



Lowndes Property—Traffic Impact Study

Lowndes Holdings

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August 2004



Stantec

Proposed Dolostone Quarry, Lowndes Holdings Corp. Traffic Impact Study



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Executive Summary

INTRODUCTION

Stantec was retained to undertake a traffic impact study (TIS) for the Proposed Dolostone Quarry, Lowndes Holdings Corp., City of Hamilton. The property is located on the north side of 11th Concession East, between Centre Road and Milborough Line, in the former Town of Flamborough, now the City of Hamilton. Lowndes Holdings Corp. identified a Provincially significant Amabel dolostone deposit, approximately 34 m thick and is proposing to produce up to 3 million tonnes per year.

The purpose of this Traffic Impact Study is to:

- Review the existing transportation network in the vicinity of the site
- Develop traffic forecasts for the aggregate operation
- Examine the potential accesses and haul routes to service the site
- Determine the impact of the traffic generated by the site on the roadways used as the haul route

EXISTING TRANSPORTATION NETWORK AND POTENTIAL HAUL ROUTES

The Proposed Dolostone Quarry does not have direct access to designated truck routes, however, the nearest truck routes are 2 to 5 km away depending on the potential access developed, including Centre Road and Campbellville Road. These roadways have reduced load restrictions that apply March 1 to April 30 (5 tonnes per axle).

The following roadways provide potential truck routes from near the Proposed Dolostone Quarry to Highway 401 at the Guelph Line interchange located near Campbellville to the east and to Highway 6 to the west:

- **Guelph Line** is under the jurisdiction of the Region of Halton (Regional Road 1) from just north of the QEW to the northern boundary of the Region and is functionally classified as a Major Arterial. It provides the nearest interchange for Highway 401 to the Proposed Dolostone Quarry, approximately 8 km to the east
- **Reid Sideroad** and **Twiss Road** are two-lane wide, rural roadways under the jurisdiction of the Town of Milton and are functionally classified as Local. They provide an alternative route to using Campbellville Road and Guelph Line through the community of Campbellville to access the interchange at Highway 401 and Guelph Line. Reid Sideroad is stop controlled at Twiss Road (T-intersection with no exit on the north leg). The posted speed

on Reid Sideroad is 60 km/h near Guelph Line and 80 km/h near Twiss Road. Twiss Road is posted with a load restriction of a maximum of 5 tonnes per axle southbound. No time frame restrictions are provided on the sign however the roadway is used by heavy trucks accessing the adjacent industrial uses. Twiss Road is stop controlled at the intersection with Campbellville Road (cross intersection). There are three railway tracks that cross Twiss Road just north of Campbellville road and the crossing is controlled by gates and flashers.

- **Campbellville Road** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton west of Milborough Line, and the Town of Milton east of Milborough Line. In the City of Hamilton it is a designated truck route and is a designated reduced loads roadway with a posted load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. In the Town of Milton it is functionally classified as a Minor Arterial. It is posted with a load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. The posted speed varies from 60 to 80 km/h. Campbellville Road provides access easterly to Highway 401 via Twiss Road and Guelph Line and to westerly to Highway 6.
- **Centre Road** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton. It is a designated truck route south of Campbellville Road and is a designated reduced loads roadway with a posted load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. The posted speed on Centre Road north of 11th Concession East is 80 km/h with a speed reduction zone posted at 60 km/h at the community of Mountsberg. It is stop controlled at the intersection of Campbellville Road (cross intersection)

TRAFFIC FORECASTS AND TRAFFIC OPERATIONAL IMPACTS

The annual tonnage that Lowndes Holdings Corp. is proposing to extract is 3 million tones. The extraction is expected to operate 200 days a year at an average of 15,000 tonnes per day. At times this average may be exceed by 25% resulting in an average maximum of 18,750 tonnes per day.

The summary of truck sizes, numbers and tonnes shipped per day for an average maximum day is provided in Table 1.

Table 1
Summary of Trucks Generated on an Average Maximum Day to
Ship 3 Million Tonnes Annually

Truck Size	Truck Mix	No. of Trucks per Average Maximum Day	No. of Tonnes Shipped during Average Maximum Day by Truck Type
40 tonnes	29%	166	6,643 tonnes
35 tonnes	41%	235	8,218 tonnes
23 tonnes	29%	166	3,820 tonnes
12 tonnes	1%	6	69 tonnes
Weighted Average: 32.7 tonnes	Total:	573 trucks	18,750 tonnes

During an average maximum day, that is when production exceeds the average daily production by 25%, it is estimated that there would be approximately 570 trucks loads shipped. That is equivalent to 570 empty trucks entering the Proposed Dolostone Quarry and 570 loaded trucks exiting the Proposed Dolostone Quarry. During the AM peak hour, the Proposed Dolostone Quarry is estimated to generate 70 trucks entering and 70 trucks exiting, and during the PM peak hour it is estimated to generate 60 trucks entering and 60 trucks exiting.

All of the key unsignalized intersections along the potential haul routes will operate at an acceptable level of service C or better with less than 25 sec/veh of delay over the next 10 years during the AM and PM peak hours with the addition of the traffic generated by the quarry.

POTENTIAL ACCESS LOCATIONS

Three potential access locations were investigated in the field: 11th Concession East, Milborough Line and 12th Concession East as follows:

- On 11th Concession East, the access can be located from the existing westerly access easterly for 190 m and meet sight distance criteria.
- On Milborough Line, the access is located at an existing entrance 480 m north of 11th Concession East. The sight distance to the south on Milborough Line is deficient but can be corrected by lowering a hill located approximately 250 north of 11th Concession East by about one metre.
- On 12th Concession East, the roadway terminates at the access to the Bronte Creek Estates subdivision. It was assumed that an access to 12th Concession East would intersect at the existing termination achieving sight distance into Bronte Creek Estates, a local residential road with low operating speeds.

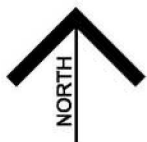
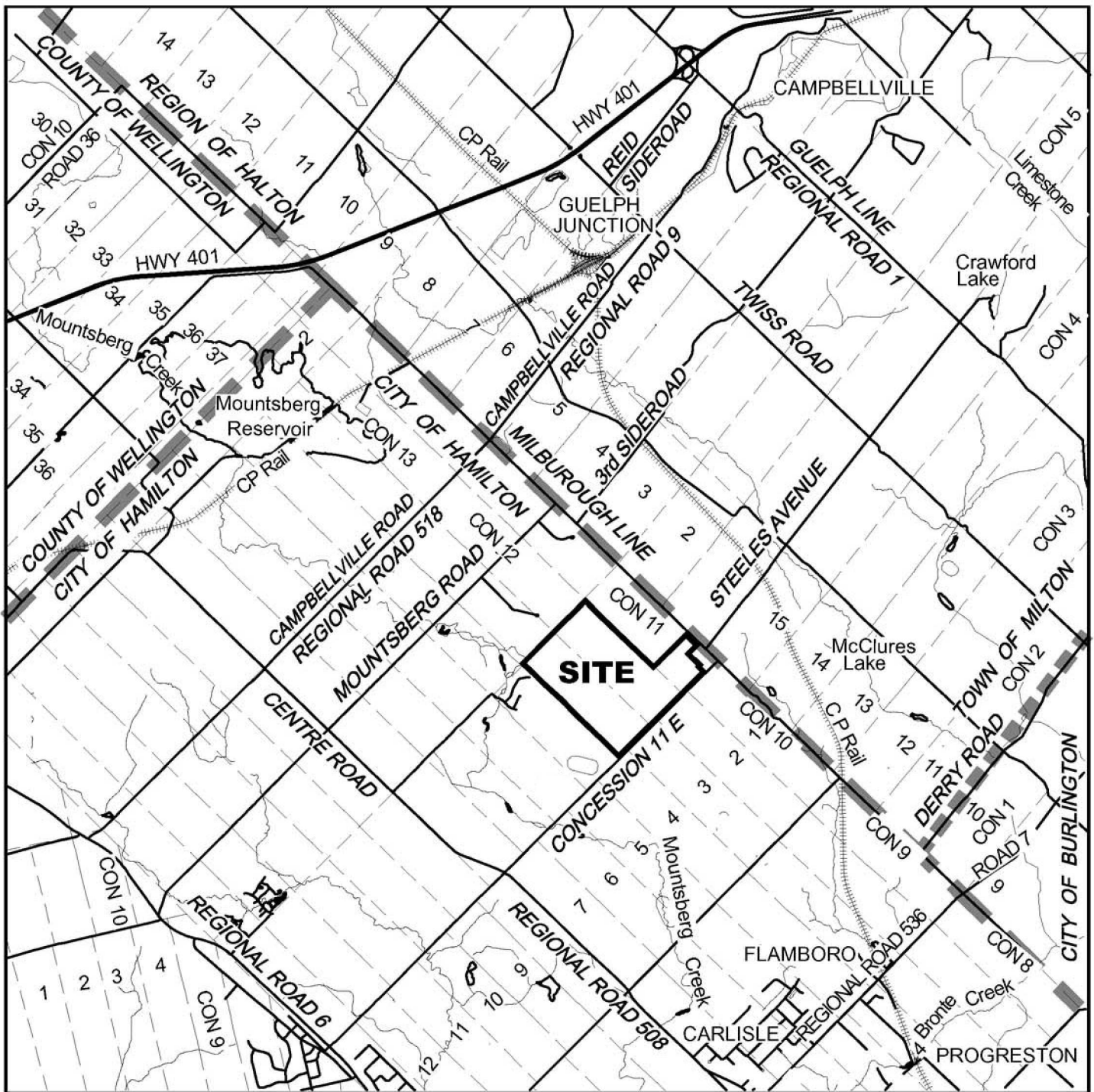
All sight distance criteria require verification in the field once a preferred final location is identified.

A summary of the traffic issues associated with each potential access is provided in Table 2.

Table 2
Summary of Potential Access Issues

Access Option:	11th Concession East	Milborough Line	12th Concession East
<i>Potential access location based on sight distance criteria</i>	<ul style="list-style-type: none"> ▪ From the existing westerly access easterly for 180 m 	<ul style="list-style-type: none"> ▪ 480 m north of 11th Concession East. Requires lowering a hill located approximately 250 m north of 11th Concession East by about one meter 	<ul style="list-style-type: none"> ▪ At the termination of 12th Concession East at Bronte Creek Estates ▪ Note that sight distance at the intersection of 12th Concession East and Centre Road is limited
<i>Ownership</i>	<ul style="list-style-type: none"> ▪ South boundary of property at existing entrance 	<ul style="list-style-type: none"> ▪ East boundary of property at existing entrance 	<ul style="list-style-type: none"> ▪ Unopened road allowance subject to the Municipal Act to open or purchase
<i>Roadway alignment and grade</i>	<ul style="list-style-type: none"> ▪ Relatively straight horizontal alignment with some vertical curves that restrict sight distance ▪ Relatively steep grade west of property 	<ul style="list-style-type: none"> ▪ Relatively straight horizontal alignment with curvilinear alignment near 3 Side Road with some vertical curves that restrict sight distance 	<ul style="list-style-type: none"> ▪ Relatively straight horizontal alignment with some vertical curves that restrict sight distance ▪ Steep grade east of Centre Road
<i>Potential roadway improvements</i>	<ul style="list-style-type: none"> ▪ Pavement upgrading and shoulder upgrading and widening ▪ Widening of the Mountsberg Creek narrow structure if the haul route is to Centre Road 	<ul style="list-style-type: none"> ▪ Pavement upgrading and shoulder upgrading and widening ▪ Grade reduction by about 1 m of hill obscuring sight distance to the south 	<ul style="list-style-type: none"> ▪ Pavement upgrading and shoulder upgrading and widening ▪ Grade reduction/reconstruction approaching Centre Road
<i>Roadway jurisdiction and designations</i>	<ul style="list-style-type: none"> ▪ City of Hamilton: not designated as a truck route, designated a reduced loads roadway and has a posted March 1 to April 30 load restriction (5 tonnes per axle) 	<ul style="list-style-type: none"> ▪ Boundary road under joint jurisdiction ▪ Town of Milton: collector road with no access control ▪ City of Hamilton: not designated as a truck route, and designated a reduced loads roadway 	<ul style="list-style-type: none"> ▪ City of Hamilton: not designated as a truck route, and designated a reduced loads roadway
<i>Proximity to nearest truck route</i>	<ul style="list-style-type: none"> ▪ Centre Road at approximately 2 km to the west ▪ Campbellville Road via Milborough Line at approximately 5 km to the east and north 	<ul style="list-style-type: none"> ▪ Campbellville Road at approximately 3 km to the north 	<ul style="list-style-type: none"> ▪ Campbellville Road at approximately 2 km to the north

All roadways on which the potential accesses are located may require pavement upgrading and shoulder widening and upgrading. The Milborough Line access would require reducing the grade of a hill by about one metre to achieve sight distance to and from the south. All of them are designated reduced loads roadways. 11th Concession East has a narrow structure over



Site Location

Scale: 1 : 60,000

Figure 1.1

2.0 Context

2.1 POTENTIAL ACCESSES

2.2 EXISTING ROAD NETWORK

Roadways in the vicinity of the Proposed Dolostone Quarry onto which access may be provided are described below.

- **11th Concession East** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton. It is not a designated truck route and is a designated reduced loads roadway with a posted load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. The posted speed is 60 km/h. It is stop controlled at the intersections with Milborough Line (T intersection) and Centre Road (cross intersection). There is a narrow bridge crossing of Mountsberg Creek just west of the Proposed Dolostone Quarry. 11th Concession East runs generally east-west and forms the southern boundary to the property
- **Milborough Line** is a two-lane wide, rural roadway under the assumed joint jurisdiction of the City of Hamilton and the Town of Milton (Municipal Act 2001). It is not a designated truck route and is a designated reduced loads roadway but no load restriction is posted. Milborough Line is functional classified as a Collector. The posted speed is 60 km/h. It is stop controlled at the intersection with Campbellville Road (cross intersection). Milborough Line runs generally north-south parallel to the east side of the Proposed Dolostone Quarry approximately 500 m to the east
- **12th Concession East** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton. It is not a designated truck route and is a designated reduced loads roadway but no load restriction is posted. The posted speed is 60 km/h and it is signed no exit west of Centre Road. It is stop controlled at the intersection with Centre Road (T intersection). 12th Concession East runs generally east-west and terminates approximately 400 m west of the Proposed Dolostone Quarry at a rural residential estate subdivision (Bronte Creek Estates). However, an unopened road allowance continues easterly to Milborough Line forming the northern boundary of the Proposed Dolostone Quarry

The following roadways provide potential truck routes from near the Proposed Dolostone Quarry to Highway 401 at the Guelph Line interchange located near Campbellville to the east and to Highway 6 to the west:

- **Guelph Line** is under the jurisdiction of the Region of Halton (Regional Road 1) from just north of the QEW to the northern boundary of the Region and is functionally classified as a Major Arterial. It provides the nearest interchange for Highway 401 to the Proposed Dolostone Quarry, approximately 8 km to the east

- **Reid Sideroad** and **Twiss Road** are two-lane wide, rural roadways under the jurisdiction of the Town of Milton and are functionally classified as Local. They provide an alternative route to using Campbellville Road and Guelph Line through the community of Campbellville to access the interchange at Highway 401 and Guelph Line. Reid Sideroad is stop controlled at Twiss Road (T-intersection with no exit on the north leg). The posted speed on Reid Sideroad is 60 km/h near Guelph Line and 80 km/h near Twiss Road. Twiss Road is posted with a load restriction of a maximum of 5 tonnes per axle southbound. No time frame restrictions are provided on the sign however the roadway is used by heavy trucks accessing the adjacent industrial uses. Twiss Road is stop controlled at the intersection with Campbellville Road (cross intersection). There are three railway tracks that cross Twiss Road just north of Campbellville road and the crossing is controlled by gates and flashers.

