menoke Beach Road, Ardtrea Drive, Soules Road, Division Road, Division Road East, or Telford Line are expected to occur throughout the horizon years, with the exception of routine maintenance. The *Highway 11 Barrie to Gravenhurst Study Design Report*<sup>1</sup> identifies the need for an additional lane on Highway 11 in each direction to serve the existing peak hour volumes. However, as indicated by MTO, such a widening is not scheduled within the next 10 years.

#### 3.2 BACKGROUND TRAFFIC VOLUMES

Background traffic volumes expected for the 2010 and 2015 horizon years have been determined from the 2005 volumes and future growth projections. In consultation with MTO, an annual growth rate of 2% was indicated to be sufficient for the study area. For the 5-year planning horizon, this translates to an overall increase of 10%, whereas for the 10 year period, an overall increase of 20% is expected. In each case, a simple growth factor has been employed (eg. 2% per year x 5 years = 10% growth) as directed by the MTO for a previous project.

The resulting 2010 and 2015 background traffic volumes are illustrated in Figure 4 and Figure 5 respectively.

#### 3.3 BACKGROUND OPERATIONS

The operations of the intersections of interest were again investigated given the expected increases in traffic volumes. The results are presented in Table 2 for the 2010 and 2015 horizons, whereas detailed worksheets are included in Appendix B.

Despite the increase in background volumes, the intersections of Menoke Beach Road with Ardtrea Drive, Soules Road with Division Road, Telford Line with Division Road East/Centre Avenue will continue to provide excellent levels of service during both peak hours, with minimal delays. The intersections of Highway 11 with Menoke Beach Road, and Telford Line will also continue to provide acceptable levels of operation with reasonable delays. It is noted that should Highway 11 be widened to 3 lanes per direction, the levels of service for both Highway 11 intersections will improve to a B for all periods considered.

Figure 4: 2010 Background Traffic Volumes

**Figure 5: 2015 Background Traffic Volumes**

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**Table 2: Intersection Operational Analysis – Future Background Traffic Volumes**

Intersection			AM Peak Hour		PM Peak Hour	
			delay (s)	LOS	delay (s)	LOS
2010	Highway 11 & Menoke Beach Road	NB (merge)	-	C	-	C
		SB (diverge)	-	C	-	C
	Menoke Beach Road & Ardrea Road	EB	9	A	9	A
	Soules Road & Division Road	EB	10	A	10	A
	Telford Line & Division Road East/Centre Avenue	NB	10	A	10	A
		SB <sup>1</sup>	12	B	10	B
	Highway 11 & Telford Line	EB (merge)	-	C	-	C
		WB (diverge)	-	C	-	C
2015	Highway 11 & Menoke Beach Road	NB (merge)	-	C	-	C
		SB (diverge)	-	C	-	C
	Menoke Beach Road & Ardrea Road	EB	9	A	9	A
	Soules Road & Division Road	EB	10	B	10	A
	Telford Line & Division Road East/Centre Avenue	NB	10	A	10	A
		SB <sup>1</sup>	12	B	11	B
	Highway 11 & Telford Line	EB (merge)	-	C	-	C
		WB (diverge)	-	C	-	C

<sup>1</sup> the southbound approach is Centre Avenue



## 4 PROPOSED DEVELOPMENT

This chapter will provide additional details with respect to the proposed development, including its location, the projected site generated traffic volumes and the assignment of the site traffic to the road network.

### 4.1 SITE LOCATION & ACCESSES

As illustrated in Figure 1, the proposed development is located on Menoke Beach Road, just east of Highway 11. A proposed site plan is illustrated in Figure 6 for the north parcel and Figure 7 for the south parcel. In total, 6 new site access points will be provided. The second access from the north is noted directly opposite Ardrea Drive (an existing road).

### 4.2 LAND USE

The development consists of two parcels. The north parcel is to consist of single-family residential units only whereas the south parcel is to consist of single-family and 4-plex residential units, as detailed below:

North parcel

- 480 single family units

South parcel

- 203 single family units; and
- 68 units in seventeen 4-plex buildings.

### 4.3 SITE GENERATED TRIPS

#### 4.3.1 Trip Generation

Trip generation rates for the proposed land uses were determined from the *ITE Trip Generation Manual* based on the single family detached and residential condo/townhouse land uses (ITE land use code 210 and 230 respectively). The resulting trip rates and corresponding trip estimates are provided in Table 3. It is noted that the trip rates are provided as trips per residential unit and the trip estimates are based on a total of 683 single family units and 68 4-plex units (17 buildings x 4 units per building = 68 units).

Table 3: Trip Generation Rates & Estimates

Parcel	Land Use	Trip Rate /Estimate	AM Peak Hour			PM Peak Hour		
			In	Out	TOTAL	In	Out	TOTAL
North	Single family units (480)	rate	0.19	0.56	0.75	0.65	0.36	1.01
		estimate	90	270	360	310	175	485
South	Single family units (203)	rate	0.19	0.56	0.75	0.65	0.36	1.01
		estimate	38	114	152	131	74	205
	4-plex units (68 units)	rate	0.07	0.37	0.44	0.36	0.18	0.54
		estimate	5	25	30	25	12	37
Total Trips			133	409	542	466	260	727

**Figure 6: Proposed Site Plan – north parcel**

**Figure 7: Proposed Site Plan – south parcel**

In total, the development is expected to generate 542 trips in the AM peak hour and 727 trips in the PM peak hour (total of inbound and outbound trips).

#### 4.3.2 Trip Distribution & Assignment

Based on the traffic volumes at the intersection of Menoke Beach Road with Ardtrea Drive, a directional split of 25% to/from Highway 11 north and 75% to/from Highway 11 south via Ardtrea Drive, Soules Road, Division Road, Division Road East, and Telford Line was determined. This is considered reasonable and appropriate for this study given that the closest urban centres (major trip attractors) are the cities of Orillia and Barrie, located just south of the site.

As there will be seven site access points to Menoke Beach Road (six new access points plus the existing ~~Wood Street~~ access), the proposed development site has been divided into seven sub-areas. Traffic generated from each sub-area was assigned to the corresponding access based on proximity and directness of travel route, and then subsequently assigned to Menoke Beach Road, Ardtrea Drive, Soules Road, Division Road, Division Road East, Telford Line and Highway 11 based on the above distribution. The resulting site generated traffic volumes are illustrated in Figure 8.

CUNGHING  
AVG

**Figure 8: Site Generated Traffic Volumes**

## **5 TRANSPORTATION IMPACTS**

This section will address the impacts of the traffic generated by the proposed development.

### **5.1 FUTURE TOTAL TRAFFIC VOLUMES**

✓ To assess the impacts of the increased traffic volumes resulting from the proposed development, the site generated traffic was combined with the 2010 and 2015 background traffic volumes. The resulting 2010 and 2015 total traffic volumes are presented in Figure 9 and Figure 10 respectively.

