

TRAFFIC IMPACT STUDY VICDOM UTICA PIT

**Township of Uxbridge
Region of Durham**

P/N 12-2630

April, 2014



Prepared for: Vicdom Sand & Gravel Ltd.



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Scott Brumwell, P. Eng.

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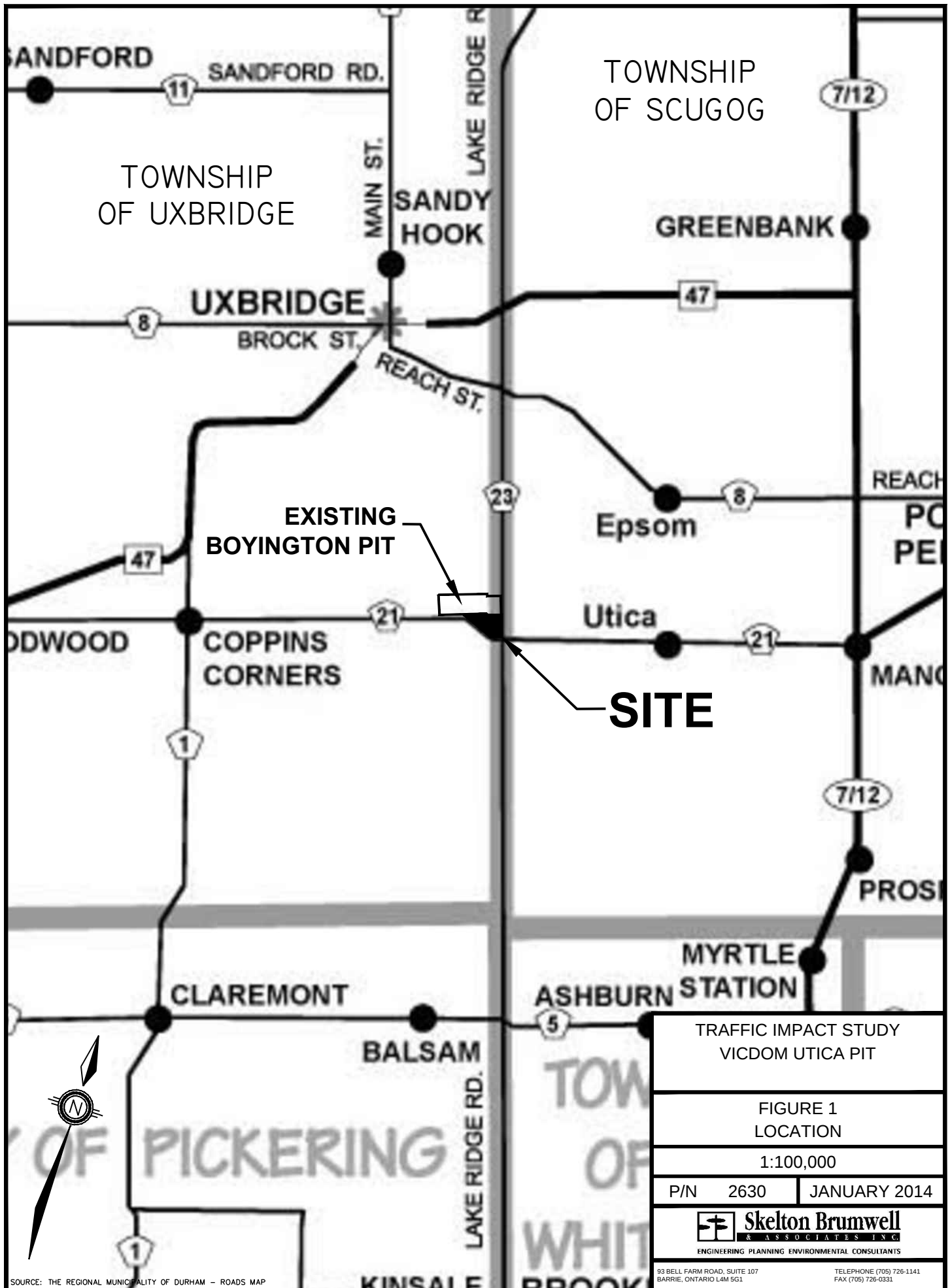
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1.0 INTRODUCTION

Vicdom Sand and Gravel (Ontario) Ltd. (Vicdom) is proposing a new aggregate extraction operation to be located on a 19.2 hectare parcel of land located at the north-west corner of Regional Road 21 (Goodwood Road) and Regional Road 23 (Lake Ridge Road). The site location is shown on Figure 1 on the following page.