- **Campbellville Road** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton west of Milborough Line, and the Town of Milton east of Milborough Line. In the City of Hamilton it is a designated truck route and is a designated reduced loads roadway with a posted load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. In the Town of Milton it is functionally classified as a Minor Arterial. It is posted with a load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. The posted speed varies from 60 to 80 km/h. Campbellville Road provides access easterly to Highway 401 via Twiss Road and Guelph Line and to westerly to Highway 6.

- **Centre Road** is a two-lane wide, rural roadway under the jurisdiction of the City of Hamilton. It is a designated truck route south of Campbellville Road and is a designated reduced loads roadway with a posted load restriction of a maximum of 5 tonnes per axle from March 1 to April 30. The posted speed on Centre Road north of 11th Concession East is 80 km/h with a speed reduction zone posted at 60 km/h at the community of Mountsberg. It is stop controlled at the intersection of Campbellville Road (cross intersection)

2.3 OFFICIAL PLAN TRANSPORTATION DESIGNATIONS

2.3.1 City of Hamilton

The City of Hamilton is in the process of consolidating and updating the Official Plans of the former Region of Hamilton-Wentworth and former cities and towns within the Region, including the Town of Flamborough. Roadway classifications and functions will be reviewed as part of this process. In the meantime, the new City of Hamilton's truck route designations is used in this study to determine the access and serviceability of the Proposed Dolostone Quarry by the area roadway network. The truck route and restricted load roadways maps were obtained from www.hamilton.ca (2003) and are illustrated on Figure 2.1 and Figure 2.2.

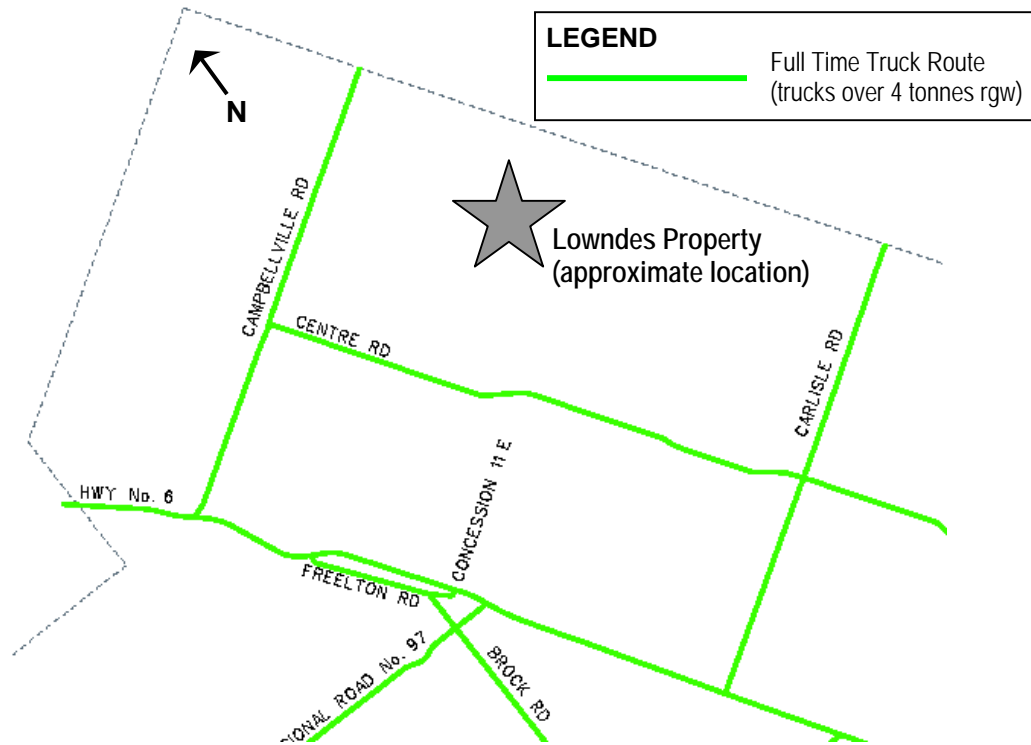


Figure 2.1

Highways Designated for Use by Heavy Traffic in the City of Hamilton near the Proposed Dolostone Quarry (source: www.hamilton.ca, 2003)

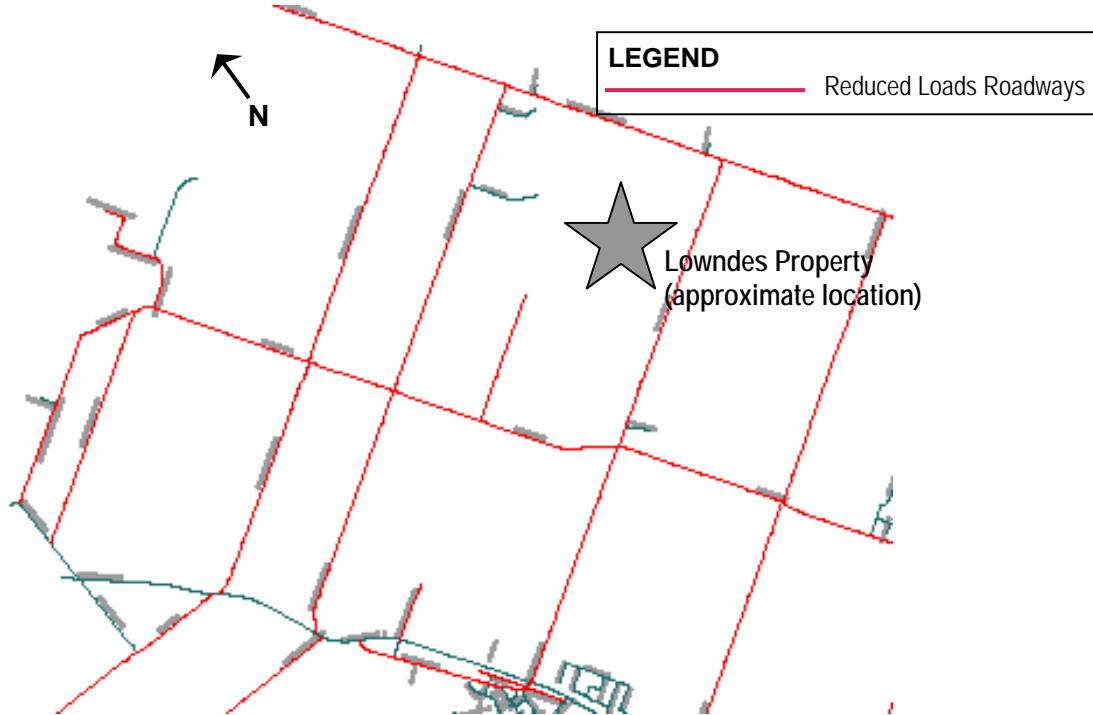


Figure 2.2

Reduced Loads Roadways 2003 in the City of Hamilton near the Proposed Dolostone Quarry
(source: www.hamilton.ca, 2003)

2.3.2 Region of Halton and Town of Milton

As of January 1, 2004 all Major Arterials roads within the Regional Municipality of Halton have been transferred to Regional jurisdiction and Multi-Purpose and Minor Arterial to local municipal jurisdiction. The transfer implements the rationalization of the Regions roadway as approved by Regional Council on August 13, 2003, through Report CA-31-03 (Town of Milton Draft OPA 18, October 2003 and Region of Halton Proposed OPA 23, December 2003).

The definitions of those facility types that are in the vicinity of the Proposed Dolostone Quarry are as follows:

- **Major Arterials** function to serve mainly inter-regional and regional traffic demands. They accommodate truck traffic and high-order transit services and HOV lanes. They connect urban areas or nodes in different municipalities. They carry high volumes of traffic and distribute traffic to and from the Provincial Freeways and Highways. General design guidelines include a high degree of access control, encourage transit-supportive land uses along the right-of-way within urban areas, and right-of-way requirements up to 50 m in width
- **Minor Arterials** function to serve mainly local traffic demands. They accommodate truck traffic and local transit services. They connect urban areas or nodes within the same municipalities. They carry moderate to high volumes of traffic and distribute traffic to and

from Major Arterials. General design guidelines include an intermediate degree of access control, and right-of-way requirements up to 35 m in width

- **Collector Roads** serve local traffic demands. They accommodate local transit service and connect Collector and Local Roads to Arterials. General design guidelines include no access control, up to four travel lanes, provision for on-street parking on one or two sides, and right-of-way requirements up to 26 m in width
- **Local Roads** serve residential neighbourhoods or employment area travel demands. They connect individual properties to Collectors and Arterials. General design guidelines include no access control, two travel lanes, and right-of-way requirements up to 20 m in width

The Town of Milton OPA 18 transportation is illustrated on Figure 2.3. The Region of Halton Proposed OPA 23 functional plan of major transportation facilities is illustrated on Figure 2.4.

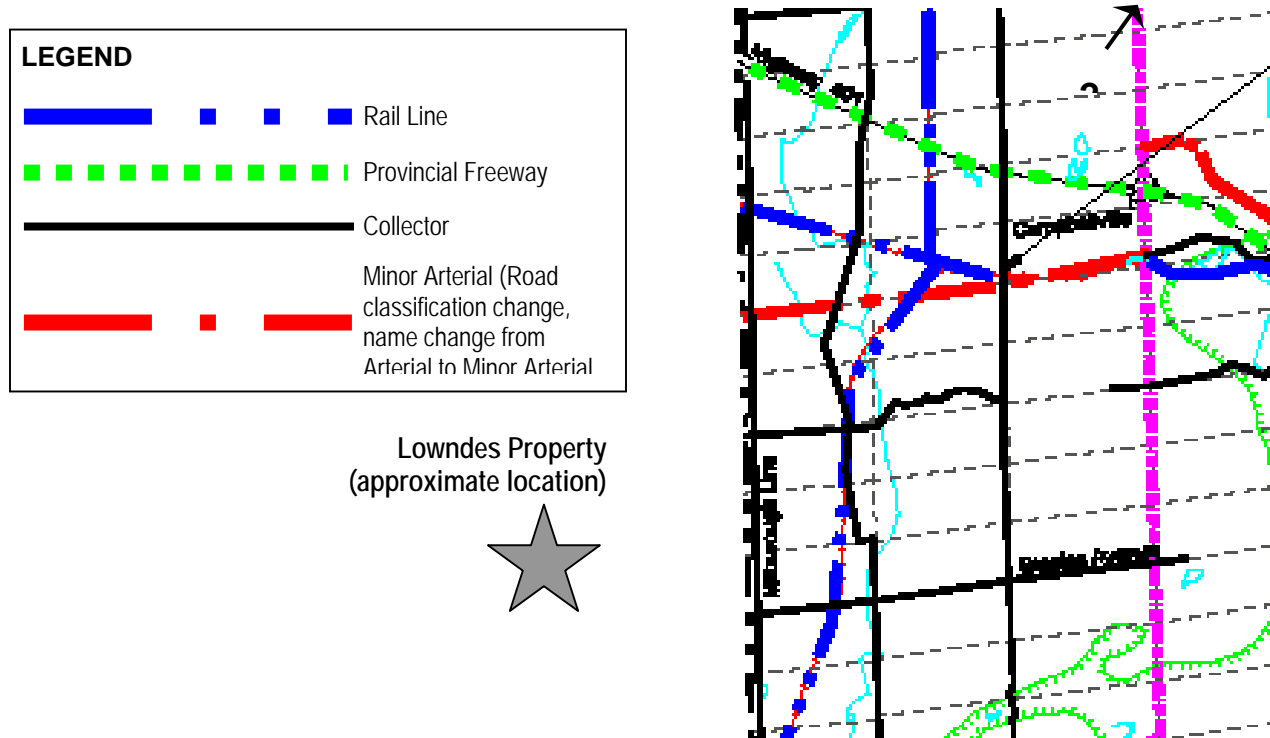
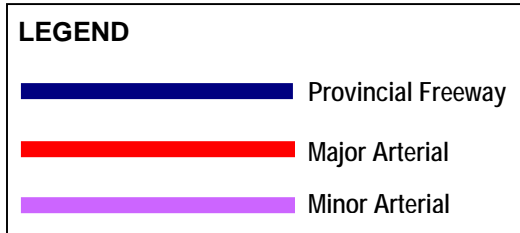


Figure 2.3
Town of Milton Official Plan Schedule C—Transportation Plan
(source: Draft OPA 18, October 2003)



Lowndes Property
(approximate location)



Figure 2.4
Region of Halton Map 3 Functional Plan of Major Transportation Facilities
(source: Proposed OPA 23, December 2003)

3.0 Travel Demand

3.1 HORIZON YEAR OF STUDY

The aggregate operation is anticipated to be operating for a number of years. It will likely be more than 5 years before the annual maximum tonnage of 3 million is reached. Therefore, the horizon year 2014, in ten years, was selected as the horizon year for evaluating traffic impacts.

3.2 TIME PERIODS OF ANALYSIS

The weekday AM and PM peak hours carry the peak hourly traffic volumes on the adjacent roadways. The Shipping hours are proposed from 6 AM to 6 PM for 12 hours. Generally, based on aggregate operations elsewhere in southern Ontario, 12% of the shipping traffic travels during the AM peak hour and 10% during the PM peak hour. The AM and PM peak hours of the adjacent roadways were selected as the time periods for evaluating traffic impacts.