### **5.2 OPERATIONAL ANALYSIS**

✓ The operational assessments of the study area intersections were repeated based on the 2010 and 2015 future total volumes. The operation of the first site access point from the north at Menoke Beach Road was also analyzed. The results are summarized in Table 4 and provided in Appendix B.

✓ As compared to the 2010 and 2015 background operating conditions, the additional site generated traffic has minimal impacts on the operations at all six intersections. In all cases, excellent to acceptable operations will continue to be provided for all approaches. While the delays for the westbound movement and eastbound movement on Ardrea Drive will increase, they remain acceptable. Furthermore, the volumes on these approaches are minimal.

✓ The merge/diverge operations at the intersections of Highway 11 with Menoke Beach Road and Telford Line were also reviewed, should the widening of Highway 11 to three lanes per direction not occur by 2015 as assumed (eg. existing 2-lane per direction is maintained). The expected levels of service are C during the AM and PM peak hour and thus they are considered acceptable. Should the highway be widened, the level of service will be improved to LOS B for all scenarios considered.

✓ While not explicitly addressed, all other site access points are expected to provide excellent levels of service given the limited volumes and assumed stop control with single lane approaches.

**Figure 9: 2010 Total Traffic Volumes**

**Figure 10: 2015 Total Traffic Volumes**



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**Table 4: Intersection Operational Analysis – Future Total Traffic Volumes**

Intersection			AM Peak Hour		PM Peak Hour	
			delay (s)	LOS	delay (s)	LOS
2010	✓ Highway 11 & Menoke Beach Road	NB (merge)	-	C	-	C
		SB (diverge)	-	C	-	C
	✓ First Site Access Point at Menoke Beach Road	WB	11	B	14	B
		SB	8	A	8	A
	✓ Menoke Beach Road & Ardrea Road	EB	14	B	17	C
		WB	16	C	18	C
	✓ Soules Road & Division Road	EB	12	B	12	B
	✓ Telford Line & Division Road East/Centre Avenue	NB	12	B	12	B
		SB <sup>1</sup>	19	C	16	C
	✓ Highway 11 & Telford Line	EB (merge)	-	C	-	C
WB (diverge)		-	C	-	C	
2015	✓ Highway 11 & Menoke Beach Road	NB (merge)	-	C	-	C
		SB (diverge)	-	C	-	C
	✓ First Site Access Point at Menoke Beach Road	WB	11	B	14	B
		SB	8	A	8	A
	Menoke Beach Road & Ardrea Road	EB	14	B	21	C
		WB	17	C	19	C
	Soules Road & Division Road	EB	12	B	12	B
	Telford Line & Division Road East/Centre Avenue	NB	12	B	13	B
		SB <sup>1</sup>	20	C	16	C
	Highway 11 & Telford Line	EB (merge)	-	C	-	C
WB (diverge)		-	C	-	C	

**5.3 TURN LANE REQUIREMENTS**

Notwithstanding the good intersection operations, the need for a left turn lane at the intersections of Menoke Beach Road with Ardrea Drive, Soules Road with Division Road and Telford Line with Division Road East/Centre Avenue was investigated based on the 2010 and 2015 total volumes. Due to the very light opposing volumes (less than 100 vph) at the intersections of Telford Line with Division Road East/Centre Avenue and <sup>over 50</sup> Division Road with Soules Road, no left turn lanes will be required at both intersections. However, a left turn lane is warranted on the north approach of Menoke Beach Road at

Ardrea Drive, based on a 100 km/h design speed and the PM peak hour volumes for both the 2010 and 2015 horizons (the warrant is provided in Appendix C). The left turn lane should include a minimum storage lane of 15 metres, a parallel lane of 70 metres and a taper of 160 metres, based on MTO standard.

Likewise, the need for a left turn lane at the new site access points was also reviewed, due to the light opposing volumes or the light advancing volumes (either one less than 100 vph), no left turn lanes are required for these intersections.

Right turn lanes are required when right turning traffic volumes exceed 60 vehicles per hour at unsignalized intersections. Based on this, a right turn lane is warranted for Menoke Beach Road at Ardrea Drive north approach, Soules Road at Division Road north approach, and Division Road East at Telford Line south approach. However, due to the very light combined through and left turn traffic volumes on the north approach of Soules Road at Division Road and the south approach of Division Road East at Telford Line, no right turn lanes are required on both approaches. A right turn lane is only required on the north approach of Menoke Beach Road at Ardrea Drive.

Given the presence of deceleration lanes and acceleration lanes providing access to/from both Menoke Beach Road and Telford Line from/to Highway 11, there is no need for additional improvements at these intersections to serve the proposed development. The existing intersection configurations are sufficient to accommodate the projected volumes.

#### 5.4 SIGHT LINE ASSESSMENT

As evident in Figure 2, the horizontal and vertical alignment of Highway 11 at both Menoke Beach Road and Telford Line is relatively straight and flat. While Highway 11 increases in grade from the Division Road overpass to the south, acceptable sight lines are provided. Similarly, Telford Line at Division Road East and Soules Road at Division Road are relatively straight and flat, with the exception of Telford Line slightly increasing in grade as it approaches the highway. Menoke Beach Road from Wood Street south to Highway 11 is relatively straight, while there are a few short vertical curves to the north, they are not considered significant.

Based on MTO geometric design standards, the minimum stopping sight distances for design speeds of 60 km/h (Telford Line), 100 km/h (Menoke Beach Road and Soules Road) and 110 km/h (Highway 11) are 85, 185 and 215 metres respectively. This provides sufficient distance for an approaching vehicle to observe a stationary hazard in the road (ie. a vehicle stopped at an intersection waiting to complete a turn) and bring the vehicle to a complete stop prior to the hazard.

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✓ The available sight lines along Highway 11, as determined at Menoke Beach Road and Telford Line, exceed the minimum MTO stopping sight requirement of 215 metres. As such, adequate sight lines are provided in both directions to ensure safe operations for vehicles turning to/from both Menoke Beach Road and Telford Line.

Likewise, there are good sight lines along Menoke Beach Road from the first site access from the north to Wood Street, the last site access. At Ardrea Drive to the north, the intersection of Highway 11 is visible and thus oncoming cars are readily apparent. To the south, the sight distance is in excess of 185 metres, beyond which it is limited by a vertical curve. Similarly, at each new site access, excellent sight lines are provided. At <sup>Concession</sup> Wood Street to the south, the sight distance is more than 185 metres, beyond that it is limited by a horizontal curve bending Menoke Beach Road to the west.

✓ Excellent sight lines are also provided along Telford Line at Division Road East, and along Soules Road at Division Road.

✓ As a result, no improvements to address sight line constraints are required.