The Utica Pit is to be licensed for a maximum annual extraction of 500,000 tonnes and a maximum extraction area of 15.4 hectares. The proposed gravel pit is located immediately south of Miller Paving Limited's Boyington Pit #2 which has an area of 49.31 hectares. The Miller Boyington Pit is licensed for 272,000 tonnes per year and is currently operated by Vicdom. Vicdom intends to continue to operate the Boyington Pit #2 while pursuing approvals for the Utica Pit, and then operate the two gravel pits basically as one operation, sharing aggregate processing facilities and the existing entrance/exit from Goodwood Road. There is not a lot of quality material remaining in the Boyington Pit, so the goal is to basically transition aggregate extraction operations to the new Utica Pit as the available gravel resource in the Boyington Pit is exhausted.

This study is intended to address policies and support applications for amendments to the Region of Durham Official Plan and the Township of Uxbridge Official Plan and Zoning By-law, and the application under the Aggregate Resources Act for licensing of the subject lands.



2.0 CONTEXT

The market area for the proposed Utica Pit is primarily the eastern GTA including Durham Region, southern York Region and the eastern part of Toronto. Primary haul routes from the pit are shown on Figure 2- Haul Routes. Traffic from the pit will travel either east or west along Goodwood Road. Going east, most of the trucks would turn south on Lake Ridge Road towards Whitby and Oshawa, although a small numbers of trucks could travel north to Uxbridge or continue east toward Port Perry. Much of the traffic heading west would likely turn south on Brock Road which provides access to Highways 407 and 401 as well as Pickering and Ajax. Markets in York Region would be accessed by continuing westward to Goodwood and Regional Road 47. All of these roads are designated Type “A” Arterial Roads, and are part of the “Strategic Goods Movement Network” in the Durham Region Official Plan, 2008.

The proposed Utica pit will share the existing entrance into the Miller Boyington Pit #2, which is located about 900 metres west of Lake Ridge Road. The existing driveway is about 8 to 9 metres wide and has an asphalt surface for a distance of about 7 metres and is then gravel. There are no auxiliary turning lanes on Goodwood Road at this location which has a posted speed limit of 80 km/hr. Goodwood Road has an asphalt width of about 8 metres (3.6 metres lanes plus 0.4 metre paved shoulders) combined with gravel shoulders that are about 3.0 metres wide. In areas where there are guardrails present, the shoulder width is reduced to about 2 metres. A steel guardrail is present on the north side of Goodwood Road to the west side of the pit entrance, which terminates part way along the radius on the west side of the driveway. The measured sight distances at this location are about 280 metres to and from the east, and about 1.2 km to and from the west.

Signage is provided in both directions warning of both the entrance location and the presence of trucks entering the roadway.

Staff from the Region of Durham Traffic Department have advised that there is no record of any collisions occurring at the pit entrance for the past three years.

The intersection of Goodwood Road and Lake Ridge Road is fully signalized, with left turn lanes in all directions. For southbound traffic on Lake Ridge Road there is a channelized right turn lane which merges traffic onto Goodwood Road westbound.

3.0 TRAVEL DEMAND

3.1 Horizon Year and Time Period of Analysis

It is assumed for the purposes of this study that the new gravel pit license will be approved in 2014. A study horizon of 10 years to 2024 has been used.