3.3 EXISTING TRAFFIC VOLUMES

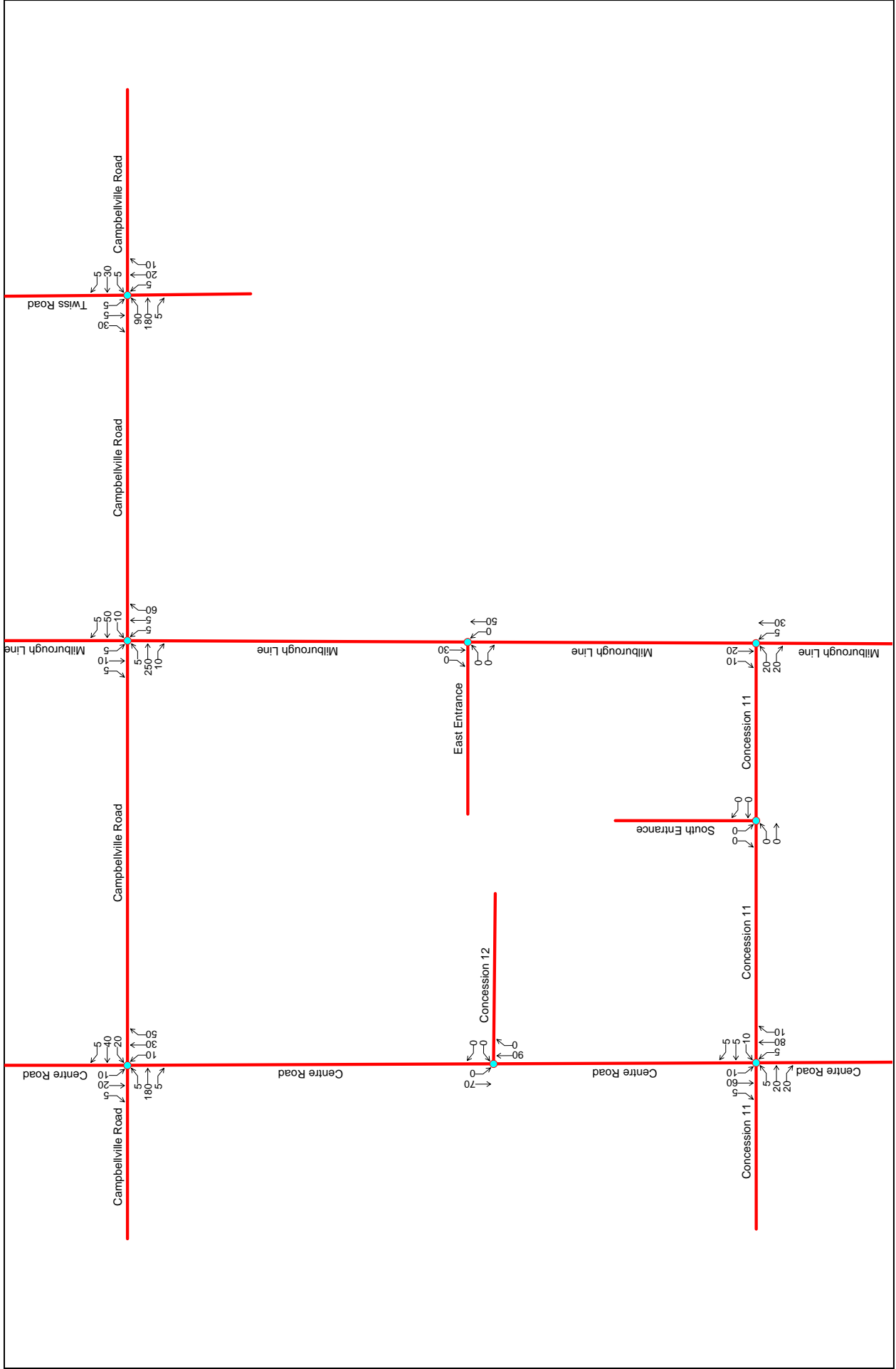
Traffic counts were undertaken at the following key intersections along the proposed haul routes:

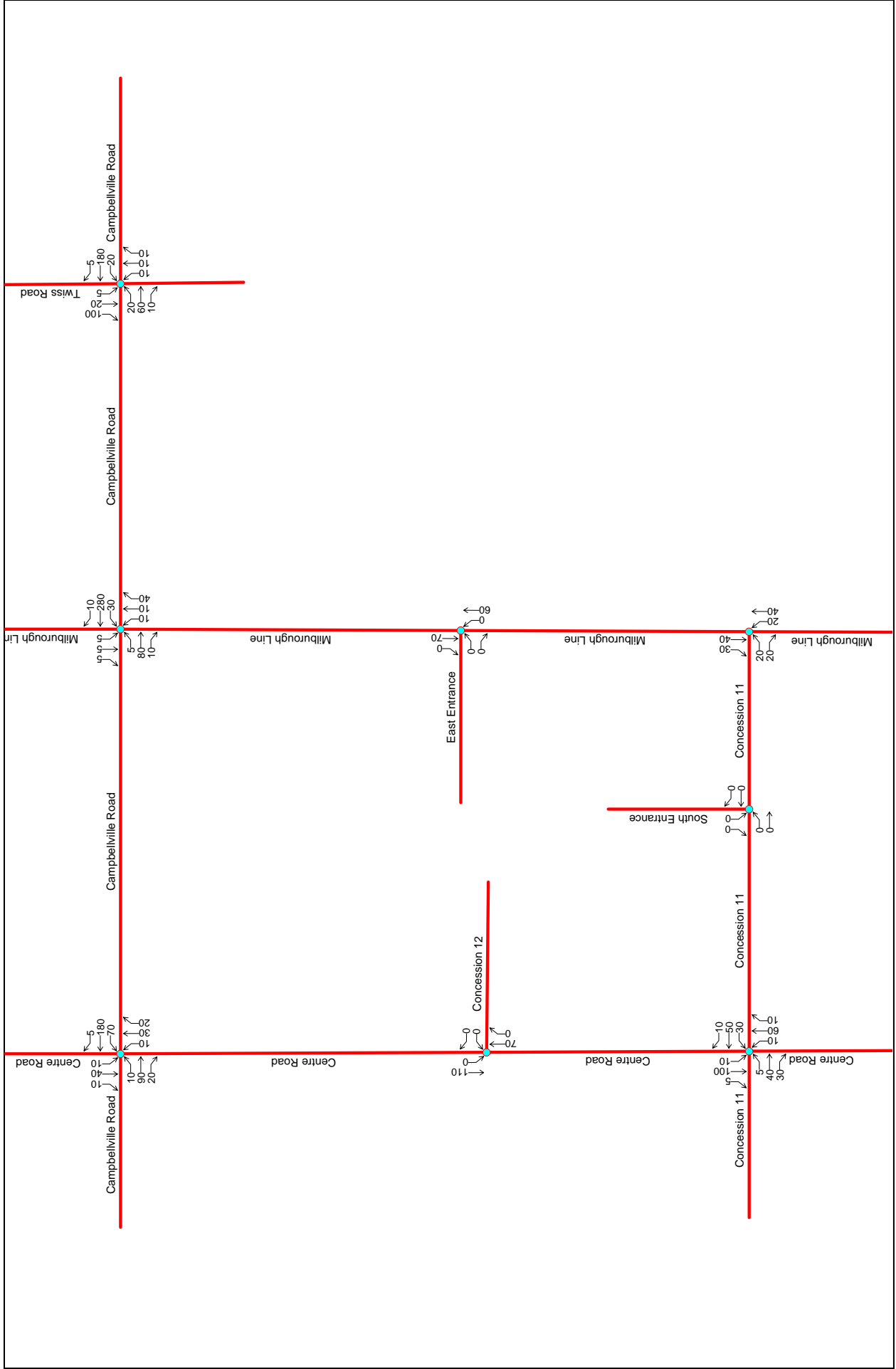
- Campbellville Road at Milborough Line, Tuesday, October 28, 2003
- Campbellville Road at Twiss Road, Tuesday, October 28, 2003
- Milborough Line at 11th Concession, Tuesday, June 1, 2004
- Centre Road at 11th Concession, Wednesday, June 2, 2004
- Centre Road at Campbellville Road, Thursday, June 3, 2004

The existing traffic volumes are illustrated on Figure 3.1.

Twiss Road north of Campbellville Road currently carries approximately 160 vph during the AM and PM peak hours, and 820 during the 8-hour period for an Average Annual Daily Traffic (AADT) volume of approximately 1,600 vpd. During the AM peak hour there were 15 trucks (10%), during the PM peak hour there were 4 trucks (3%), and during the 8-hour period there were 60 trucks (8%). These volumes are well within the capacity of a two-lane rural roadway (400 to 500 vph) and are appropriate for a Local functional classification.

Milborough Line south of Campbellville Road currently carries approximately 80 vph during the AM and PM peak hours, and 460 during the 8-hour period for an AADT volume of approximately 900 vpd. During the AM peak hour there were ten trucks (13%), during the PM peak hour there





were two trucks (2%), and during the 8-hour period there were 45 trucks (10%). These volumes are well within the capacity of a two-lane rural roadway (400 to 900 vph) and are appropriate for a Collector functional classification.

Campbellville Road from Milborough Line to Twiss Road currently carries approximately 260 to 330 vph during the AM peak hour, and 330 to 370 vph during the PM peak hour. The 8-hour count is 1,590 to 2,050 vehicles for an AADT volume of approximately 3,200 to 4,100 vpd. The volume of trucks varies from 17 to 24 vph during the AM peak hour, and 14 to 18 vph during the PM peak hour. During the 8-hour count there were approximately 110 to 140 trucks (7%). These volumes are well within the capacity of a two-lane rural roadway (500 to 900 vph) and are appropriate for a Minor Arterial functional classification.

Centre Road from 11th Concession to Campbellville Road currently carries approximately 130 to 160 vph during the AM peak hour, and 180 to 190 vph during the PM peak hour. The 8-hour count is 890 to 1,020 vehicles for an AADT volume of approximately 1,800 to 2,000 vpd. The volume of trucks varies from 10 to 18 vph during the AM peak hour, and from 8 to 10 vph during the PM peak hour. During the 8-hour count there were approximately 70 to 80 trucks (8%). These volumes are well within the capacity of a two-lane rural roadway (500 to 900 vph).

11th Concession from Centre Road to Milborough Line currently carries approximately 50 vph during the AM peak hour, and 90 to 150 vph during the PM peak hour. The 8-hour count is 360 to 500 vehicles for an AADT volume of approximately 700 to 1,000 vpd. The volume of trucks is 5 vph during the AM peak hour, and from up to 2 vph during the PM peak hour. During the 8-hour count there were approximately 26 to 36 trucks (7%). These volumes are well within the capacity of a two-lane rural roadway (500 to 900 vph).

3.4 FUTURE BACKGROUND TRAFFIC VOLUMES

In order to account for the overall growth in traffic on the roadways within the study area, a growth rate of 1.5% per annum was applied to the existing traffic volumes to obtain the year 2014 background traffic volumes. This rate of growth is considered fairly aggressive for rural communities and is a conservative approach to evaluating the impacts.

3.5 TRAFFIC GENERATED BY THE PROPOSED AGGREGATE OPERATION

3.5.1 Trip Generation

The annual tonnage that Lowndes Holdings Corp. is proposing to extract is 3 million tones. The extraction is expected to operate 200 days a year at an average of 15,000 tonnes per day.

The mix of truck sizes estimated to be used for shipping of the aggregate is as follows:

- 40 tonne trucks—29%
- 35 tonne trucks—41%

- 23 tonne trucks—29%
- 12 tonne trucks—1%

The weighted average capacity of this mix of trucks is 32.7 tonnes per truck resulting in 458 truck loads per day. However, there may be days when the average tonnage is exceeded. A 25% increase over the average was used to represent average maximum extraction days. The summary of truck sizes, numbers and tonnes shipped per day for an average maximum day is provided in Table 3.1.

Table 3.1
Summary of Trucks Generated on an Average Maximum Day to
Ship 3 Million Tonnes Annually

Truck Size	Truck Mix	No. of Trucks per Average Maximum Day	No. of Tonnes Shipped during Average Maximum Day by Truck Type
40 tonnes	29%	166	6,643 tonnes
35 tonnes	41%	235	8,218 tonnes
23 tonnes	29%	166	3,820 tonnes
12 tonnes	1%	6	69 tonnes
Weighted Average: 32.7 tonnes	Total:	573 trucks	18,750 tonnes

During an average maximum day, that is when production exceeds the average daily production by 25%, it is estimated that there would be approximately 570 trucks loads shipped. That is equivalent to 570 empty trucks entering the Proposed Dolostone Quarry and 570 loaded trucks exiting the Proposed Dolostone Quarry.

Generally, based on aggregate operations elsewhere in southern Ontario, 12% of the shipping traffic travels during the AM peak hour and 10% during the PM peak hour. Therefore, during the AM peak hour, the Proposed Dolostone Quarry is estimated to generate 70 trucks entering and 70 trucks exiting, and during the PM peak hour it is estimated to generate 60 trucks entering and 60 trucks exiting.