## 6 SUMMARY

This study has addressed the transportation impacts associated with the proposed residential subdivision located on Menoke Beach Road just east of Highway 11 in the Township of Severn. In total, the development will consist of 751 residential units (683 single family units and 68 units in 4-plex buildings) and is expected to generate 460 trips in the AM peak hour and 602 trips in the PM peak hour. All development traffic will access Menoke Beach Road via one of six access points, and is expected to continue to Ardtrea Drive, Soules Road, Division Road, Telford Line and/or Highway 11 travelling south to the City of Orillia and beyond, or to the north.

To address the potential impacts of the proposed development, peak summer operations at the intersections of Menoke Beach Road with Ardtrea Drive, Soules Road with Division Road, Telford Line with Division Road East/Centre Avenue, Highway 11 with Menoke Beach Road and Highway 11 with Telford Line were reviewed for 2010 and 2015 horizons, for both the AM and PM peak hours. The 5-year horizon corresponds to full build-out of the proposed development whereas the 10-year horizon considers the longer term impacts. Based on the assessment, it was determined that the site generated traffic can be accommodated on the road system with no operational impacts (ie. all intersections will operate acceptably with minimal to reasonable delays).

With respect to the need for exclusive turn lanes, the additional site generated traffic will warrant a right turn lane and a left turn lane on the north approach of Menoke Beach Road with Ardtrea Drive, as determined for both the 2010 and 2015 horizons.

Sight lines were reviewed at each related intersection and along Highway 11. In all cases, the available sight distances exceed the minimum stopping sight distance. As such, vehicles manoeuvring to/from the development can do so in a safe and efficient manner.

Submitted By:  
**CANSULT TATHAM TRANSPORTATION CONSULTANTS**

Lilly Chen, P.Eng.  
Project Engineer

Michael Cullip, P.Eng.  
General Manager

**APPENDIX A: TRAFFIC DATA**

## **APPENDIX B: OPERATIONAL ANALYSES**

**CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS**  
**Highway Capacity Manual Methodology**

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 < d \leq 15$
C	Average traffic delays	$15 < d \leq 25$
D	Long traffic delays	$25 < d \leq 35$
E	Very long traffic delays	$35 < d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