3.2 Historic Traffic Volumes

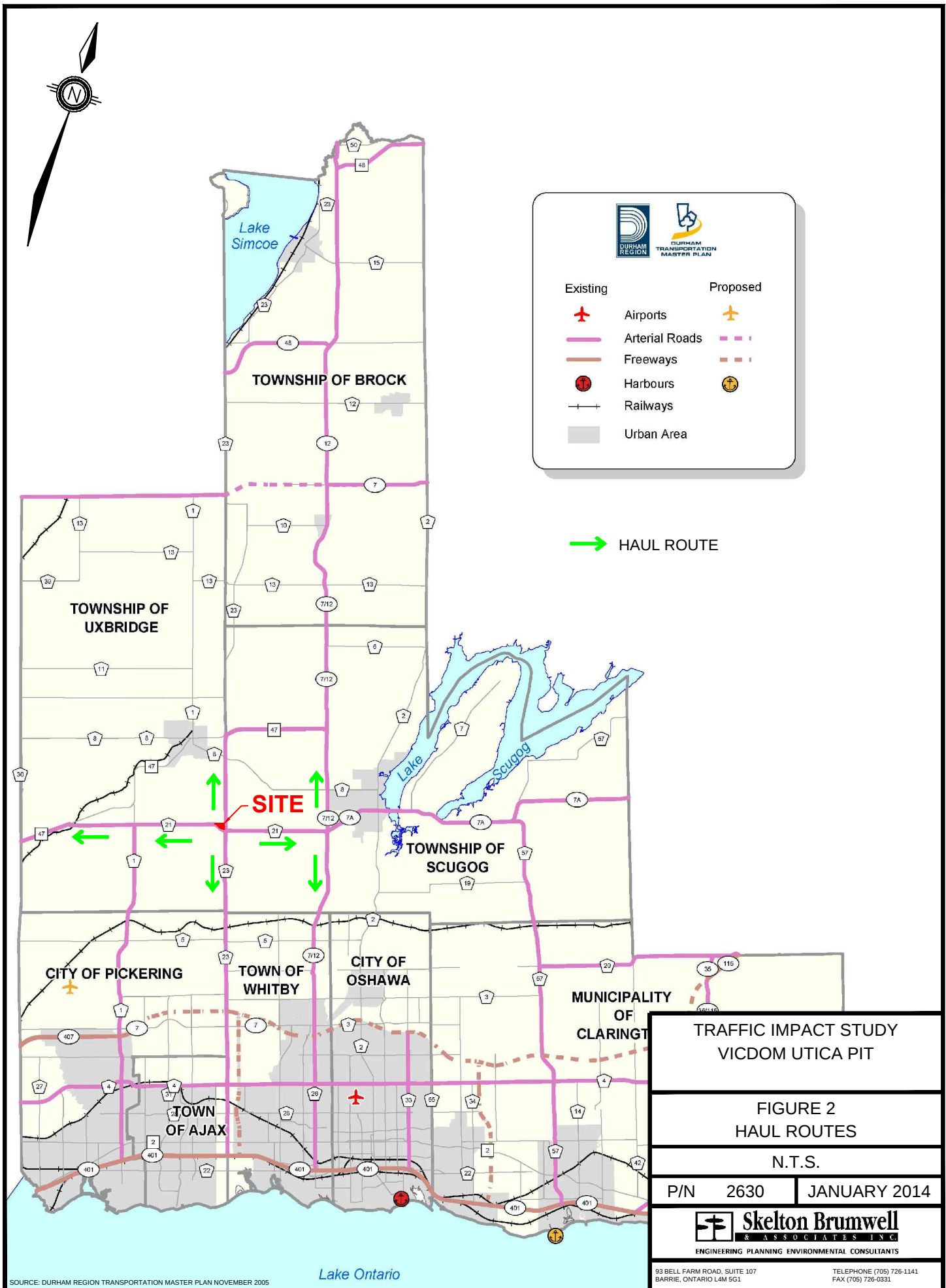
The Region of Durham provides Average Annual Daily Traffic (AADT) volumes for Regional Roads on its web site. The AADT's for Goodwood Road and Lake Ridge Road are shown on Table 1 and included in Appendix A. The traffic count location for Goodwood Road (Station #2103) is 200 metres west of Lake Ridge Road, while the Lake Ridge Road count location (Station #2304) is 300 metres north of Goodwood Road.

The annual rate of change in the AADT's for Goodwood and Lake Ridge Roads varied widely between 2001 and 2012, including some years where the change was negative. As shown in Table 1, the average annual growth for the data set was 3.1% for Goodwood Road and 2.2% for Lake Ridge Road. As a comparison, the population of the Township of Uxbridge increased from 17,177 in 2001 to 20,623 in 2011, which works out to 1.7% per year.

Population, and therefore traffic volume, has grown faster in the Durham Region urban areas such as Pickering, Ajax, Whitby and Oshawa than in the rural area in the vicinity of the site. The "Growth Plan for the Greater Golden Horseshoe, 2006", prepared under the *Places to Grow Act 2005*, directs that future population growth in Durham be concentrated in the urban centres along Lake Ontario. Therefore, the increase in traffic volume on Goodwood Road in this rural area will continue to be less than in the urban areas to the south. For analysis purposes, it is assumed that the AADT for Goodwood Road at the site entrance will increase by an average of approximately 2.5% through the study period which is in line with historical traffic and population increases.

Table 1 – Historic Traffic Volumes

Year	Goodwood Road	Lake Ridge Road
2001		4680
2002	7460	4460
2003	7880	4990
2004	9030	5210
2005	9190	5690
2007	9610	5970
2008	9750	5700
2009	9910	5750
2010	9870	5980
2011	9760	5790
2012	10140	5940
Average Annual Increase	3.1%	2.2%



3.3 Detailed Traffic Counts

Detailed traffic count information was obtained from the Region of Durham for the Goodwood Road traffic count station and for the signalized intersection of Goodwood Road and Lake Ridge Road. The Goodwood Road data was used to arrive at the 2012 AADT listed in Table 1, and includes count data for May 3, August 9 and October 11, 2012. The intersection counts were obtained on April 23, 2013. This data is included in Appendix A.