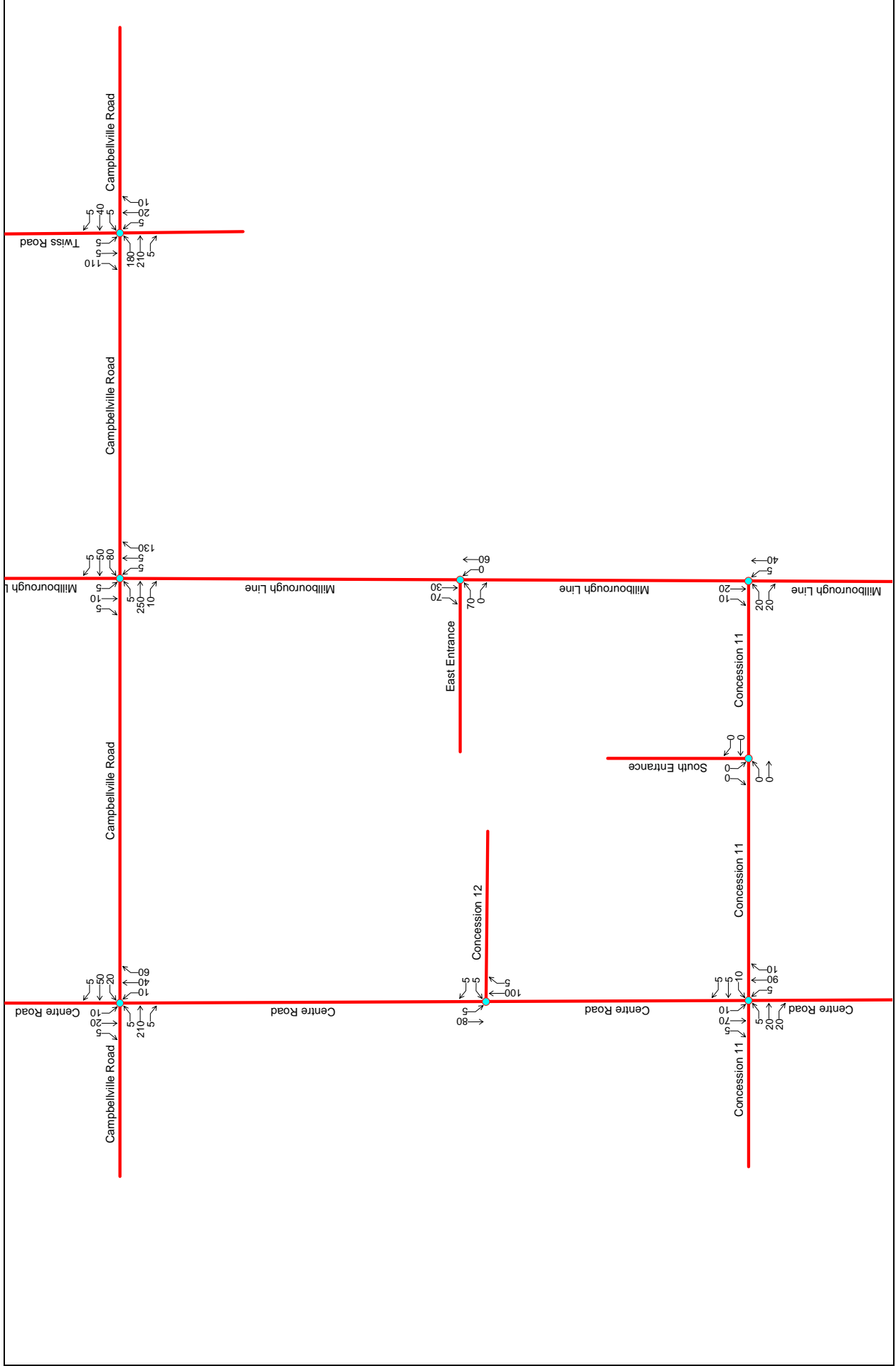
3.5.2 Trip Assignment

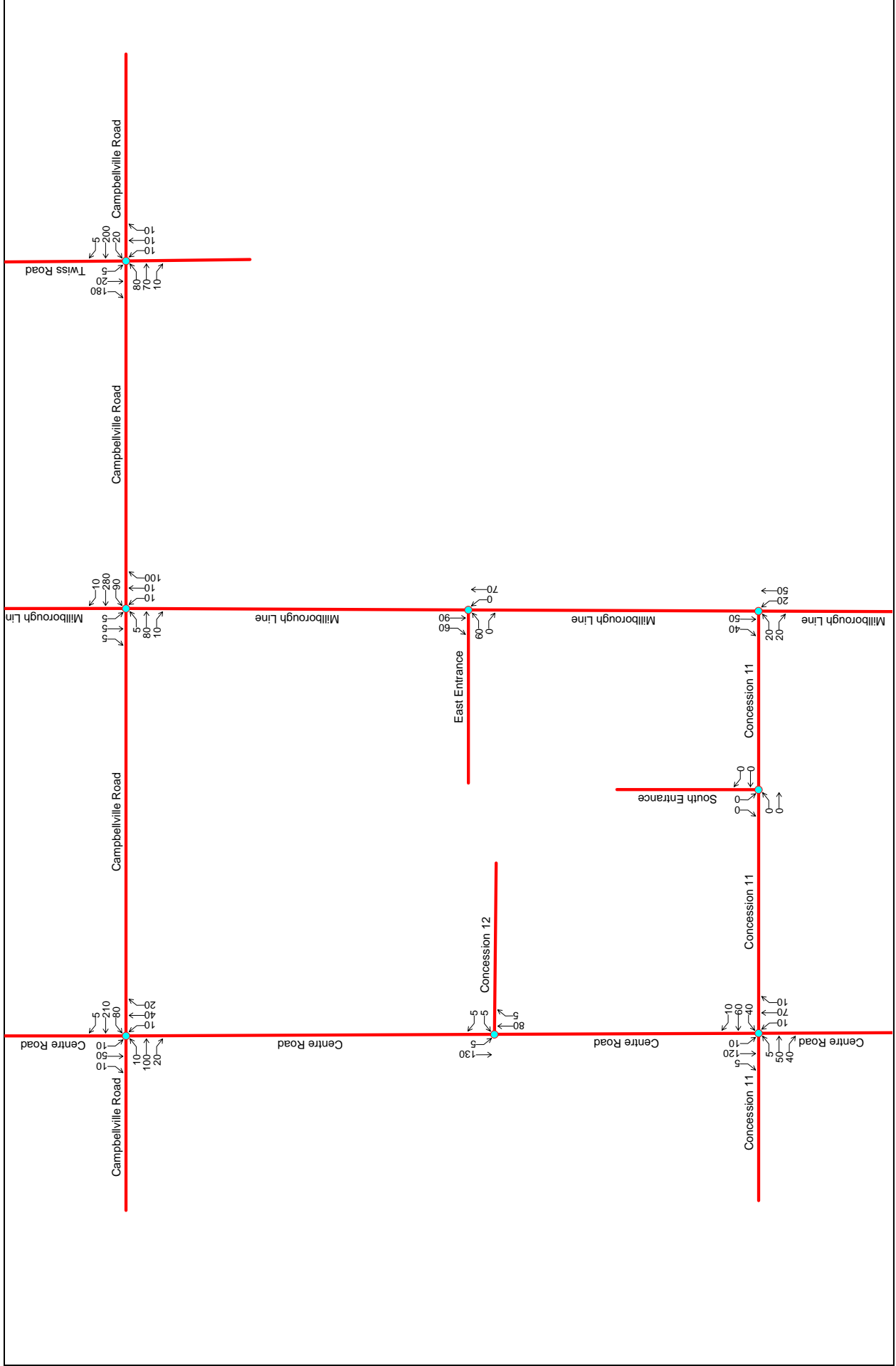
The truck traffic estimate to be generated by the Proposed Dolostone Quarry was assigned to the three potential accesses and the two truck haul routes. Four entrance/exit options were examined for both the AM and PM peak hours. The options are as follows:

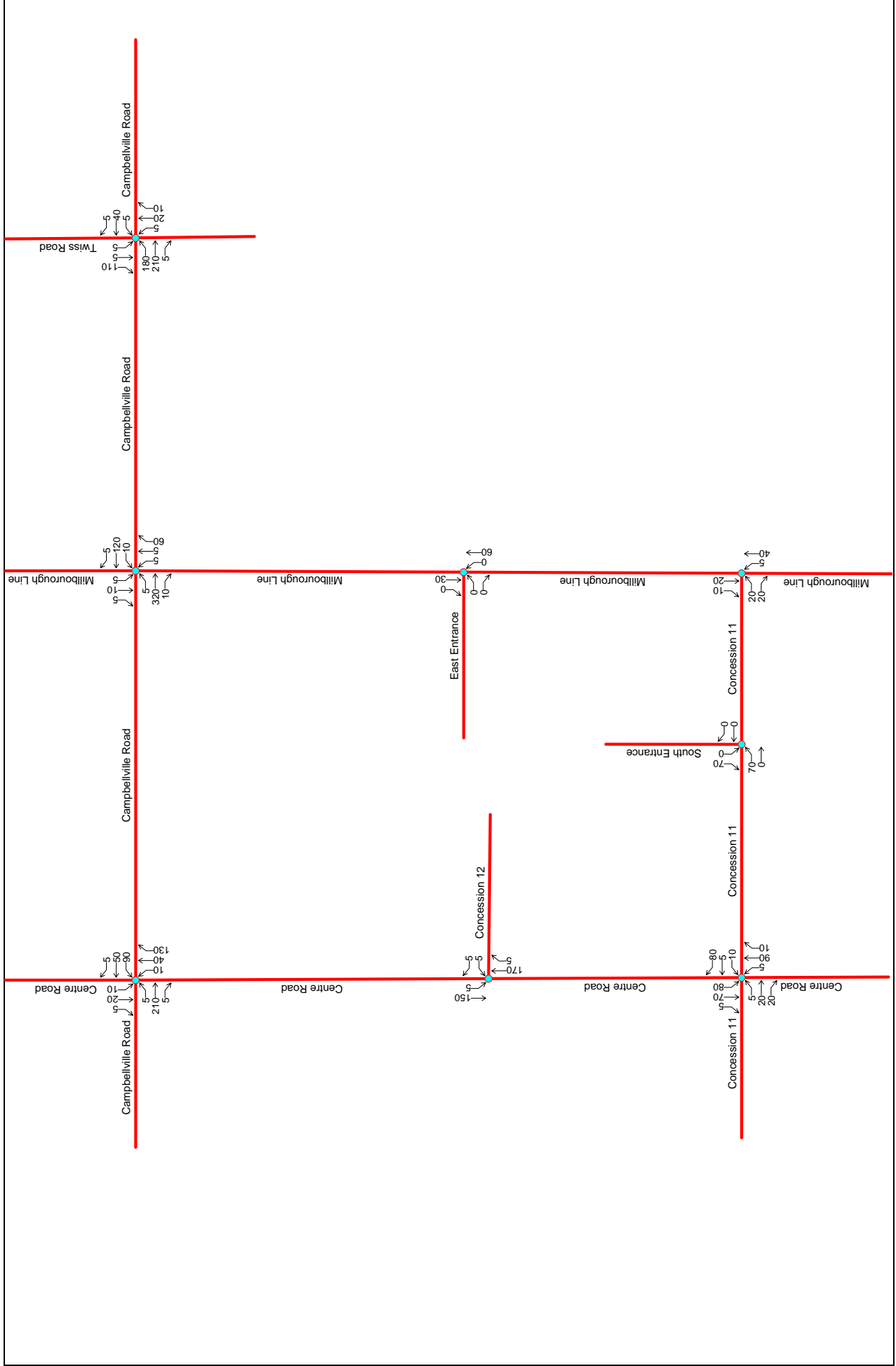
- Option 1—Access on 12th Concession extension, utilizing 12th Concession, Centre Road and Campbellville Road
- Option 2—Access on Millborough Line, utilizing Millborough Line and Campbellville Road

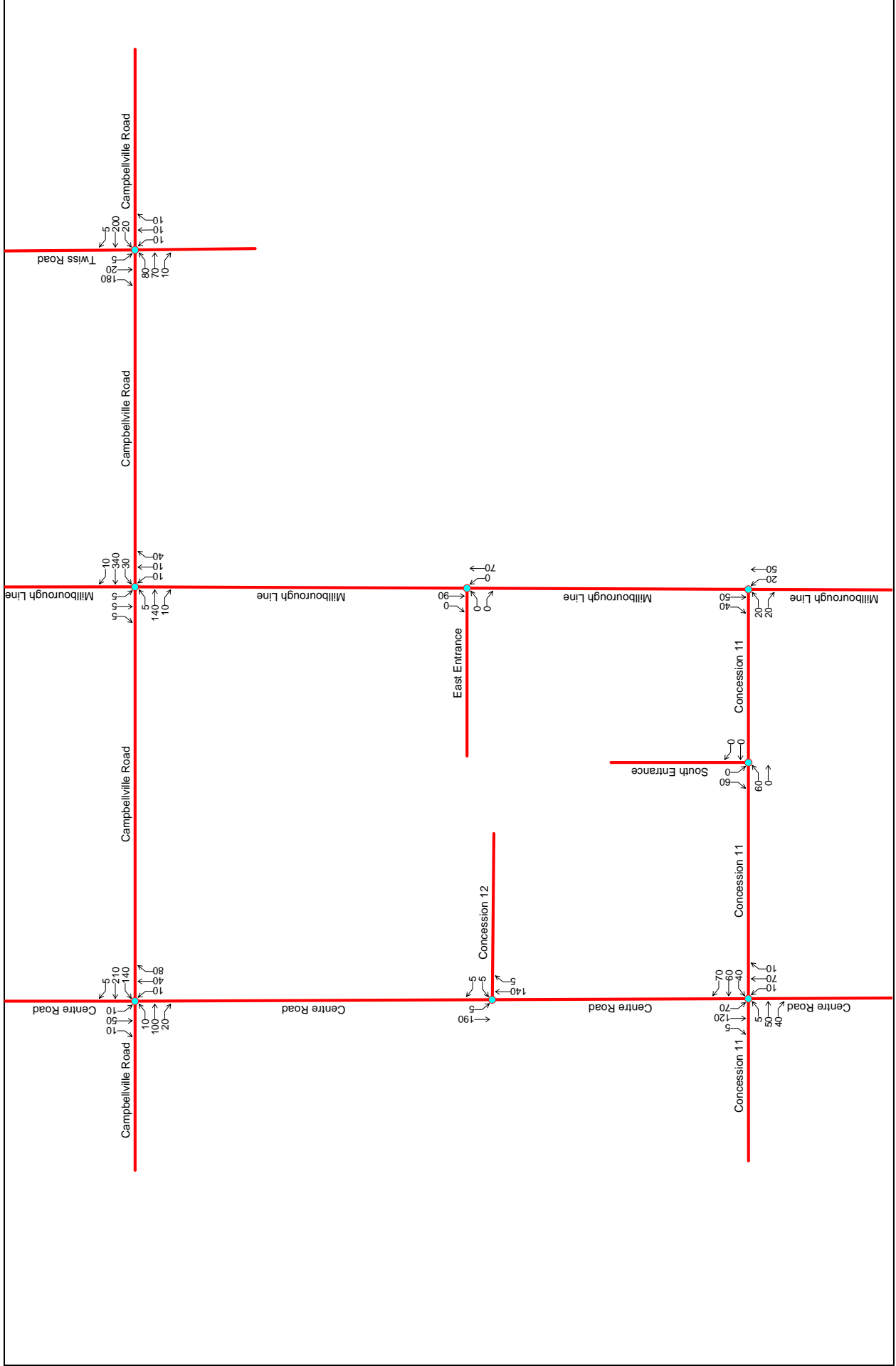
- Option 3—Access on 11th Concession, utilizing 11th Concession, Centre Road and Campbellville Road