**2005 Operations**



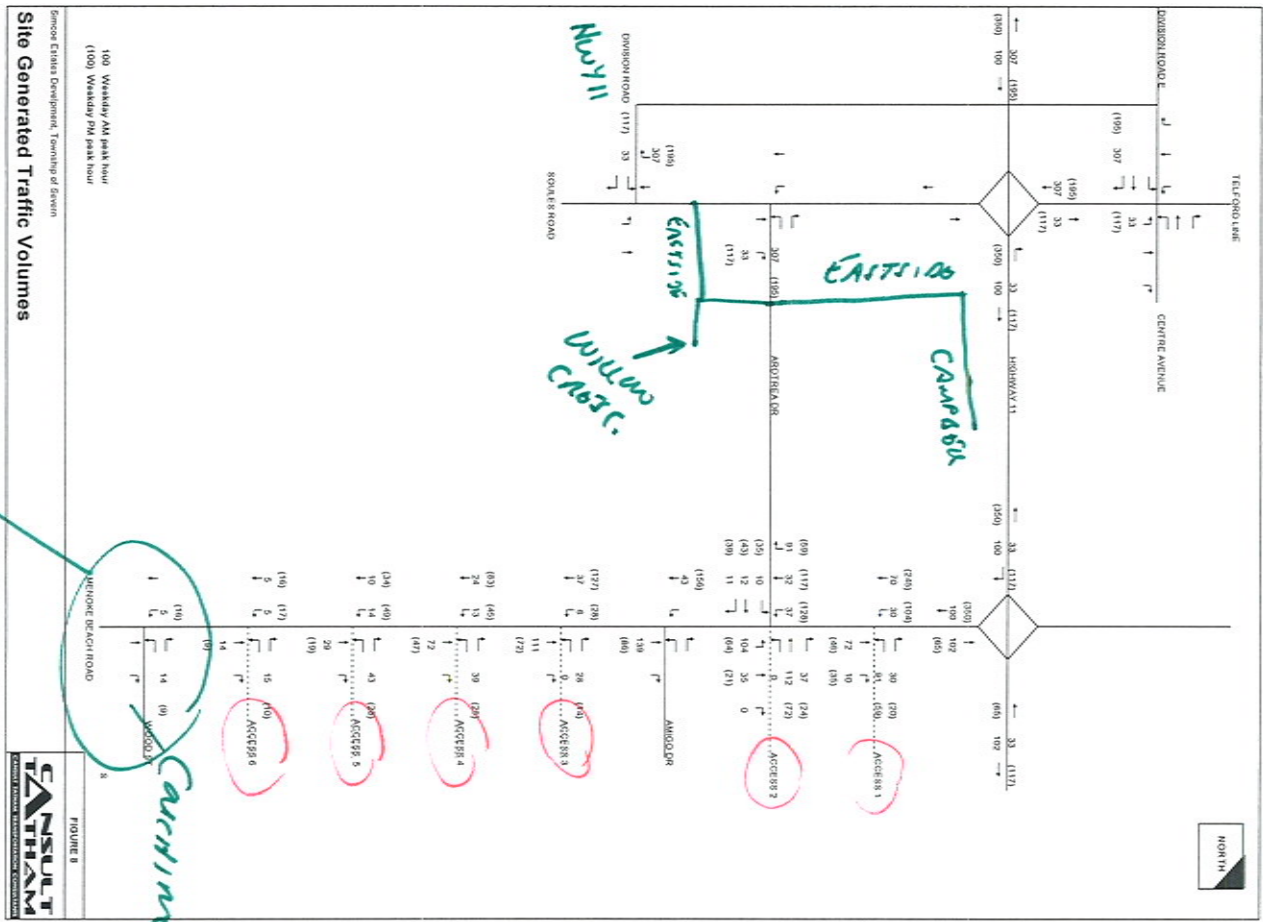
## **2010 Background Operations**

## **2015 Background Operations**

**2010 Total Operations**

**2015 Total Operations**

**APPENDIX C: LEFT TURN LANE WARRANTS**



WHY IS SITE TRAFFER ASSIGNMENTS TO THIS INTERSECTION