The detailed count data for Goodwood Road shows an average peak AM hour traffic volume (for the three traffic count dates) of 709 vehicles, or 7.0% of the 2012 AADT, occurring between 7:15 and 8:15 am. The average PM peak hour traffic volume was 899 vehicles or about 8.9% of the AADT, which occurred between 4:30 and 5:30 p.m. For the period from 3:00 to 4:00 p.m., the average traffic volume was 728 vehicles, which is about 7.2% of the AADT. This time period is critical as it is expected that most of the shipping of materials from the pit will be done by 4:00.

Looking at the 2013 intersection count data, the two-way AM peak hour traffic volume entering and exiting the west leg (Goodwood Road) was 791 vehicles which is about 7.8% of the 2012 AADT. If the 2012 AADT is factored up by 2.5% to 2013, that percentage would drop to 7.6%. Similarly, the total PM peak hour traffic volume for the west leg was 974 vehicles. This is about 9.6% of the 2012 AADT, or about 9.4% of the theoretical 2013 figure. This data also provides an indication of the directional split on Goodwood Road. For the AM peak hour, the split was 70% westbound and 30% eastbound. In the PM peak hour, it was 30.2% westbound and 69.8% westbound. From 3:00 to 4:00 the split was about 42% westbound and 58% eastbound. In looking at only the truck traffic, the truck volumes at the west leg were 45.4% westbound / 54.6% eastbound in the AM peak hour and 45.6% eastbound / 54.4% westbound in the PM peak hour.

3.4 Projected Background Traffic

Based on an average growth in traffic volume of 2.5%, the future traffic volumes on Goodwood Road are shown in Tables 2, 3 and 4.

For analysis purposes, it is assumed that the A.M. peak hour volume will be 7.3% of the daily volume, the P.M. peak hour will be 9.2% of the daily volume, and the volume from 3:00 to 4:00 in the afternoon will be 7.2% of the daily volume. Furthermore, the directional splits are assumed to be 70% westbound, 30% eastbound in the A.M. peak hour, 30% westbound, 70% eastbound in the P.M. peak hour and 40% westbound, 60% eastbound between 3:00 and 4:00.

Table 2 – Projected Background Traffic Volumes (A.M. Peak Hour)

Goodwood Road						
Location	Year	AADT Annual Increase 2.5%	Peak Hour % of AADT	Volume	Westbound 70%	Eastbound 30%
Pit Entrance	2012	10,140	7.3%	740	518	222
	2014	10,653	7.3%	778	544	233
	2024	13,637	7.3%	996	697	299

Table 3 – Projected Background Traffic Volumes (P.M. Peak Hour)

Goodwood Road						
Location	Year	AADT Annual Increase 2.5%	Peak Hour % of AADT	Volume	Westbound 30%	Eastbound 70%
Pit Entrance	2012	10,140	9.2%	933	280	653
	2014	10,653	9.2%	980	294	686
	2024	13,637	9.2%	1,255	377	878

Table 4 – Projected Background Traffic (3:00 to 4:00 p.m.)

Goodwood Road						
Location	Year	AADT Annual Increase 2.5%	Peak Hour % of AADT	Volume	Westbound 40%	Eastbound 60%
Pit Entrance	2012	10,140	7.2%	730	292	438
	2014	10,653	7.2%	767	307	460
	2024	13,637	7.2%	982	393	589

3.5 Site Generated Traffic

3.5.1 Traffic Volume

Traffic volumes for the proposed operation were calculated based on the operational and transportation information provided by the Bruno Giordano of Vicdom Sand and Gravel.

The amount of material shipped from the site will vary from year to year depending on market conditions. However, it cannot exceed the maximum tonnage permitted by the Licence under the Aggregate Resources Act, which is 500,000 tonnes. The annual average production is estimated to be 250,000 Tonnes. Calculations for both the average and maximum tonnage are included in Appendix B.

Eighty percent of the annual tonnage is likely to be shipped from May 1st to November 30th each year due to reduced demand in the winter. The traffic generated by the operation is, and will continue, to be comprised primarily of trucks transporting the aggregate products from the pit to customers, with relatively small numbers of employee and service vehicles.

The truck traffic generated by gravel pits tends to be distributed relatively evenly throughout the day. While the hours of operation for the pit are between 6:00 and 7:00 pm, for the purposes of this analysis it is assumed that 90% of the daily volume will be shipped during the 10 hour period between 6:00 am and 4:00 pm. Vicdom advises that typically not very much product is shipped after 4:00. This is an important factor as the observed P.M. Peak Hour of Goodwood Road was 4:30 to 5:30 p.m.