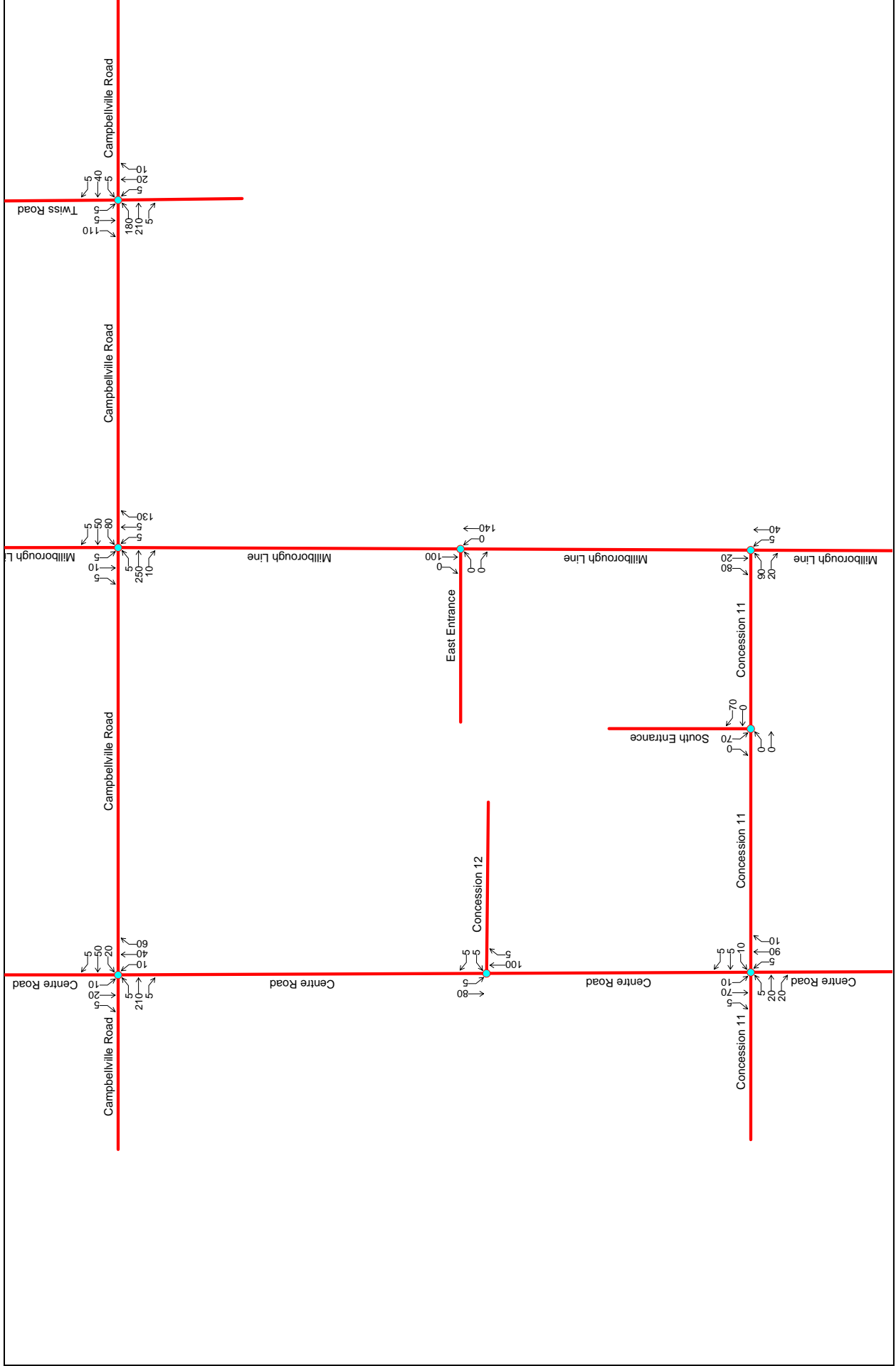
- Option 4—Access on 11th Concession, utilizing 11th Concession, Milborough Line and Campbellville Road

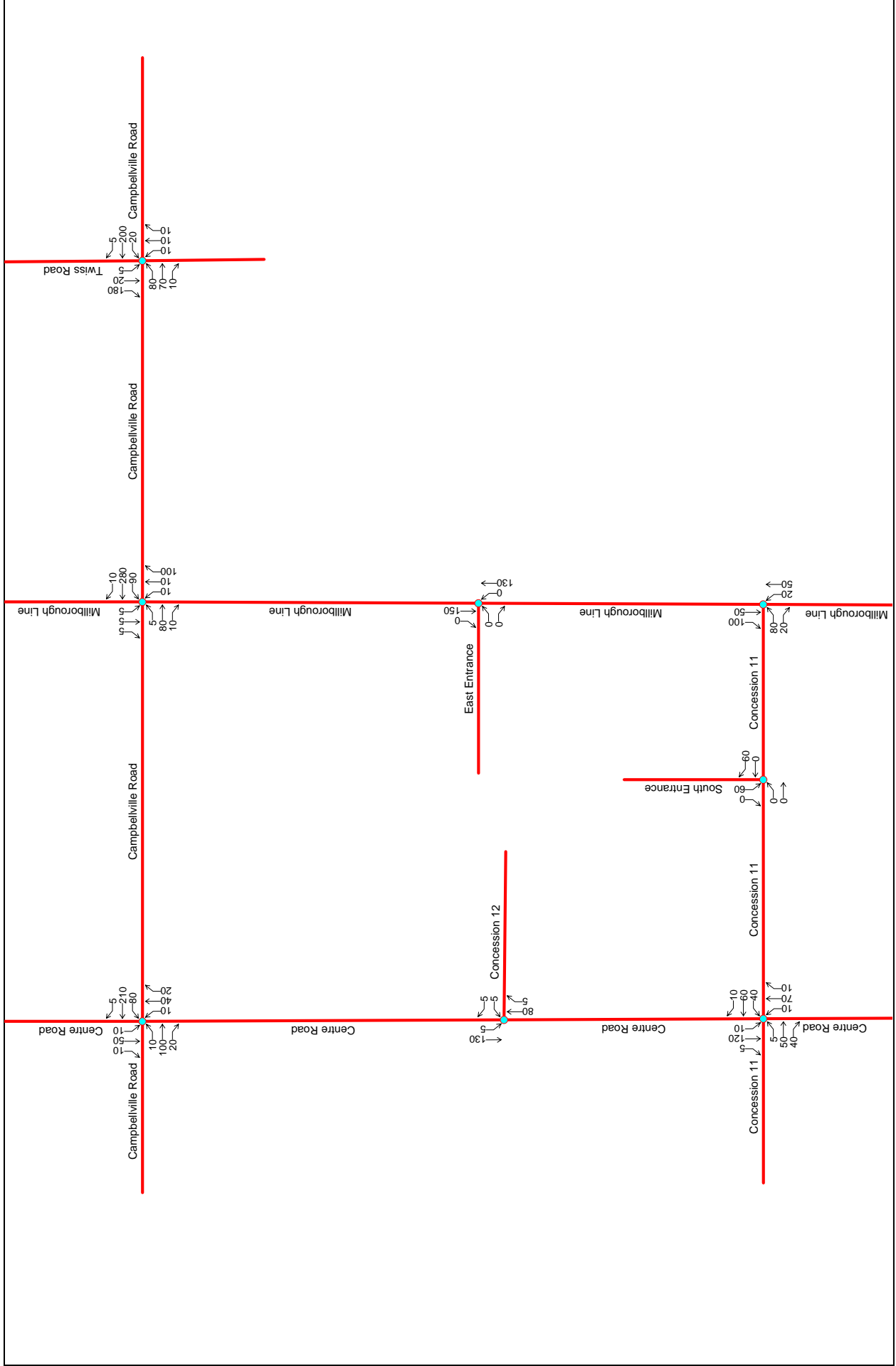












4.0 Evaluation of Impacts on Traffic Operations

4.1 METHODOLOGY

The Transportation Research Board's *Highway Capacity Manual 2000* (HCM2000) methodology and the software *Synchro* (Versions 6.0) was used to determine how well the key unsignalized intersections in the study area are operating under existing and future conditions.

The level of service for a two-way stop controlled (TWSC) intersection is determined by the measured control delay and is defined for each minor or stopped-controlled movement based on gaps on the major road. Level of service is not defined for the overall intersection. The criteria are as follows:

- **Level of service A** is the best level of operation at a two-way stop-controlled intersection and indicates minimal delay of less than 10 sec/veh
- **Level of service B** is a good level of operation with short delays of 10 to 15 sec/veh
- **Level of service C** (15 to 25 sec/veh of delay) and **level of service D** (25 to 35 sec/veh of delay) are acceptable levels of operation, with average to long delays
- At **level of service E**, the volume of traffic is approaching the capacity of the intersection and long delays of 35 to 50 sec/veh will occur. Drivers may accept shorter gaps in traffic resulting in less safe conditions
- At **level of service F**, the volume of traffic exceeds the capacity and very long delays of more than 50 sec/veh as well as queuing will occur

The HCM2000 analysis is based on the critical gap, the minimum time interval in the traffic stream that allows one vehicle to entry the intersection. Thus, the driver's critical gap is the minimum gap that would be acceptable, rejecting any gaps less than the minimum gap and accept gaps greater than or equal to the critical gap. The time between departure of one vehicle from the stop controlled minor street and the departure of the next vehicle using the same gap is called the follow-up time.

To account for heavy vehicles in HCM2000, the critical gap and follow-up time are lengthened to account for the lower rates of acceleration. The base critical gap and follow-up times for various vehicle movements at an unsignalized intersection are provided in Table 4.1. The critical gaps and follow-up times adjusted to account for heavy vehicles as various proportions of the total traffic volume are also presented to understand how trucks are accounted for in the analysis.

Table 4.1
Critical Gap and Follow-up Time

Vehicle Movement	Base Critical Gap (Two-lane Major Street), sec	5% trucks	10% trucks	30% trucks	50% trucks	80% trucks
Left turn from major street	4.1	4.2	4.2	4.4	4.6	5
Right turn from minor street	6.2	6.3	6.3	6.5	6.7	7.1
Through traffic on minor street	6.5	6.6	6.6	6.8	7.0	7.4
Left turn from minor street	7.1	7.2	7.2	7.4	7.6	8.0
Vehicle Movement	Base Follow-up Time, sec	5% trucks	10% trucks	30% trucks	50% trucks	80% trucks
Left turn from major street	2.2	2.3	2.3	2.5	2.7	3.0
Right turn from minor street	3.3	3.4	3.4	3.6	3.8	4.1
Through traffic on minor street	4.0	4.1	4.1	4.3	4.5	4.8
Left turn from minor street	3.5	3.6	3.6	3.8	4.0	4.3

Generally, when the trucks make up most of the traffic on a particular movement, they increase the critical gap accepted by 10% and the follow-up time by 20%. For the left-turn movement from the major street onto the minor street, if trucks make up most of the traffic, the critical gap accepted is increased by 20% and the follow-up time increased by 40%.

4.2 TRAFFIC OPERATIONS AT INTERSECTIONS

The evaluation of the intersections along the proposed haul routes and at the intersections of the potential site access are described below. Synchro outputs for unsignalized intersection analyses are provided in the Appendix for the various options analyzed. The analysis was based on the 2014 total traffic volume forecasts that includes a 1.5% per annum overall growth in traffic on the roadways plus the truck traffic estimated to be generated by the development of the Proposed Dolostone Quarry. Note that all

The left-turning traffic movements from Campbellville Road onto Milborough Line and onto Twiss Road operate at excellent levels of service (LOS A) with delay of less than 10 sec/veh during the AM and PM peak hours. The turning movements from the side roads (Milborough Line and Twiss Road) onto or crossing Campbellville Road operate at very good levels of service (LOS B) with delay of less than 13 sec/veh during the AM and PM peak hours.

4.2.1 Option 1— Access on 12th Concession Extension

The westbound left-turn movement from Campbellville Road to Centre Road will operate at an excellent level of service (LOS) A during the AM and PM peak hours, while the northbound right-turn from Centre Road to Campbellville road will operate at a good LOS B during the AM peak hour and an acceptable LOS C during the PM peak hour. The eastbound left-turn from Campbellville Road to Twiss Road will operate at an excellent LOS A during the AM and PM peak hours, while the southbound right-turn from Twiss Road to Campbellville Road will operate a good LOS B during the AM and PM peak hours.

4.2.2 Option 2— Access on Millbrough Line

The westbound left-turn from Campbellville Road to Milbrough Line will operate at an excellent LOS A during the AM and PM peak hours, while the northbound right-turn from Milbrough Line to Campbellville Road will operate at a good LOS B during the AM and PM peak hours. The eastbound left-turn from Campbellville Road to Twiss Road will operate at an excellent LOS A during the AM and PM peak hours, while the southbound right-turn from Twiss Road to Campbellville Road will operate a good LOS B during the AM and PM peak hours.

4.2.3 Option 3—Access on 11th Concession and Centre Road Haul Route

The southbound left-turn from Centre Road to 11th Concession will operate at an excellent LOS A during the AM and PM peak hours, while the westbound right-turn from 11th Concession to Centre Road will operate at a good LOS B during the AM and PM peak hours. The westbound left-turn from Campbellville Road to Centre Road will operate at an excellent level of service (LOS) A during the AM and PM peak hours, while the northbound right-turn from Centre Road to Campbellville road will operate at a good LOS B during the AM peak hour and an acceptable LOS C during the PM peak hour. The eastbound left-turn from Campbellville Road to Twiss Road will operate at an excellent LOS A during the AM and PM peak hours, while the southbound right-turn from Twiss Road to Campbellville Road will operate a good LOS B during the AM and PM peak hours.

4.2.4 Option 4—Access on 11th Concession and Milbrough Line Haul Route

The eastbound left-turn from 11th Concession to Milbrough Line will operate at a good LOS B during the AM and PM peak hours, while the southbound right-turn from Milbrough Line to 11th Concession will operate at an excellent LOS A during the AM and PM peak hours. The westbound left-turn from Campbellville Road to Milbrough Line will operate at an excellent LOS A during the AM and PM peak hours, while the northbound right-turn from Milbrough Line to Campbellville Road will operate at a good LOS B during the AM and PM peak hours. The eastbound left-turn from Campbellville Road to Twiss Road will operate at an excellent LOS A during the AM and PM peak hours, while the southbound right-turn from Twiss Road to Campbellville Road will operate a good LOS B during the AM and PM peak hours.

5.0 Site Access Evaluation

5.1 SIGHT DISTANCE REQUIREMENTS

One of the primary safety considerations in assessing access needs to properties is sight distance. Our assessment of sight distance is based on the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads* (1999).

There are several criteria, however, the most stringent is departure sight distance for vehicles turning out of the site onto the public roadway. It is measured from the eye height of the driver turning onto the roadway, assumed to be 2.1 m for a truck driver, to the top of a car approaching on the roadway, assumed to be a height of 1.3 m. The departure sight distances are as follows:

- To turn left (or right) onto the roadway across a vehicle approaching from the left (or right), 70 km/h design speed—275 m
- To turn right (or left) onto the roadway and attain 85% of the design speed without being overtaken by a vehicle approaching from the left (or right), 70 km/h design speed—410 m

For passenger cars on the public roadway approaching the access, desirable decision sight distance requirements should be met. It is measured from the eye height of the driver on the roadway approaching the access, assumed to be 1.05 m for a passenger car driver, to the taillights of a car on the roadway at the access, assumed to be 0.38 m in height. For a design speed of 70 km/h, the desirable decision sight distance is 275 m.