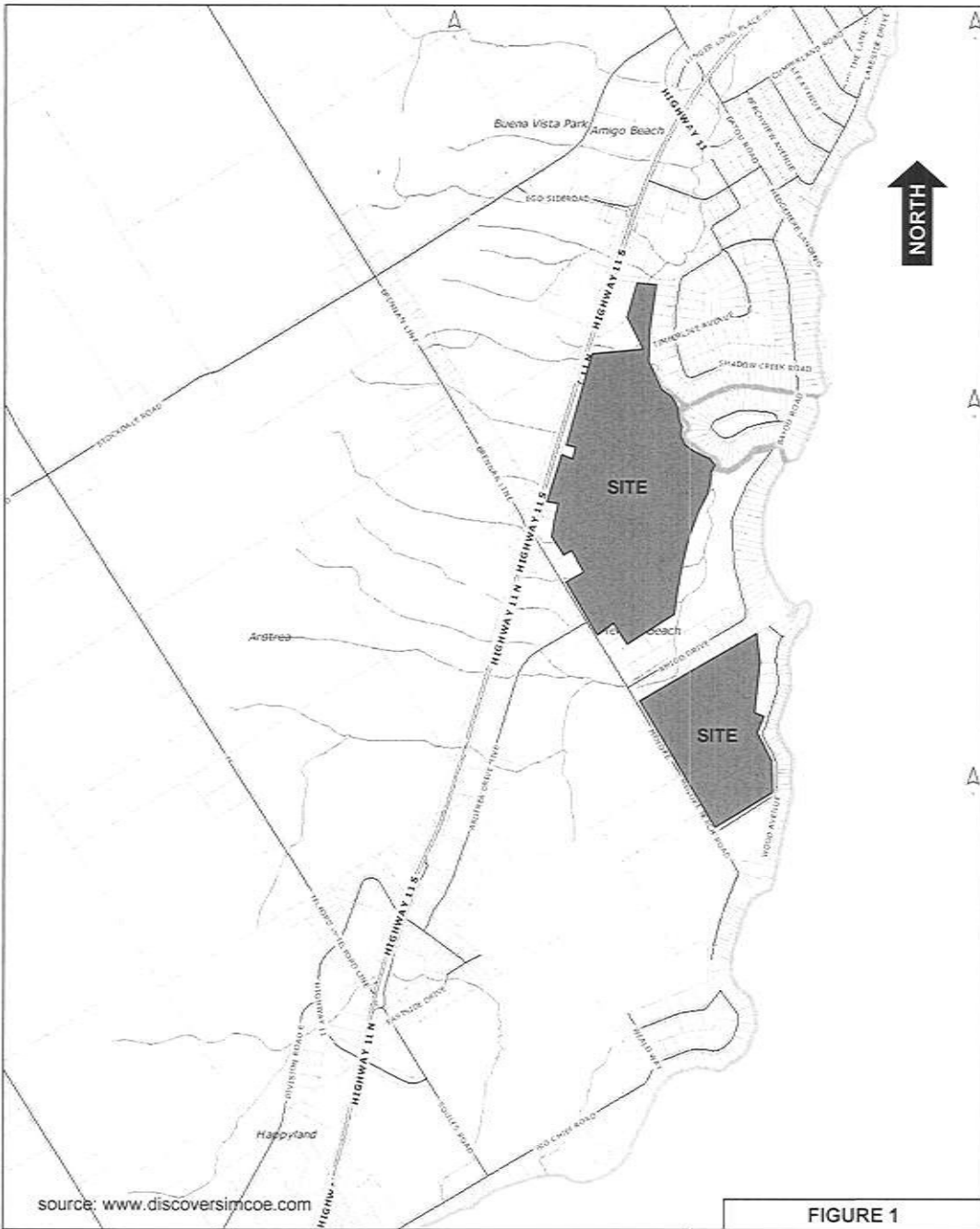


FIGURE 1



Simcoe Estates Development, Township of Severn  
**Site Location**

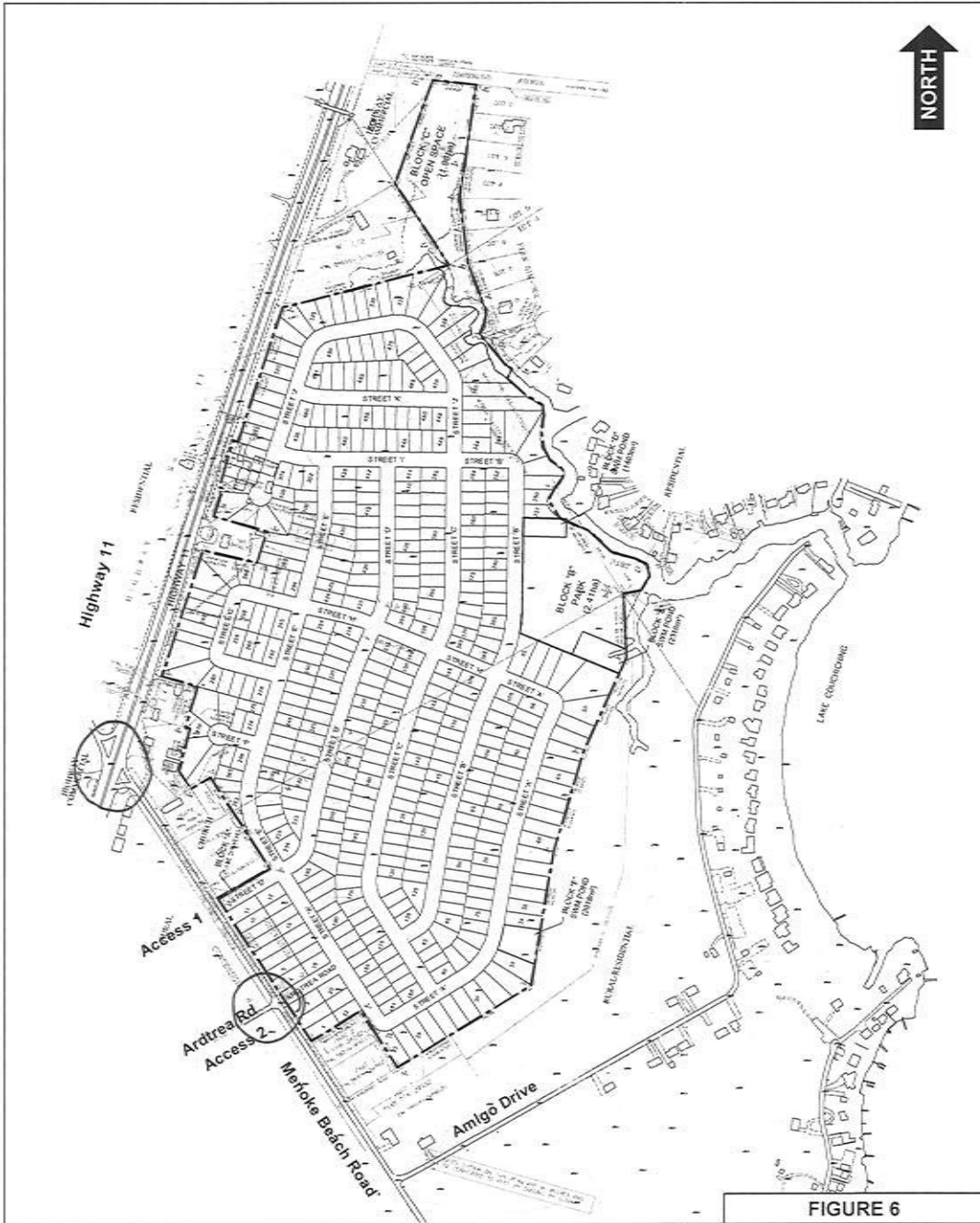


FIGURE 6

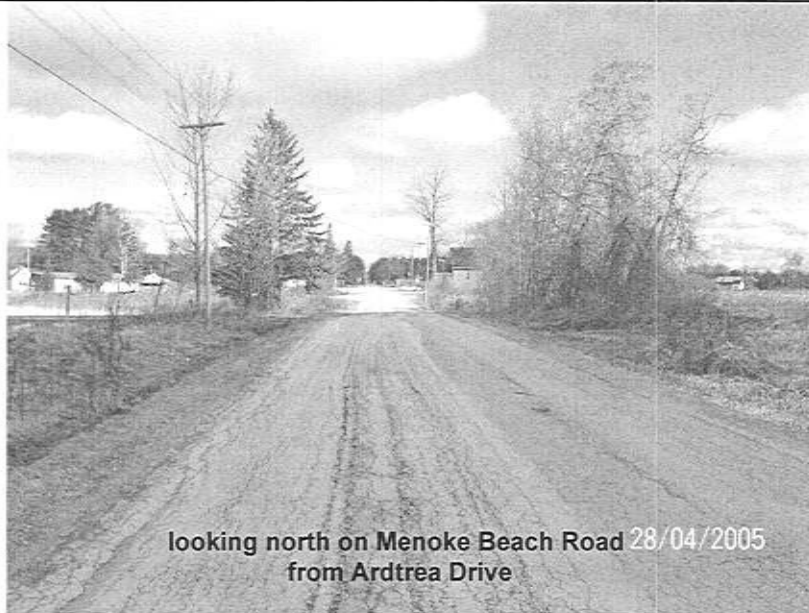
Simcoe Estates Development, Township of Severn