The traffic volume from the proposed pit is calculated to be 102 vehicles per day or 9 vehicles per hour at the average annual production of 250,000 tonnes and 204 vehicles per day or 18 vehicles per hour at the maximum annual production of 500,000 tonnes. Allowing for an hourly peaking factor of 1.5, there could be a peak volume of 14 vehicles per hour based on average production and 27 vehicles based on maximum production.

3.5.2 Directional Distribution

Based on current markets, the current and predicted directional distribution of traffic is 50% to and from the west and 50% to and from the east. For ease of analysis, the hourly traffic volumes were rounded up to allow for an even number of vehicle movements in each direction. The estimated peak hour traffic volumes for average and maximum production with directional distribution are therefore as follows:

Average Production: 16 trips per hour (instead of 14 estimated)
4 trucks turning in from east (right)
4 trucks turning in from west (left)
4 trucks turning out to east (left)
4 trucks turning out to west (right)

Maximum Production: 28 trips per hour (instead of 27 estimated)
7 trucks turning in from east (right)
7 trucks turning in from west (left)
7 trucks turning out to east (left)
7 trucks turning out to west (right)

4.0 EVALUATION OF IMPACTS

4.1 Methodology

The intersection of the pit entrance with Goodwood Road was evaluated using the method described in the Highway Capacity Manual¹ in order to determine the expected Level of Service for both existing and future traffic conditions. The level of service definitions area included in Appendix C. The traffic software program “HCS +” by McTrans was used to carry out the calculations.

The objective of the analysis is to identify "problem" intersections and traffic movements. For rural areas, "problem" intersections and movements are typically defined as those where a Level of Service “D” is incurred, meaning that motorists attempting to turn at intersections would experience longer delays.

Generally, traffic impacts should be mitigated when site generated traffic creates or worsens a "problem" situation.

4.2 Analysis

The calculations sheets from the HCS+ analysis can be found in Appendix D. Tables 5 and 6 show the results of the HCS+ calculations for the entrance driveway, for both the 2014 and 2024 background traffic conditions.

At unsignalized intersections, the Level of Service analysis is specific to traffic that has to come to a stop at an intersection. For example, at the gravel pit driveway, it applies only to the eastbound traffic turning left from Goodwood Road, and traffic turning left or right out of the site.

¹ Highway Capacity Manual 2000@ Transportation Research Board, National Research Council, Washington, D.C., 2000.

Table 5 – Level of Service at Gravel Pit Driveway - 2014

Time	Direction	Turn	Average Production		Maximum Production	
			Delay (s)	L.O.S.	Delay (s)	L.O.S.
A.M. Peak	Eastbound (entering)	Left	10.7	B	10.8	B
A.M. Peak	Southbound (exiting)	Left / Right	19.4	C	18.9	C
P.M. Peak	Eastbound (entering)	Left	9.4	A	9.5	A
P.M. Peak	Southbound (exiting)	Left / Right	20.9	C	21.4	C
3 – 4 p.m.	Eastbound (entering)	Left	9.5	A	9.5	A
3 – 4 p.m.	Southbound (exiting)	Left / Right	17.1	C	17.5	C

Table 6 – Level of Service at Gravel Pit Driveway - 2024

Time	Direction	Turn	Average Production		Maximum Production	
			Delay (s)	L.O.S.	Delay (s)	L.O.S.
A.M. Peak	Eastbound (entering)	Left	11.8	B	11.8	B
A.M. Peak	Southbound (exiting)	Left / Right	23.9	C	24.7	C
P.M. Peak	Eastbound (entering)	Left	9.9	A	9.9	A
P.M. Peak	Southbound (exiting)	Left / Right	29.7	D	30.9	D
3 – 4 p.m.	Eastbound (entering)	Left	10.0	A	10.0	A
3 – 4 p.m.	Southbound (exiting)	Left / Right	21.7	C	22.4	C

From Tables 5 and 6, it can be seen that the Level of Service for vehicles turning left into the pit is acceptable, with Level B being experienced in the A.M. Peak hour and Level A in both the P.M. Peak hour and from 3:00 to 4:00 p.m., or 2014 and 2024.

Trucks exiting the pit will be subject to some delays during peak hours. For 2014 these delays result in a Level of Service C, however for 2024 the delays increase and for the P.M. peak hour it could be over a 30 second wait (Level of Service D) to turn onto Goodwood Road. As the P.M. Peak hour was found to occur from around 4:30 to 5:30, there is not anticipated to be very much

gravel pit traffic during that period as most of the hauling will be done by 4:00. For the period of 3:00 to 4:00 p.m., the delays are anticipated to be more reasonable, being a bit less than what would occur in the A.M. Peak hour with a Level of Service C. This shows the importance of generally minimizing the hauling of materials during the afternoon rush hour.