Three potential access locations were investigated in the field: 11th Concession East, Milborough Line and 12th Concession East as follows:

- On 11th Concession East, the access can be located from the existing westerly access easterly for 190 m and meet sight distance criteria.
- On Milborough Line, the access is located at an existing entrance 480 m north of 11th Concession East. The sight distance to the south on Milborough Line is deficient but can be corrected by lowering a hill located approximately 250 north of 11th Concession East by about one metre.
- On 12th Concession East, the roadway terminates at the access to the Bronte Creek Estates subdivision. It was assumed that an access to 12th Concession East would intersect at the existing termination achieving sight distance into Bronte Creek Estates, a local residential road with low operating speeds.

All sight distance criteria require verification in the field once a preferred final location is identified.

5.2 OTHER ISSUES

A summary of the issues associated with each potential access is provided in Table 5.1.

Table 5.1
Summary of Potential Access Issues

Access Option:	11 th Concession East	Milborough Line	12 th Concession East
<i>Potential access location based on sight distance criteria</i>	<ul style="list-style-type: none"> From the existing westerly access easterly for 180 m 	<ul style="list-style-type: none"> 480 m north of 11th Concession East. Requires lowering a hill located approximately 250 m north of 11th Concession East by about one meter 	<ul style="list-style-type: none"> At the termination of 12th Concession East at Bronte Creek Estates Note that sight distance at the intersection of 12th Concession East and Centre Road is limited
<i>Ownership</i>	<ul style="list-style-type: none"> South boundary of property at existing entrance 	<ul style="list-style-type: none"> East boundary of property at existing entrance 	<ul style="list-style-type: none"> Unopened road allowance subject to the Municipal Act to open or purchase
<i>Roadway alignment and grade</i>	<ul style="list-style-type: none"> Relatively straight horizontal alignment with some vertical curves that restrict sight distance Relatively steep grade west of property 	<ul style="list-style-type: none"> Relatively straight horizontal alignment with curvilinear alignment near 3 Side Road with some vertical curves that restrict sight distance 	<ul style="list-style-type: none"> Relatively straight horizontal alignment with some vertical curves that restrict sight distance Steep grade east of Centre Road
<i>Potential roadway improvements</i>	<ul style="list-style-type: none"> Pavement upgrading and shoulder upgrading and widening Widening of the Mountsberg Creek narrow structure if the haul route is to Centre Road 	<ul style="list-style-type: none"> Pavement upgrading and shoulder upgrading and widening Grade reduction by about 1 m of hill obscuring sight distance to the south 	<ul style="list-style-type: none"> Pavement upgrading and shoulder upgrading and widening Grade reduction/reconstruction approaching Centre Road
<i>Roadway jurisdiction and designations</i>	<ul style="list-style-type: none"> City of Hamilton: not designated as a truck route, designated a reduced loads roadway and has a posted March 1 to April 30 load restriction (5 tonnes per axle) 	<ul style="list-style-type: none"> Boundary road under joint jurisdiction Town of Milton: collector road with no access control City of Hamilton: not designated as a truck route, and designated a reduced loads roadway 	<ul style="list-style-type: none"> City of Hamilton: not designated as a truck route, and designated a reduced loads roadway
<i>Proximity to nearest truck route</i>	<ul style="list-style-type: none"> Centre Road at approximately 2 km to the west Campbellville Road via Milborough Line at approximately 5 km to the east and north 	<ul style="list-style-type: none"> Campbellville Road at approximately 3 km to the north 	<ul style="list-style-type: none"> Campbellville Road at approximately 2 km to the north

6.0 Summary of Findings

The annual tonnage that Lowndes Holdings Corp. is proposing to extract is 3 million tonnes. The extraction is expected to operate 200 days a year at an average of 15,000 tonnes per day.

During an average maximum day, that is when production exceeds the average daily production by 25%, it is estimated that there would be approximately 570 trucks loads shipped. That is equivalent to 570 empty trucks entering the Proposed Dolostone Quarry and 570 loaded trucks exiting the Proposed Dolostone Quarry.

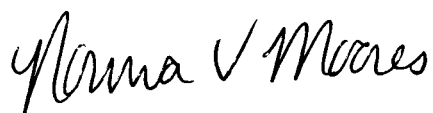
Generally, based on aggregate operations elsewhere in southern Ontario, 12% of the shipping traffic travels during the AM peak hour and 10% during the PM peak hour. Therefore, during the AM peak hour, the Proposed Dolostone Quarry is estimated to generate 70 trucks entering and 70 trucks exiting, and during the PM peak hour it is estimated to generate 60 trucks entering and 60 trucks exiting.

The Proposed Dolostone Quarry does not have direct access to designated truck routes, however, the nearest truck routes are 2 to 5 km away depending on the potential access developed, including Centre Road and Campbellville Road. These roadways have reduced load restrictions that apply March 1 to April 30 (5 tonnes per axle).

All of the key unsignalized intersections along the potential haul routes will operate at an acceptable level of service C or better with less than 25 sec/veh of delay over the next 10 years during the AM and PM peak hours with the addition of the traffic generated by the proposed quarry.

Three potential accesses were investigated on 11th Concession East, Milborough Line and 12th Concession East. All roadways on which the potential accesses are located may require pavement upgrading and shoulder widening and upgrading. The Milborough Line access would require reducing the grade of a hill by about one metre to achieve sight distance to and from the south. All of them are designated reduced loads roadways. 11th Concession East has a narrow structure over Mountsberg Creek that may require widening but has existing entrances to the property. 12th Concession East has a steep grade near Centre Road that may require reconstruction, is in close proximity to the rural residential Bronte Creek Estates subdivision, and would require opening or purchase of an unopened road allowance. Milborough Line is under joint jurisdiction and the access is located at an existing entrance.

STANTEC CONSULTING LTD.



Norma V. Moores, P.Eng.
Project Manager, Transportation

Stantec

**PROPOSED DOLOSTONE QUARRY, LOWNDES HOLDINGS CORP.
TRAFFIC IMPACT STUDY**

APPENDIX

Appendix

SYNCHRO 6 OUTPUT

SUMMARY C.V. FOR NORMA MOORES

TRANSPORTATION ENGINEER

Norma Moores P.Eng.



Norma provides professional services for transportation projects such as, planning and design for municipal and provincial roads, bike networks and pedestrian systems, and traffic operation and impact studies. She takes a balanced approach to mobility. Many projects have included public consultation programs for which Norma has been responsible for their format, organization and follow-up. Her honest approach to dealing with citizens' concerns has earned her a reputation of effective communication. She has participated in multi-disciplinary projects and is well versed in following the environmental assessment process. Norma is an expert in bicycle transportation, with a thorough knowledge of facilities, networks and policies. She is an instructor for the national "CanBike" courses, teaching safe-cycling skills to adults and children.

EDUCATION

Queen's University, Kingston, B.Sc., Civil Engineering, 1985

Basics of Fall Protection Training, Hamilton, 2002

WHMIS Training, Hamilton, 2002

Stantec's OH&S Project Managers Training, Hamilton, 2001

PROFESSIONAL AFFILIATIONS

Licensed, Professional Engineers of Ontario
Member, Institute of Transportation Engineers

Member, Association of Pedestrian and Bicycle Professionals

RECENT AWARDS

1999 National Honour Award for Planning Excellence, CIP, Kitchener Bikeway Study

1997 Award for Planning Excellence, OPPI, Welland Canals Parkway and Trails Master Plan



TRANSPORTATION ENGINEER
Norma Moores P.Eng.



PROJECT EXPERIENCE

EXPERT TESTIMONY / WITNESS

Columbia International College Student Residence Traffic Study, Hamilton (OMB Hearing)

Dakota Transport Facility Traffic Study, Brant County (OMB Hearing)

Corwhin Highlands Traffic Study, Puslinch (OMB Hearing)

Activa Subdivision, Baden (Traffic Engineer)

Jenning's Creek Secondary Plan, Lindsay (Traffic Engineer)

McDonald's Restaurant and Clappison's Power Centre, Flamborough (Traffic Engineer)

University Downs Shopping Centre and Tim Horton's Restaurant, Waterloo (Traffic Engineer)

STUDIES AND EVALUATIONS

Clair Meadows, Kitchener (Traffic Engineer)

Westminster Woods, Guelph (Traffic Engineer)

Georgian Villas, Georgian Bluffs (Traffic Engineer)

Bellwood Residential Development, Brantford (Traffic Engineer)

DiCarlo Townhouses, Streetsville (Traffic Engineer)

Country Flea Market, Brant County (Traffic Engineer)

Coreslab Proposed Ancaster and Flamborough facilities (Traffic Engineer)

Burlington Arts Centre Expansion (Traffic Engineer)

St. Joseph's Hospital Expansion, Hamilton (Traffic Engineer)

Laurentian Village, Waterloo (Traffic Engineer)

St. Benedict High School Redevelopment, Cambridge (Traffic Engineer)

Tolko Industries Ltd., Oriented Strand Board Mill, Hwy 17, Kenora (Traffic Engineer)

Reid's Heritage Homes Ltd., Proposed Class A License (gravel pit) and Residential Development, Puslinch (Traffic Engineer)

Victoria Centre Commercial Development, Kitchener (Traffic Engineer)

St. David Secondary School Addition, Waterloo (Traffic Engineer)

Cardigan-Norwich-London Rd Area, Guelph (Traffic Engineer)

Downtown Orono Parking Study (Project Co-Ordinator)



TRANSPORTATION ENGINEER
Norma Moores P.Eng.



Rouge River Business Park, Scarborough
(Traffic Engineer)

Sandy Point Recreational Development,
Peterborough County (Traffic Engineer)

Green Creek Pollution Control Centre
expansion, Ottawa (Traffic Engineer)

TRANSPORTATION

Kitchener Bikeway Study (Project Manager)

Welland Canals Parkway and Trails Master
Plan and Class EA (Project Engineer)

Woolwich St Corridor Study, Guelph, Class
EA (Project Co-Ordinator)

Frederick House River, Moose Creek and
Driftwood River Bridges Preliminary Design,
Hwy 101 (Traffic Engineer)

Northfield Drive Traffic Study, Waterloo
(Project Manager)

Eramosa Rd/Stevenson St Intersection,
Preliminary Design, Guelph (Traffic
Engineer)

Hwy 655 Preliminary Design for 21 km,
Timmins (Project Co-Ordinator)

Hwy 17 Preliminary Design for 26 km west
of Mattawa (Project Co-Ordinator)

Hwy 63 Preliminary Design for 37 km and
Design Review for 23 km (Project
Co-Ordinator)

Traffic Calming Features, Cleveland Ave,
Ithaca, New York (Project Engineer)

Parkhill Rd and Bridge Class EA, Cambridge
(Project Co-Ordinator)

King St Class EA, Waterloo (Traffic Engineer)

University of Waterloo Research &
Technology Park Modern Roundabouts
(Traffic Engineer)

Three Structure Replacements, Detail
Design, Fish Creek, Hwy 23, Kirkton (Traffic
Engineer)

Running Creek Bridge Replacement, Detail
Design, Hwy 40, Wallaceburg (Traffic
Engineer)

Hwy 93 Detail Design for 11 km, Waverley
(Traffic Engineer)

Temporary Traffic Signal Control Timing:
Hwy 89 (Mount Forest to Conn), Hwy 63
and Hwy 401/Regional Rd 97 (Traffic
Engineer)

Main St West Class EA and Detail Design,
Hamilton (Project Manager)



TRANSPORTATION ENGINEER
Norma Moores P.Eng.



Pine Ridge East and Westminister Woods
Subdivisions, Guelph, Modern Roundabouts
and Traffic Calming Features (Traffic
Engineer)

Downtown Cambridge Transportation Study
(Project Engineer)

Downtown Kitchener Transportation Study
(Project Engineer)

Nipissing Rd Traffic Study, Milton (Project
Manager)

Hwy 11/17 Four-laning Planning Study for
36 km near Dorion (Project Engineer)

Hwy 102 Planning Study, Thunder Bay
(Project Co-Ordinator)

TRANSPORTATION ENGINEER
Norma Moores P.Eng.



PUBLICATIONS

Freeway Trail Crossing Opens in Hamilton, ON, Transportation Talk, CITE, Vol. 24 No. 4 (2002)

















Ontario's First Modern Roundabouts: The Guelph Experience, ITE Toronto Section Roundabout Primer and Workshop (2002)

Instructor/Lecturer, Transportation Design Course, Mohawk College (1998)

Instructor/Lecturer, ITE's Bicycle Planning and Design Workshop (1998)

















Lowndes Property - Traffic Assessment
 1: Campbellville Road & Centre Road

Existing AM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	180	5	20	40	5	10	30	50	10	20	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	180	5	20	40	5	10	30	50	10	20	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	45			185			290	278	182	340	278	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			185			290	278	182	340	278	42
tC, single (s)	4.1			4.3			7.2	6.5	6.2	7.3	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.6	4.0	3.3	3.7	4.3	3.3
p0 queue free %	100			98			98	95	94	98	97	100
cM capacity (veh/h)	1576			1299			612	622	860	520	576	1034
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	190	65	90	35								
Volume Left	5	20	10	10								
Volume Right	5	5	50	5								
cSH	1576	1299	733	596								
Volume to Capacity	0.00	0.02	0.12	0.06								
Queue Length 95th (m)	0.1	0.4	3.3	1.5								
Control Delay (s)	0.2	2.5	10.6	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.5	10.6	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			25.9%		ICU Level of Service				A			
Analysis Period (min)			15									

















Lowndes Property - Traffic Assessment
2: Campbellville Road & Milborough Line

Existing AM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	250	10	10	50	5	5	5	60	5	10	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	250	10	10	50	5	5	5	60	5	10	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	55			260			348	340	255	400	342	52
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			260			348	340	255	400	342	52
tC, single (s)	4.1			4.3			7.6	7.2	6.3	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.4			4.0	4.6	3.4	3.5	4.0	3.8
p0 queue free %	100			99			99	99	92	99	98	99
cM capacity (veh/h)	1563			1217			512	484	774	512	576	895
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	65	70	20								
Volume Left	5	10	5	5								
Volume Right	10	5	60	5								
cSH	1563	1217	717	611								
Volume to Capacity	0.00	0.01	0.10	0.03								
Queue Length 95th (m)	0.1	0.2	2.6	0.8								
Control Delay (s)	0.2	1.3	10.6	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	1.3	10.6	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			25.7%		ICU Level of Service				A			
Analysis Period (min)			15									

















Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

Existing AM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	90	180	5	5	30	5	5	20	10	5	5	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	90	180	5	5	30	5	5	20	10	5	5	30
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	35			185			438	408	182	425	408	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35			185			438	408	182	425	408	32
tC, single (s)	4.2			4.4			7.4	6.6	6.3	8.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.5			3.8	4.1	3.4	4.4	4.0	3.4
p0 queue free %	94			100			99	96	99	99	99	97
cM capacity (veh/h)	1520			1223			440	488	830	367	502	1024
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	275	40	35	40								
Volume Left	90	5	5	5								
Volume Right	5	5	10	30								
cSH	1520	1223	544	757								
Volume to Capacity	0.06	0.00	0.06	0.05								
Queue Length 95th (m)	1.5	0.1	1.6	1.3								
Control Delay (s)	2.8	1.0	12.1	10.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.8	1.0	12.1	10.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			31.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
4: Concession 11 & Centre Road

Existing AM Traffic Volumes










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			1%			0%			0%	
Volume (veh/h)	5	20	20	10	5	5	5	80	10	10	60	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	20	20	10	5	5	5	80	10	10	60	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	185	182	62	208	180	85	65			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185	182	62	208	180	85	65			90		
tC, single (s)	7.4	6.5	6.4	7.1	6.7	6.2	4.1			4.5		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	3.5	4.2	3.3	2.2			2.6		
p0 queue free %	99	97	98	99	99	99	100			99		
cM capacity (veh/h)	699	707	944	716	675	980	1550			1279		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	45	20	95	75								
Volume Left	5	10	5	10								
Volume Right	20	5	10	5								
cSH	795	756	1550	1279								
Volume to Capacity	0.06	0.03	0.00	0.01								
Queue Length 95th (m)	1.4	0.7	0.1	0.2								
Control Delay (s)	9.8	9.9	0.4	1.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.8	9.9	0.4	1.1								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			17.1%		ICU Level of Service					A		
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
 5: Concession 11 & Milbrough Line

Existing AM Traffic Volumes

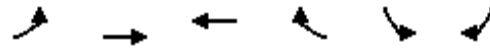


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	1%			0%	4%	
Volume (veh/h)	20	20	5	30	20	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	20	5	30	20	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	65	25	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65	25	30			
tC, single (s)	6.5	6.4	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.5	2.2			
p0 queue free %	98	98	100			
cM capacity (veh/h)	928	991	1596			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	40	35	30			
Volume Left	20	5	0			
Volume Right	20	0	10			
cSH	958	1596	1700			
Volume to Capacity	0.04	0.00	0.02			
Queue Length 95th (m)	1.0	0.1	0.0			
Control Delay (s)	8.9	1.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	1.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	90	0	0	70
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	90	0	0	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	160	90			90	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	90			90	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	831	968			1505	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	90	70			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1505			
Volume to Capacity	0.00	0.05	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		8.1%		ICU Level of Service	A	
Analysis Period (min)		15				

Lowndes Property - Traffic Assessment
7: Concession 11 & South Entrance










Existing AM Traffic Volumes



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service	A	
Analysis Period (min)			15			

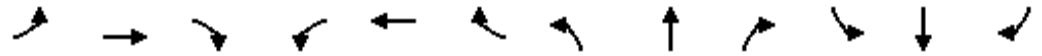
Lowndes Property - Traffic Assessment
8: East Entrance & Milbrough Line

Existing AM Traffic Volumes

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	50	30	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	50	30	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	80	30	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	30	30			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	922	1044	1583			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	50	30			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1583	1700			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

Lowndes Property - Traffic Assessment
 1: Campbellville Road & Centre Road

2014 AM
 Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	210	5	90	50	5	10	40	130	10	20	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	233	6	100	56	6	11	44	144	11	22	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	61			239			522	508	236	672	508	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			239			522	508	236	672	508	58
tC, single (s)	4.1			4.9			7.2	6.5	6.7	7.3	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.9			3.6	4.0	3.8	3.7	4.3	3.3
p0 queue free %	100			90			97	89	79	95	94	99
cM capacity (veh/h)	1555			987			392	421	690	232	386	1013
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	244	161	200	39								
Volume Left	6	100	11	11								
Volume Right	6	6	144	6								
cSH	1555	987	583	350								
Volume to Capacity	0.00	0.10	0.34	0.11								
Queue Length 95th (m)	0.1	2.7	12.2	3.0								
Control Delay (s)	0.2	6.0	14.4	16.6								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.2	6.0	14.4	16.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			40.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
 2: Campbellville Road & Millborough Line

2014 AM
 Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	320	10	10	120	5	5	5	60	5	10	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	356	11	11	133	6	6	6	67	6	11	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	139			367			542	533	361	600	536	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			367			542	533	361	600	536	136
tC, single (s)	4.1			4.3			7.6	7.2	6.3	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.4			4.0	4.6	3.4	3.5	4.0	3.8
p0 queue free %	100			99			99	98	90	98	98	99
cM capacity (veh/h)	1457			1109			371	368	675	366	447	799
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	372	150	78	22								
Volume Left	6	11	6	6								
Volume Right	11	6	67	6								
cSH	1457	1109	603	473								
Volume to Capacity	0.00	0.01	0.13	0.05								
Queue Length 95th (m)	0.1	0.2	3.5	1.2								
Control Delay (s)	0.1	0.7	11.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.7	11.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			29.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

2014 AM
Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	180	210	5	5	40	5	5	20	10	5	5	110
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	200	233	6	6	44	6	6	22	11	6	6	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	50			239			819	697	236	717	697	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			239			819	697	236	717	697	47
tC, single (s)	4.5			4.4			7.4	6.6	6.3	8.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.6			2.5			3.8	4.1	3.4	4.4	4.0	3.9
p0 queue free %	85			100			97	93	99	97	98	86
cM capacity (veh/h)	1350			1166			196	301	774	201	311	871
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	439	56	39	133								
Volume Left	200	6	6	6								
Volume Right	6	6	11	122								
cSH	1350	1166	333	718								
Volume to Capacity	0.15	0.00	0.12	0.19								
Queue Length 95th (m)	4.2	0.1	3.1	5.4								
Control Delay (s)	4.5	0.8	17.2	11.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.5	0.8	17.2	11.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			42.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
2: Campbellville Road & Millbrough Line

2014 AM
East exit at Millbrough Line



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	250	10	80	50	5	5	5	130	5	10	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	278	11	89	56	6	6	6	144	6	11	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	61			289			542	533	283	678	536	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			289			542	533	283	678	536	58
tC, single (s)	4.1			5.0			7.6	7.2	6.7	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			3.0			4.0	4.6	3.8	3.5	4.0	3.8
p0 queue free %	100			90			98	98	78	98	97	99
cM capacity (veh/h)	1555			908			346	335	647	261	408	888
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	150	156	22								
Volume Left	6	89	6	6								
Volume Right	11	6	144	6								
cSH	1555	908	608	406								
Volume to Capacity	0.00	0.10	0.26	0.05								
Queue Length 95th (m)	0.1	2.6	8.1	1.4								
Control Delay (s)	0.2	6.0	12.9	14.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	6.0	12.9	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			40.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

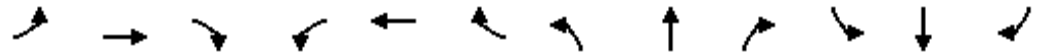
2014 AM
East exit at Millborough Line



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	180	210	5	5	40	5	5	20	10	5	5	110
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	200	233	6	6	44	6	6	22	11	6	6	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	50			239			819	697	236	717	697	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			239			819	697	236	717	697	47
tC, single (s)	4.5			4.4			7.4	6.6	6.3	8.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.6			2.5			3.8	4.1	3.4	4.4	4.0	3.9
p0 queue free %	85			100			97	93	99	97	98	86
cM capacity (veh/h)	1350			1166			196	301	774	201	311	871
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	439	56	39	133								
Volume Left	200	6	6	6								
Volume Right	6	6	11	122								
cSH	1350	1166	333	718								
Volume to Capacity	0.15	0.00	0.12	0.19								
Queue Length 95th (m)	4.2	0.1	3.1	5.4								
Control Delay (s)	4.5	0.8	17.2	11.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.5	0.8	17.2	11.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			42.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
 1: Campbellville Road & Centre Road

2014 AM
 South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	210	5	90	50	5	10	40	130	10	20	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	233	6	100	56	6	11	44	144	11	22	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	61			239			522	508	236	672	508	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			239			522	508	236	672	508	58
tC, single (s)	4.1			4.9			7.2	6.5	6.7	7.3	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.9			3.6	4.0	3.8	3.7	4.3	3.3
p0 queue free %	100			90			97	89	79	95	94	99
cM capacity (veh/h)	1555			987			392	421	690	232	386	1013
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	244	161	200	39								
Volume Left	6	100	11	11								
Volume Right	6	6	144	6								
cSH	1555	987	583	350								
Volume to Capacity	0.00	0.10	0.34	0.11								
Queue Length 95th (m)	0.1	2.7	12.2	3.0								
Control Delay (s)	0.2	6.0	14.4	16.6								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.2	6.0	14.4	16.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			40.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
2: Campbellville Road & Millborough Line

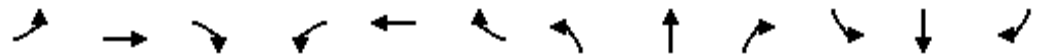
2014 AM
South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	320	10	10	120	5	5	5	60	5	10	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	356	11	11	133	6	6	6	67	6	11	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	139			367			542	533	361	600	536	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			367			542	533	361	600	536	136
tC, single (s)	4.1			4.3			7.6	7.1	6.3	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.4			4.0	4.5	3.4	3.5	4.0	3.8
p0 queue free %	100			99			99	99	90	98	98	99
cM capacity (veh/h)	1457			1109			371	378	675	367	447	799
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	372	150	78	22								
Volume Left	6	11	6	6								
Volume Right	11	6	67	6								
cSH	1457	1109	605	473								
Volume to Capacity	0.00	0.01	0.13	0.05								
Queue Length 95th (m)	0.1	0.2	3.5	1.2								
Control Delay (s)	0.1	0.7	11.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.7	11.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			29.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

2014 AM
South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	180	210	5	5	40	5	5	20	10	5	5	110
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	200	233	6	6	44	6	6	22	11	6	6	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	50			239			819	697	236	717	697	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			239			819	697	236	717	697	47
tC, single (s)	4.5			4.4			7.4	6.6	6.3	8.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.6			2.5			3.8	4.1	3.4	4.4	4.0	3.9
p0 queue free %	85			100			97	93	99	97	98	86
cM capacity (veh/h)	1350			1166			196	301	774	201	311	871
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	439	56	39	133								
Volume Left	200	6	6	6								
Volume Right	6	6	11	122								
cSH	1350	1166	333	718								
Volume to Capacity	0.15	0.00	0.12	0.19								
Queue Length 95th (m)	4.2	0.1	3.1	5.4								
Control Delay (s)	4.5	0.8	17.2	11.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.5	0.8	17.2	11.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			42.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
4: Concession 11 & Centre Road

2014 AM
South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			1%			0%			0%	
Volume (veh/h)	5	20	20	10	5	80	5	90	10	80	70	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	22	22	11	6	89	6	100	11	89	78	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	467	381	81	408	378	106	83			111		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	381	81	408	378	106	83			111		
tC, single (s)	7.4	6.5	6.4	7.1	6.7	7.1	4.1			5.0		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	3.5	4.2	4.1	2.2			3.0		
p0 queue free %	99	96	98	98	99	88	100			92		
cM capacity (veh/h)	375	508	922	491	481	759	1526			1080		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	50	106	117	172								
Volume Left	6	11	6	89								
Volume Right	22	89	11	6								
cSH	605	697	1526	1080								
Volume to Capacity	0.08	0.15	0.00	0.08								
Queue Length 95th (m)	2.2	4.2	0.1	2.1								
Control Delay (s)	11.5	11.1	0.4	4.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.5	11.1	0.4	4.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization		29.3%			ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	250	10	80	50	5	5	5	130	5	10	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	278	11	89	56	6	6	6	144	6	11	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	61			289			542	533	283	678	536	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			289			542	533	283	678	536	58
tC, single (s)	4.1			5.0			7.6	7.2	6.7	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			3.0			4.0	4.6	3.8	3.5	4.0	3.8
p0 queue free %	100			90			98	98	78	98	97	99
cM capacity (veh/h)	1555			908			346	335	647	261	408	888
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	150	156	22								
Volume Left	6	89	6	6								
Volume Right	11	6	144	6								
cSH	1555	908	608	406								
Volume to Capacity	0.00	0.10	0.26	0.05								
Queue Length 95th (m)	0.1	2.6	8.1	1.4								
Control Delay (s)	0.2	6.0	12.9	14.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	6.0	12.9	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			40.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

2014 AM
South exit at Concession 11 to Millborough Line



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	180	210	5	5	40	5	5	20	10	5	5	110
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	200	233	6	6	44	6	6	22	11	6	6	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	50			239			819	697	236	717	697	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			239			819	697	236	717	697	47
tC, single (s)	4.5			4.4			7.4	6.6	6.2	8.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.6			2.5			3.8	4.1	3.3	4.4	4.0	3.9
p0 queue free %	85			100			97	93	99	97	98	86
cM capacity (veh/h)	1350			1166			196	301	798	202	311	871
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	439	56	39	133								
Volume Left	200	6	6	6								
Volume Right	6	6	11	122								
cSH	1350	1166	335	718								
Volume to Capacity	0.15	0.00	0.12	0.19								
Queue Length 95th (m)	4.2	0.1	3.1	5.4								
Control Delay (s)	4.5	0.8	17.2	11.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.5	0.8	17.2	11.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			42.6%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	1%			0%	4%	
Volume (veh/h)	90	20	5	40	20	80
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	22	6	44	22	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	122	67	111			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	67	111			
tC, single (s)	7.2	6.4	4.1			
tC, 2 stage (s)						
tF (s)	4.2	3.5	2.2			
p0 queue free %	86	98	100			
cM capacity (veh/h)	718	939	1491			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	122	50	111			
Volume Left	100	6	0			
Volume Right	22	0	89			
cSH	750	1491	1700			
Volume to Capacity	0.16	0.00	0.07			
Queue Length 95th (m)	4.6	0.1	0.0			
Control Delay (s)	10.7	0.9	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.7	0.9	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization		19.2%		ICU Level of Service		A
Analysis Period (min)			15			

