**Proposed Site Plan – north parcel**

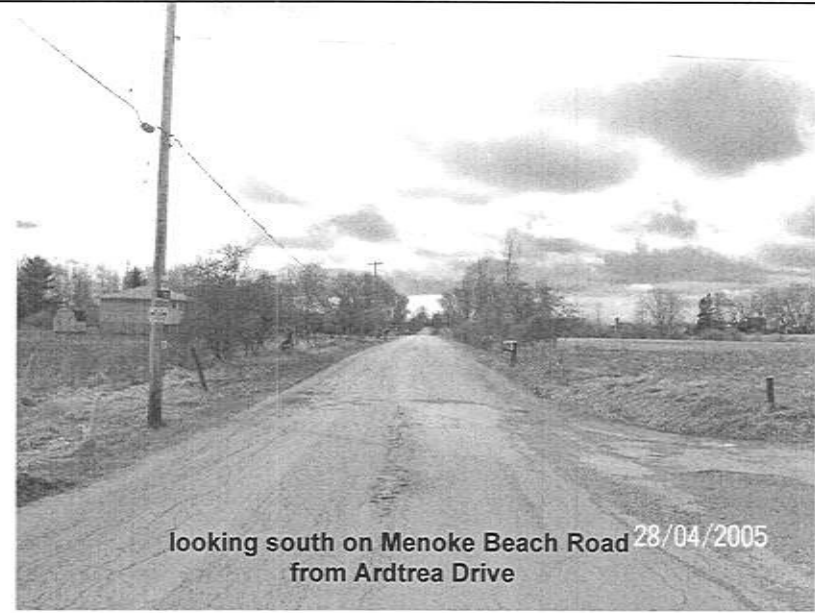




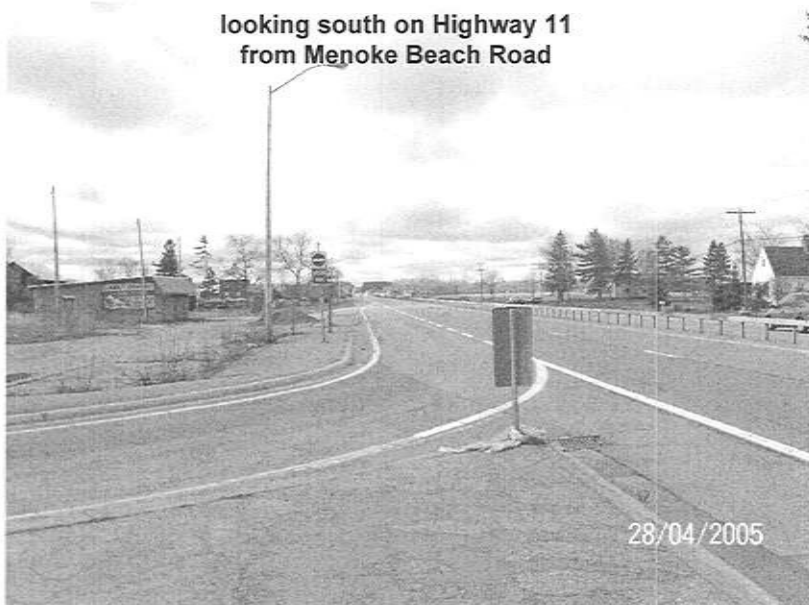




looking north on Menoke Beach Road 28/04/2005  
from Ardrea Drive

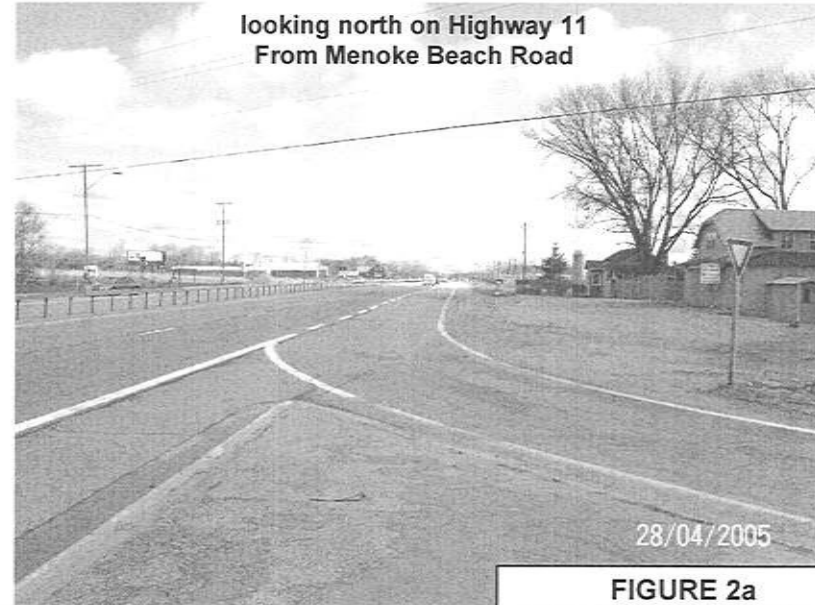


looking south on Menoke Beach Road 28/04/2005  
from Ardrea Drive



looking south on Highway 11  
from Menoke Beach Road

28/04/2005



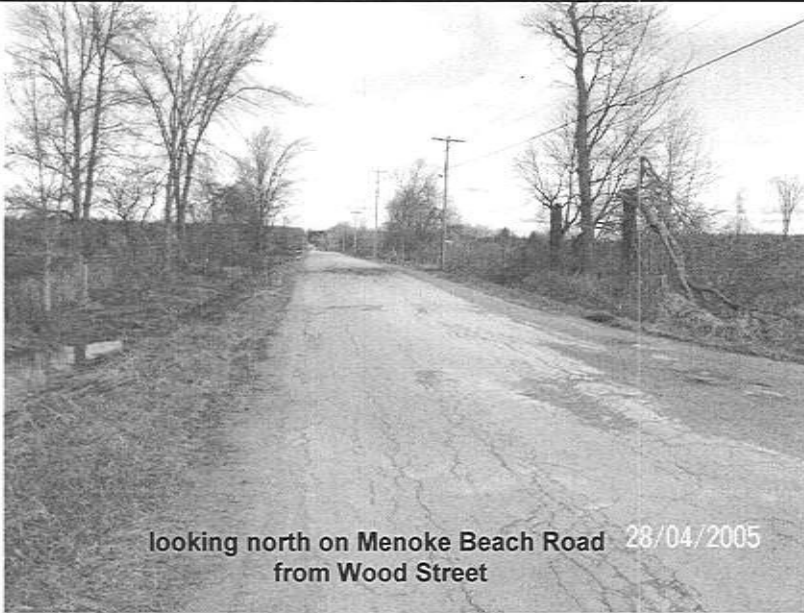
looking north on Highway 11  
From Menoke Beach Road

28/04/2005

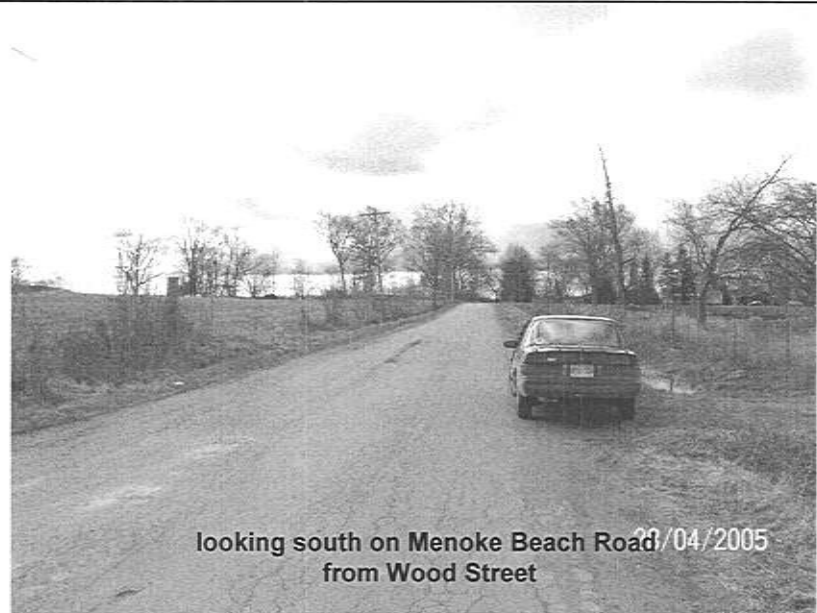
Simcoe Estates Development, Township of Severn  
**Study Area Road System**