The data in Tables 5 and 6 also shows that the increases in the calculated delays are higher due to the increase in background traffic than they are due to the increase in gravel pit traffic. In other words, there is a greater increase in the delays going from 2014 to 2024 background conditions than there is going from the average to maximum production year traffic generation.

4.3 Turning Lane Warrants

As per Section 3.5.2, it is expected that there could be up to about 14 trucks per hour turning into the gravel pit driveway from Goodwood Road, 7 from the east and 7 from the west.

For westbound traffic that would be turning right into the entrance, 7 trucks represents only about 1.0% of the 2024 advancing traffic volume in the morning peak hour, and about 1.9% of the 2024 volume in the P.M. peak hour. The Ontario Ministry of Transportation does not have any warrants for when right turn treatments are required, however per Cottrell² (1982), turning lanes are not required until the turning volume is at least 40 vehicles per hour, and a taper isn't recommended until the volume reaches 20 vehicles per hour. On this basis it is concluded that a right turn lane or taper is not warranted.

Looking at the eastbound, left turning traffic, 7 trucks per hour is about 2.3% of the advancing volume (2024) in the P.M. peak hour, and 0.8% of the advancing volume in the A.M. peak hour. The Ministry of Transportation's warrant graphs are applicable for when the turning volume is at least 5% of the advancing volume. It is therefore concluded that a left turn lane is not warranted at this location.

4.4 Sight Distance Considerations

With a posted speed limit of 80 km/hr, a reasonable design speed in a rural area such as this would be 100 km/hr. Because the driveway is located towards the west end of a horizontal

² Cottrell, B.H. JR, Guidelines for Treatment of Right-turn Movements on Rural Roads, Transportation Research 855, 1982.

curve, it is our opinion that a design speed of 90 km/hr could be considered for traffic approaching from the east.

As noted in Section 2.0, the measured sight distance is about 280 metres to and from the east, and about 1.2 km to and from the west. Sight distance to and from the driveway for vehicles approaching from the west will not be a problem given the long available sight line.

For vehicles approaching from the east, the minimum requirement is that the available sight distance should exceed the minimum Stopping Sight Distance criteria as described in the Ministry of Transportation Geometric Design Standards for Ontario Highways. For a design speed of 90 km/hr the Minimum Stopping Sight Distance is 160 metres, so the measured sight distance of 280 metres exceeds this value. It also exceeds the Stopping Sight Distance for 100 km/hr which is 185 metres. We would therefore consider this intersection to be safe.

5.0 CONCLUSIONS

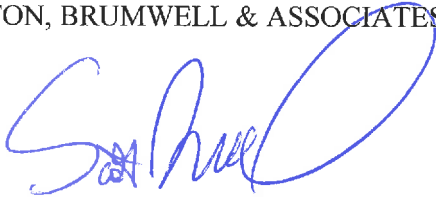
Based on our research and analysis, we conclude the following:

- At the maximum licensed tonnage for the proposed aggregate extraction operation, the proposed Vicdom Utica gravel pit is expected to generate an average of 204 trips per day from May to November. It is estimated that this volume could result in a peak hour volume of up to 27 trips per hour (14 in / 14 out).
- It is expected that the truck traffic generated by the pit will generally be distributed fairly evenly to the west and east as most of the material will be delivered to current markets in the southern Durham Region and eastern GTA areas.
- Traffic to and from the pit will primarily use Regional Roads and Provincial Highways that are part of the Strategic Goods Movement Network in the Region.
- Trucks turning into the gravel pit driveway from Goodwood Road are expected to be able to do so without experiencing any unreasonable delays, both in the existing (2014) and future (2024) background traffic conditions.
- Trucks turning out of the driveway will be subject to some delays in the morning peak hour and later in the afternoon, however at a Level of Service C the delays will not be unreasonable.
- Delays for trucks turning from the driveway will be longer in the P.M. peak hour, especially in the 2024 background traffic condition, so it is recommended that aggregate shipping be minimized after about 4:00 to 4:30 pm.

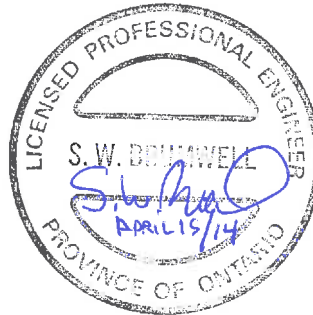
- The volume of trucks turning into the gravel pit is not sufficient to warrant any auxiliary turning lanes on Goodwood Road.
- The available sight distance where the existing driveway intersections with Goodwood Road exceeds the Ministry of Transportation's minimum requirement for Stopping Sight Distance so the intersection is considered safe.