Lowndes Property - Traffic Assessment
 1: Campbellville Road & Centre Road

Existing PM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	90	20	70	180	5	10	30	20	10	40	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	90	20	70	180	5	10	30	20	10	40	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	185			110			472	445	100	478	452	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185			110			472	445	100	478	452	182
tC, single (s)	4.2			4.2			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			95			98	94	98	98	92	99
cM capacity (veh/h)	1326			1456			448	483	919	448	475	865
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	255	60	60								
Volume Left	10	70	10	10								
Volume Right	20	5	20	10								
cSH	1326	1456	565	508								
Volume to Capacity	0.01	0.05	0.11	0.12								
Queue Length 95th (m)	0.2	1.2	2.8	3.2								
Control Delay (s)	0.7	2.4	12.1	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.7	2.4	12.1	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			31.5%		ICU Level of Service				A			
Analysis Period (min)			15									

















Lowndes Property - Traffic Assessment
2: Campbellville Road & Milborough Line

Existing PM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	80	10	30	280	10	10	10	40	5	5	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	80	10	30	280	10	10	10	40	5	5	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	290			90			448	445	85	485	445	285
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			90			448	445	85	485	445	285
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			98			98	98	96	99	99	99
cM capacity (veh/h)	1283			1518			508	499	958	459	499	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	95	320	60	15								
Volume Left	5	30	10	5								
Volume Right	10	10	40	5								
cSH	1283	1518	736	545								
Volume to Capacity	0.00	0.02	0.08	0.03								
Queue Length 95th (m)	0.1	0.5	2.1	0.7								
Control Delay (s)	0.4	0.9	10.3	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.9	10.3	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			34.3%		ICU Level of Service				A			
Analysis Period (min)			15									

















Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

Existing PM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	60	10	20	180	5	10	10	10	5	20	100
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	60	10	20	180	5	10	10	10	5	20	100
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	185			70			438	330	65	342	332	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185			70			438	330	65	342	332	182
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	99	97	88
cM capacity (veh/h)	1372			1544			449	576	966	588	574	857
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	90	205	30	125								
Volume Left	20	20	10	5								
Volume Right	10	5	10	100								
cSH	1372	1544	600	782								
Volume to Capacity	0.01	0.01	0.05	0.16								
Queue Length 95th (m)	0.4	0.3	1.3	4.5								
Control Delay (s)	1.8	0.8	11.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.8	0.8	11.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			26.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
4: Concession 11 & Centre Road

Existing PM Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			1%			0%			0%	
Volume (veh/h)	5	40	30	30	50	10	10	60	10	10	100	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	40	30	30	50	10	10	60	10	10	100	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	242	212	102	258	210	65	105			70		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242	212	102	258	210	65	105			70		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	94	97	95	93	99	99			99		
cM capacity (veh/h)	662	676	931	634	682	1005	1499			1544		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	75	90	80	115								
Volume Left	5	30	10	10								
Volume Right	30	10	10	5								
cSH	758	689	1499	1544								
Volume to Capacity	0.10	0.13	0.01	0.01								
Queue Length 95th (m)	2.6	3.6	0.2	0.2								
Control Delay (s)	10.3	11.0	1.0	0.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.3	11.0	1.0	0.7								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			25.7%		ICU Level of Service					A		
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
5: Concession 11 & Milbrough Line

Existing PM Traffic Volumes



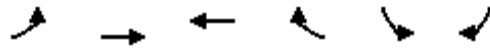
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	1%			0%	4%	
Volume (veh/h)	20	20	20	40	40	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	20	20	40	40	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	135	55	70			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135	55	70			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	852	1018	1544			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	40	60	70			
Volume Left	20	20	0			
Volume Right	20	0	30			
cSH	928	1544	1700			
Volume to Capacity	0.04	0.01	0.04			
Queue Length 95th (m)	1.1	0.3	0.0			
Control Delay (s)	9.1	2.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	2.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization	19.9%		ICU Level of Service	A		
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	70	0	0	110
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	70	0	0	110
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	180	70			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180	70			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	810	993			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	70	110			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1531			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			9.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lowndes Property - Traffic Assessment
7: Concession 11 & South Entrance










Existing PM Traffic Volumes



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

Lowndes Property - Traffic Assessment
 8: East Entrance & Milbrough Line

Existing PM Traffic Volumes

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	60	70	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	60	70	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130	70	70			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	70	70			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	864	993	1531			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	60	70			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1531	1700			
Volume to Capacity	0.00	0.00	0.04			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		7.0%		ICU Level of Service		A
Analysis Period (min)			15			

Lowndes Property - Traffic Assessment
1: Campbellville Road & Centre Road

2014 PM
Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	100	20	140	210	5	10	40	80	10	50	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	111	22	156	233	6	11	44	89	11	56	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	239			133			731	694	122	803	703	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	239			133			731	694	122	803	703	236
tC, single (s)	4.2			4.5			7.1	6.5	7.0	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.6			3.5	4.0	4.0	3.5	4.0	3.3
p0 queue free %	99			87			96	86	88	95	82	99
cM capacity (veh/h)	1266			1234			261	319	765	216	314	808
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	144	394	144	78								
Volume Left	11	156	11	11								
Volume Right	22	6	89	11								
cSH	1266	1234	485	321								
Volume to Capacity	0.01	0.13	0.30	0.24								
Queue Length 95th (m)	0.2	3.5	9.9	7.4								
Control Delay (s)	0.7	4.0	15.6	19.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	4.0	15.6	19.8								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			41.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
2: Campbellville Road & Millborough Line

2014 PM
Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	140	10	30	340	10	10	10	40	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	156	11	33	378	11	11	11	44	6	6	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	389			167			631	628	161	672	628	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	389			167			631	628	161	672	628	383
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			98			97	97	95	98	99	99
cM capacity (veh/h)	1181			1424			381	391	868	338	391	669
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	172	422	67	17								
Volume Left	6	33	11	6								
Volume Right	11	11	44	6								
cSH	1181	1424	613	428								
Volume to Capacity	0.00	0.02	0.11	0.04								
Queue Length 95th (m)	0.1	0.6	2.9	1.0								
Control Delay (s)	0.3	0.8	11.6	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.6	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			42.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

2014 PM
Exit at Concession 12



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	70	10	20	200	5	10	10	10	5	20	180
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	78	11	22	222	6	11	11	11	6	22	200
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228			89			742	533	83	547	536	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			89			742	533	83	547	536	225
tC, single (s)	4.8			4.1			7.1	6.5	6.3	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.9			2.2			3.5	4.0	3.4	3.5	4.0	3.6
p0 queue free %	91			99			95	97	99	99	95	73
cM capacity (veh/h)	1008			1519			216	409	944	402	408	743
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	178	250	33	228								
Volume Left	89	22	11	6								
Volume Right	11	6	11	200								
cSH	1008	1519	369	675								
Volume to Capacity	0.09	0.01	0.09	0.34								
Queue Length 95th (m)	2.3	0.4	2.4	11.9								
Control Delay (s)	4.9	0.8	15.7	13.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.9	0.8	15.7	13.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			43.2%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	80	10	90	280	10	10	10	100	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	89	11	100	311	11	11	11	111	6	6	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	322			100			631	628	94	739	628	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	322			100			631	628	94	739	628	317
tC, single (s)	4.1			4.8			7.1	6.5	6.8	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.8			3.5	4.0	3.8	3.5	4.0	3.3
p0 queue free %	100			91			97	97	87	98	98	99
cM capacity (veh/h)	1249			1169			362	366	824	264	366	729
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	422	133	17								
Volume Left	6	100	11	6								
Volume Right	11	11	111	6								
cSH	1249	1169	681	381								
Volume to Capacity	0.00	0.09	0.20	0.04								
Queue Length 95th (m)	0.1	2.2	5.8	1.1								
Control Delay (s)	0.5	2.7	11.6	14.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	2.7	11.6	14.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			41.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

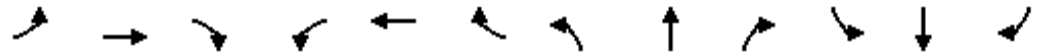
2014 PM
East exit at Millborough Line



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	70	10	20	200	5	10	10	10	5	20	180
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	78	11	22	222	6	11	11	11	6	22	200
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228			89			742	533	83	547	536	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			89			742	533	83	547	536	225
tC, single (s)	4.8			4.1			7.1	6.5	6.3	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.9			2.2			3.5	4.0	3.4	3.5	4.0	3.6
p0 queue free %	91			99			95	97	99	99	95	73
cM capacity (veh/h)	1008			1519			216	409	944	402	408	743
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	178	250	33	228								
Volume Left	89	22	11	6								
Volume Right	11	6	11	200								
cSH	1008	1519	369	675								
Volume to Capacity	0.09	0.01	0.09	0.34								
Queue Length 95th (m)	2.3	0.4	2.4	11.9								
Control Delay (s)	4.9	0.8	15.7	13.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.9	0.8	15.7	13.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			43.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
 1: Campbellville Road & Centre Road

2014 PM
 South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	100	20	140	210	5	10	40	80	10	50	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	111	22	156	233	6	11	44	89	11	56	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	239			133			731	694	122	803	703	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	239			133			731	694	122	803	703	236
tC, single (s)	4.2			4.5			7.1	6.5	7.0	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.6			3.5	4.0	4.0	3.5	4.0	3.3
p0 queue free %	99			87			96	86	88	95	82	99
cM capacity (veh/h)	1266			1234			261	319	765	216	314	808
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	144	394	144	78								
Volume Left	11	156	11	11								
Volume Right	22	6	89	11								
cSH	1266	1234	485	321								
Volume to Capacity	0.01	0.13	0.30	0.24								
Queue Length 95th (m)	0.2	3.5	9.9	7.4								
Control Delay (s)	0.7	4.0	15.6	19.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	4.0	15.6	19.8								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			41.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
2: Campbellville Road & Millborough Line

2014 PM
South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	140	10	30	340	10	10	10	40	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	156	11	33	378	11	11	11	44	6	6	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None				None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	389			167			631	628	161	672	628	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	389			167			631	628	161	672	628	383
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			98			97	97	95	98	99	99
cM capacity (veh/h)	1181			1424			381	391	868	338	391	669
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	172	422	67	17								
Volume Left	6	33	11	6								
Volume Right	11	11	44	6								
cSH	1181	1424	613	428								
Volume to Capacity	0.00	0.02	0.11	0.04								
Queue Length 95th (m)	0.1	0.6	2.9	1.0								
Control Delay (s)	0.3	0.8	11.6	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.6	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			42.3%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	70	10	20	200	5	10	10	10	5	20	180
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	78	11	22	222	6	11	11	11	6	22	200
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228			89			742	533	83	547	536	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			89			742	533	83	547	536	225
tC, single (s)	4.8			4.1			7.1	6.5	6.3	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.9			2.2			3.5	4.0	3.4	3.5	4.0	3.6
p0 queue free %	91			99			95	97	99	99	95	73
cM capacity (veh/h)	1008			1519			216	409	944	402	408	743
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	178	250	33	228								
Volume Left	89	22	11	6								
Volume Right	11	6	11	200								
cSH	1008	1519	369	675								
Volume to Capacity	0.09	0.01	0.09	0.34								
Queue Length 95th (m)	2.3	0.4	2.4	11.9								
Control Delay (s)	4.9	0.8	15.7	13.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.9	0.8	15.7	13.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			43.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
4: Concession 11 & Centre Road

2014 PM
South exit at Concession 11 to Centre Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			1%			0%			0%	
Volume (veh/h)	5	50	40	40	60	70	10	70	10	70	120	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	56	44	44	67	78	11	78	11	78	133	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	508	403	136	469	400	83	139			89		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508	403	136	469	400	83	139			89		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	7.1	4.1			5.0		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	4.1	2.2			3.0		
p0 queue free %	98	89	95	89	87	90	99			93		
cM capacity (veh/h)	365	495	892	411	500	786	1457			1111		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	189	100	217								
Volume Left	6	44	11	78								
Volume Right	44	78	11	6								
cSH	595	555	1457	1111								
Volume to Capacity	0.18	0.34	0.01	0.07								
Queue Length 95th (m)	5.1	12.0	0.2	1.8								
Control Delay (s)	12.3	14.8	0.9	3.5								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.3	14.8	0.9	3.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.1									
Intersection Capacity Utilization			40.1%		ICU Level of Service					A		
Analysis Period (min)			15									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			1%			0%	
Volume (veh/h)	5	80	10	90	280	10	10	10	100	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	89	11	100	311	11	11	11	111	6	6	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	322			100			631	628	94	739	628	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	322			100			631	628	94	739	628	317
tC, single (s)	4.1			4.8			7.1	6.5	6.8	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.8			3.5	4.0	3.8	3.5	4.0	3.3
p0 queue free %	100			91			97	97	87	98	98	99
cM capacity (veh/h)	1249			1169			362	366	824	264	366	729
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	422	133	17								
Volume Left	6	100	11	6								
Volume Right	11	11	111	6								
cSH	1249	1169	681	381								
Volume to Capacity	0.00	0.09	0.20	0.04								
Queue Length 95th (m)	0.1	2.2	5.8	1.1								
Control Delay (s)	0.5	2.7	11.6	14.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	2.7	11.6	14.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			41.2%	ICU Level of Service	A							
Analysis Period (min)			15									

Lowndes Property - Traffic Assessment
3: Campbellville Road & Twiss Road

2014 PM
South exit at Concession 11 to Millborough Line



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	70	10	20	200	5	10	10	10	5	20	180
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	78	11	22	222	6	11	11	11	6	22	200
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228			89			742	533	83	547	536	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			89			742	533	83	547	536	225
tC, single (s)	4.8			4.1			7.1	6.5	6.3	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.9			2.2			3.5	4.0	3.4	3.5	4.0	3.6
p0 queue free %	91			99			95	97	99	99	95	73
cM capacity (veh/h)	1008			1519			216	409	944	402	408	743
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	178	250	33	228								
Volume Left	89	22	11	6								
Volume Right	11	6	11	200								
cSH	1008	1519	369	675								
Volume to Capacity	0.09	0.01	0.09	0.34								
Queue Length 95th (m)	2.3	0.4	2.4	11.9								
Control Delay (s)	4.9	0.8	15.7	13.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	4.9	0.8	15.7	13.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			43.2%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	1%			0%	4%	
Volume (veh/h)	80	20	20	50	50	100
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	22	22	56	56	111
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	211	111	167			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	211	111	167			
tC, single (s)	7.2	6.2	4.1			
tC, 2 stage (s)						
tF (s)	4.2	3.3	2.2			
p0 queue free %	86	98	98			
cM capacity (veh/h)	629	948	1424			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	111	78	167			
Volume Left	89	22	0			
Volume Right	22	0	111			
cSH	674	1424	1700			
Volume to Capacity	0.16	0.02	0.10			
Queue Length 95th (m)	4.7	0.4	0.0			
Control Delay (s)	11.4	2.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.4	2.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)			15			