FIGURE 2a

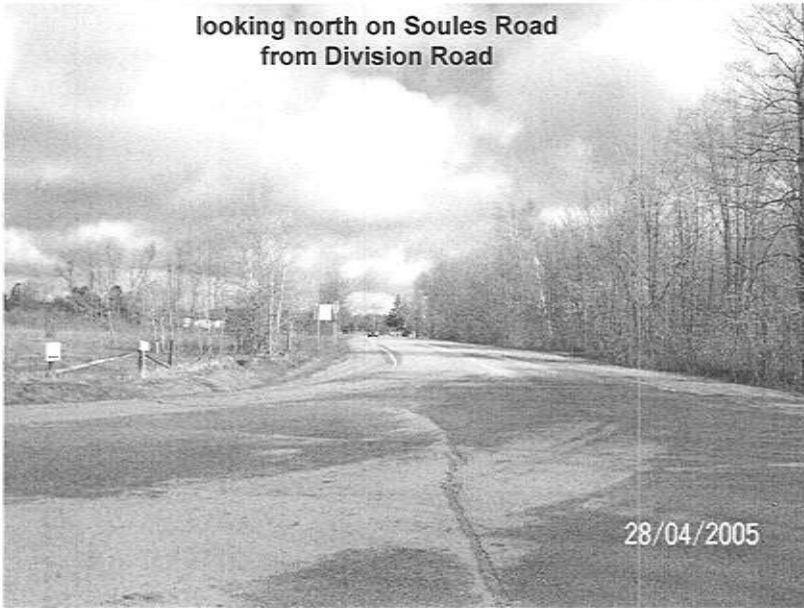
**CANSULT  
TATHAM**  
CANSULT TATHAM TRANSPORTATION CONSULTANTS



looking north on Menoko Beach Road 28/04/2005  
from Wood Street

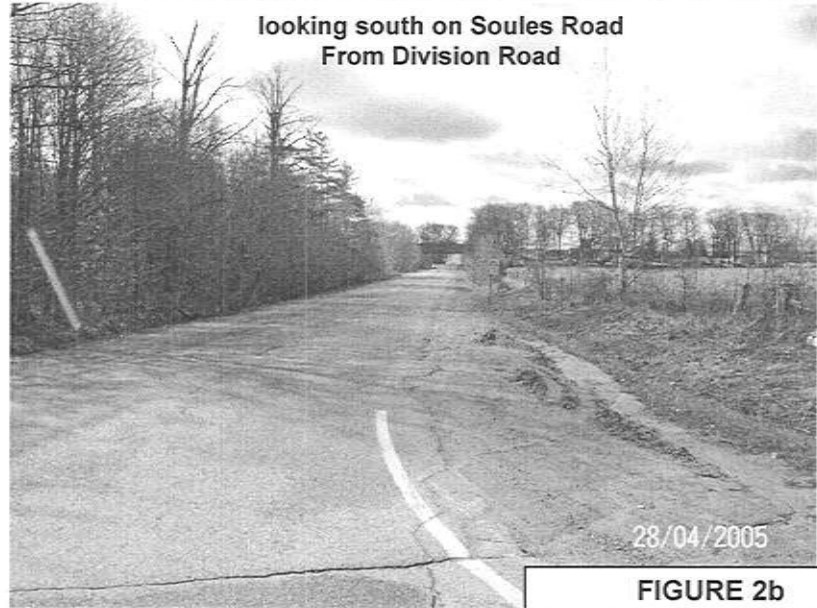


looking south on Menoko Beach Road 28/04/2005  
from Wood Street



looking north on Soules Road  
from Division Road

28/04/2005



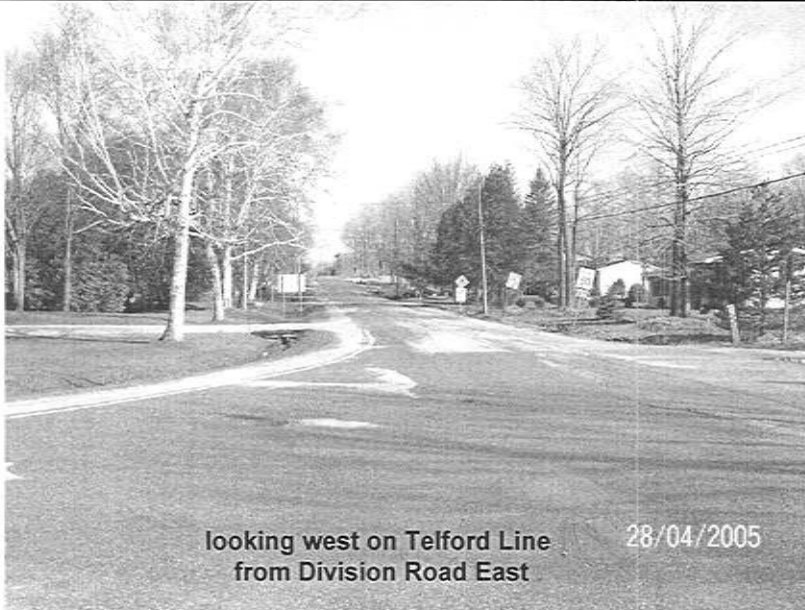
looking south on Soules Road  
From Division Road