All of which is respectfully submitted,
SKELTON, BRUMWELL & ASSOCIATES INC.

per:



Scott W. Brumwell, P.Eng.
Vice President



APPENDIX A
Traffic Count Information

TRANSPORTATION STUDIES AND DATA A.A.D.T. PROGRAM

STATION	LOCATION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1604	100 m. N. of Bond St.	18320	17230			18790	19682	20430	21800	20250	19130	19620	21030
1605	60 m. S. of King St.	(*)	21140	19500		21410	20395	23830	22640	21670	20420	21210	21770
1606	80 m. N. of Beatrice St. E.					18610	18619	21320	20600	20540	18860	19520	21420
1607	200 m. N. of Wentworth St. (R.R. 60)						10784	11190	10500	9890	8680	9480	9770
	Main St./Manvers St./Mill Street (R.R. 17)												
1701	500 m. S. of Taunton Rd. (R.R. 4)		1730	2210	2160	2010	1848	1960	1900	1880	1860	1840	1850
1702	200 m. N. of Hwy. 35/115		2110	2480	2440	2380	2294	2650	2600	2640	Const.	Const.	1200
1703	500 m. S. of Hwy. 35/115	2560	2420	3000	3290	2960	2857	3180	3000	2950	3250	3350	3490
1704	200 m. N. of Hwy. 401	4200	4460	5620	5950	6290	6422	7970	7300	6700	7490	7990	8150
	Newtonville Road (R.R. 18)												
1801	500 m. N. of Concession Rd. 4		790	940	930	970	840	950		930	1050	1040	1370
1802	100 m. S. of Regional Hwy. 2	1950	1450	1840	1840	1880	1877	1880	1800	1880	2030	2290	2130
	Shirley Road (R.R. 19)												
1901	300 m. E. of Simcoe St. (R.R. 2)		1920	2310	2620	2140	1981	2370		2250	2270	2400	2310
1902	500 m. W. of Old Scugog Rd.	D	1140	1540	1630	1280							
	Mosport Road (R.R. 20)												
2001	500 m. E. of Regional Rd. 57	D	2910	2860	4000								
2002	600 m. E. of Liberty St.		2940	3070	3480	3960	2148	4070		4930	4380	4470	4340
2003	400 m. W. of Hwy. 35		3060	2500	3220	3680	3088	3450		3900	3850	4120	4240
	Goodwood Road (R.R. 21)												
2101	200 m. W. of Regional Rd. 1		6100	6520	6660	7190	5971	8660	8400	8350	8830	8380	8960
2102	200 m. E. of Regional Rd. 1		8860	7920	9150	9600	7718	10230	9800	10470	11050	10520	11440
2103	200 m. W. of Lake Ridge Rd. (R.R. 23)		7460	7880	9030	9190	7617	9610	9750	9910	9870	9760	10140
2104	900 m. W. of Hwy. 12 (Manchester)		9640	9640	9990	10590	8881	10570	10000	10100	9800	10400	11970
	Bayly St./Victoria St./Bloor Street (R.R. 22)												
2201	200 m. W. of Liverpool Rd. (R.R. 29)	18940	16240	20760	21620	20290	20111	18990	19650	19600	19200	19840	19410
2202	Immediately E. of Krosno Blvd.	(*)	21420	20420	23930	23650	21242	23090	23600	23620	23330	24350	23890
2203	200 m. E. of Brock Rd. (R.R. 1)		25870	20500	28570	27150	26841	26390	26400	Const.	26370	28130	28440
2204	400 m. W. of Westney Rd. (R.R. 31)		39160	38960			26764	27830	27200	27220	27060	26600	25770
2205	200 m. W. of Harwood Ave. (R.R. 44)	(*)	21520	24890	29510	31140	29603	29830	29500	29270	29730	29380	30530
2207	200 m. W. of Lake Ridge Rd. (R.R. 23)		15710	21050	20890	20910	17868	20350	22600	Const.	Const.	Const.	20540
2208	200 m. E. of Lake Ridge Rd. (R.R. 23)		11620	13970	16130	16580	14480	16780	16230	16890	17420	17200	17460
2209	200 m. W. of Henry St. (R.R. 45)		17880	19420	25260		22603	23440	23400	23360	25330	25200	25420
2210	200 m. E. of Brock St. (R.R. 46)		10880	11280	14580	14860	12985	14280	13820	12900	13290	12790	14380
2211	200 m. W. of Thicksen Rd. (R.R. 26)		19210	17770	20100	21010	21650	18740	20850	19330	19340	20000	17360
2212	300 m. E. of Thicksen Rd. (R.R. 26)		10620	11680	16620	17580	18090	19428	17190	15600	15130	15620	Const. 13510
		D until											
2213	500 m. W. of Stevenson Rd. (R.R. 53)	2010	10050	15260	18240	19150					19160	18750	20150
2214	150 m. E. of Park Rd. S. (R.R. 54)	D	14490	14760	14760			18070	18880	17450	17430	18450	18490
2215	250 m. W. of Wilson Rd. (R.R. 35)		11850	10890	13400	13080	11743	13480	13640	12750	13770	13450	12850
2216	200 m. E. of Harmony Rd. (R.R. 33)		14010	12950	15700	16080	16538	17320	17340	16850	16920	16790	17600