28/04/2005

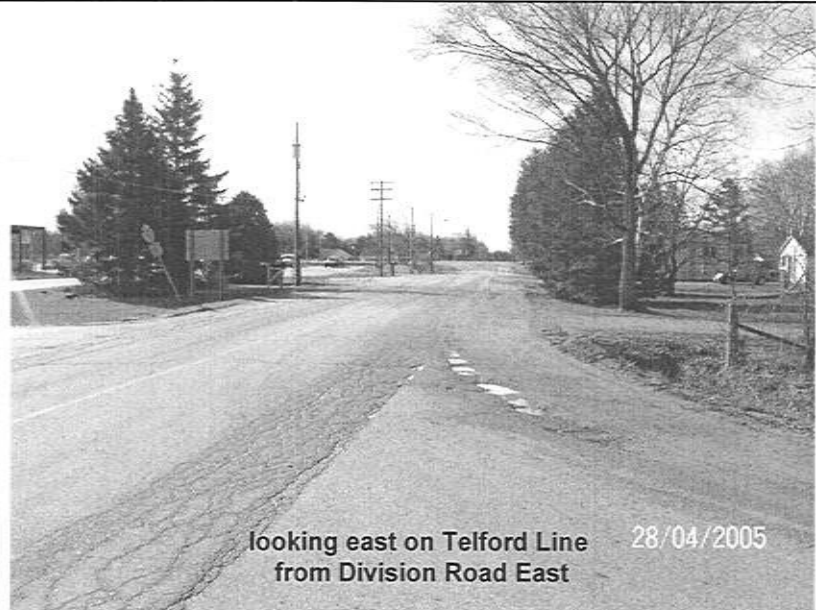
FIGURE 2b

Simcoe Estates Development, Township of Severn  
**Study Area Road System**

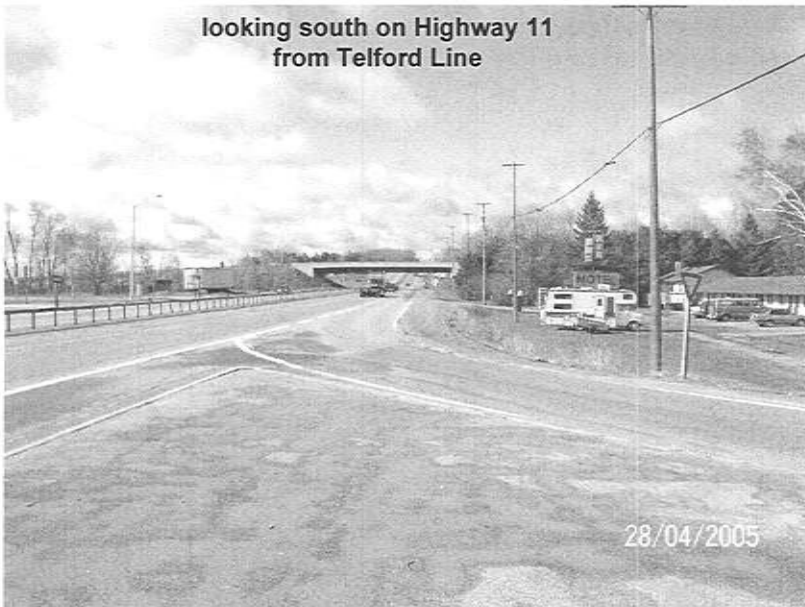
**CANSULT  
TATHAM**  
CANSULT TATHAM TRANSPORTATION CONSULTANTS



looking west on Telford Line  
from Division Road East 28/04/2005

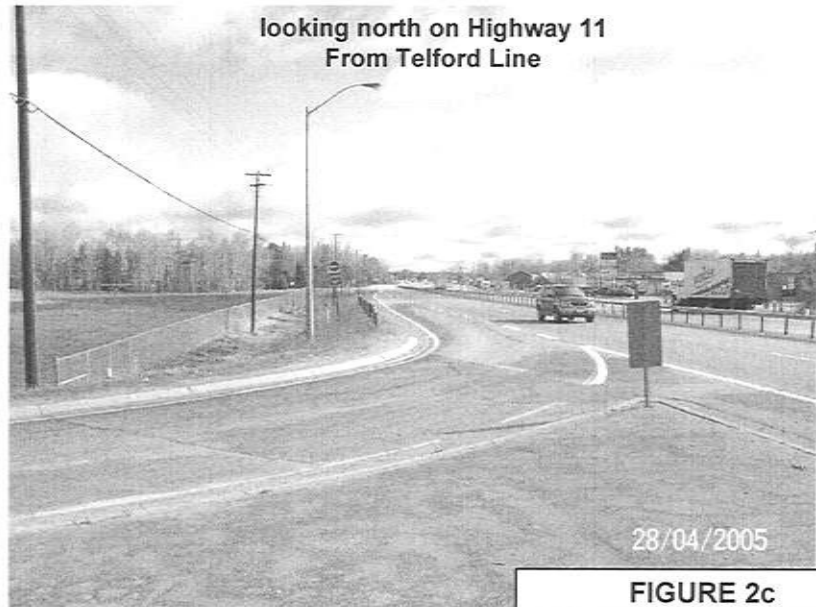


looking east on Telford Line  
from Division Road East 28/04/2005



looking south on Highway 11  
from Telford Line

28/04/2005

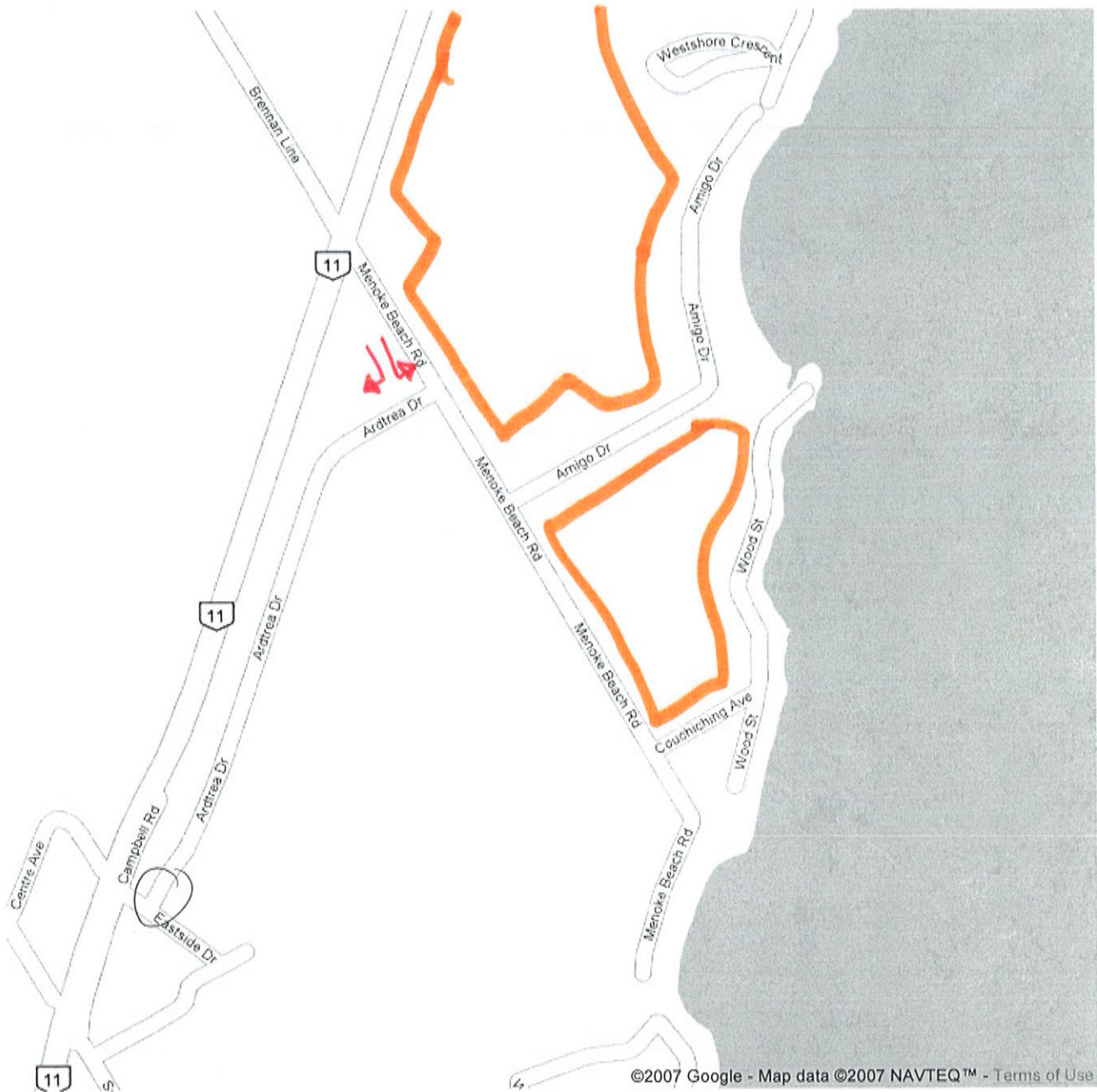


looking north on Highway 11  
From Telford Line

28/04/2005

Simcoe Estates Development, Township of Severn  
**Study Area Road System**

FIGURE 2c





Telford Line

Division Rd E

Soules Rd

Big Chief Rd

Campbell Rd

Ardrea Dr

Amigo Dr

Menoke Beach Rd

Woody

11

© 2007 Europa Technologies

© 2007 Navteq

Image © 2007 TerraMetrics

© 2007 Google™

Pointer 44°40'26.94" N 79°24'02.73" W elev 224 m Streaming ||||| 100%

Eye all 3.45 km

### County of Simcoe



Map printed on: Thu Jun 21 15:59:28 2007

0 0.1km

Disclaimer: This map is not a legal survey!.

Comments: .

Land Information Network Cooperative

### County of Simcoe



Map printed on: Thu Jun 21 15:55:27 2007

0 0.1km

Disclaimer: This map is not a legal survey!.

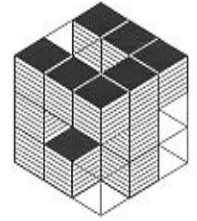
Comments: ,

Land Information Network Cooperative



# MEMO

*C. C. TATHAM & ASSOCIATES LTD.*



CT105015-1

**TO:** TC  
**FROM:** BK  
**DATE:** June 26, 2007  
**SUBJECT:** ORSI Development – TIS Peer Review

*ACTION BY*

As requested, I have completed a review of the comments provided by Robert Davies (Ainley & Associates) in his letter to the Township of Severn on December 18, 2006 concerning the Traffic Impact Assessment prepared by CTTC for Simcoe Estates Limited (dated December 2005). My response is provided below.

In summary, Mr. Davies's comments are as follows:

1. No existing conditions information provided for either Eastside Drive and Campbell Road;
2. Report figures incorrectly shows Ardrea Drive connecting directly with Soules Road;
3. Couchiching Ave mislabelled as Wood Street;
4. Amigo Street misspelled;
5. No analysis undertaken for the intersection of Eastside Drive and Soules Road
6. Planning horizons should commence at the same time as the start of housing construction;
7. Compound growth factors should be used;
8. No site traffic should be distributed to the Couchiching Ave intersection;
9. Impact of development on the Campbell Road/Soules Road and Eastside Drive/Soules Road intersections should be provided;
10. Improvements to the geometry and road cross section of the existing roads required to accommodate the additional traffic generated by the development;
11. Geotechnical investigation should be undertaken on all roads impacted by this development to determine the extent of road upgrades required.
12. Sight lines and stopping sight distances should be reviewed on Eastside Drive and at the intersection of Eastside Drive and Soules Road
13. The number of new access points on Menoke Beach Road for the south development should be reduced from 4 to 2.

I have reviewed the CTTC TIA in conjunction with the Ainley comments. My response to each of the above noted comments are as follows:

1. Agreed - existing condition information for Eastside Drive and Campbell Road should be provided;
2. Agreed – clarification that Ardrea Drive does not connect with Soules should be provided;
3. Agreed – reference to Menoke/Wood intersection should read Menoke/Couchinhing Ave;