TRANSPORTATION STUDIES AND DATA A.A.D.T. PROGRAM

STATION	LOCATION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
2217	100 m. W. of West Shore Blvd.	13450	12160	14130	14740	14280	13278	14190	14500	14770	13890	14300	14110
2218	100 m. W. of Hwy. 401 (Ramp 416)	D until 2012	22560	18300	17830	26000							
2219	100 m. E. of Simcoe St. S. (R.R.2)		15880	14860	19180	18840	17893	20580	21000	20700	20320	20720	Const.
2220	200 m. W. of Oshawa Townline		8250			11200	11373	12440	13000	12340	12860	13010	13680
2221	100m E. of Burcher Rd.			22250	23980						24970	25570	25850
2222	200 m. W. of Courtoice Rd. (R.R. 34)						4323	4360	4400	5200	5020	5200	5790
Lake Ridge Road (R.R. 23)													
2301	Immediately N. of Victoria St. (R.R. 22)	6570	7360	9090	9290	8680	7033	8670	8740	8660	8940	9120	9590
2302	300 m. N. of Hwy. 7	7350	8050	9310	9350	9330	7610	9700	9000	9460	10160	10150	9460
2303	300 m. S. of Uxbridge/Scugog Townline	6880	7760	8440	9400	9190	7724	9380	8400	8850	9180	9370	8280
2304	300 m. N. of Goodwood Rd. (R.R. 21)	4680	4460	4990	5210	5690	4712	5970	5700	5750	5980	5790	5940
2305	300 m. N. of Hwy. 47	5130	4910	5310	5640	5910						6400	7150
2306	300 m. S. of Regional Rd. 13		4720	4820	5420	4860	4187	5810		5240	5470	5940	6060
2307	200 m. S. of Regional Rd. 10	3780	3430	4100	4460	3960	3671	4810		4500	4530	4940	5050
2308	200 m. N. of Regional Rd. 10	1640	1750	1940	2100	1960	1557	1860		2040	2030	2270	2260
2309	500 m. N. of York R. R. 82 (Conc. 9)	2720	2860	3290	3550	3630	2514	3150		3120	3120	3370	3020
2310	300 m. N. of Hwy. 48		4120	4620	4660	4840						4650	4440
2311	1.7 km. S. of Regional Rd. 15		3820	4620	4690	4910	4265	5180		5000	4880	4990	4780
2312	60 m. N. of Regional Rd. 15	4510	5210	5740	5780	7530	6699	6990		6570	6260	5620	5740
2313	200 m. N. of Taunton Rd. (R.R. 4)	8130	8560	11230	11850	11950	9871	12510	12000	11460	13350	13750	12480
2314	500 m. S. of Shoreline Rd. (R.R. 47)		2610	3170	3260	3050	2666	3060		2400	2370	2260	2380
2315	300 m. S. of York R.R. 32 (Ravenshoe Rd.)		1600	1800	1960	1810						2190	2120
2317	300 m. W. of Hwy. 12/48	1900	1560	1990	2060	1890	1739	1940		1980	1870	1640	1520
2318	200 m. S. of Taunton Rd. (R.R. 4)	8690	8760	11470	13050	12940	12190	14220	13500	12900	14630	14960	14520
2320	300 m. S. of Rossland Rd.						11919	17480	15200	14550	15400	15270	15710
Church Street (R.R. 24)													
2403	75 m. S. of Randall Dr./Lincoln St.	D	9020	10860									
2404	200 m. N. of Bayly St. (R.R. 22)	8650	8370	9540	9700	9620	8473	10100	10000	10400	10140	10200	9960
Champlain Avenue/Consumers Drive (R.R. 25)													
2501	100 m. E. of Hopkins St. (R.R. 36)	18840	16650				18413	18220	18000	18740	19050	19260	16840
2502	300 m. E. of Thickson Rd. (R.R. 26)	8090	8420			10340	15914	9580	10300	10980	10860	11070	10230
2503	50 m. E. of Brock St. (Hwy. 12)	(*)	19670	19610	27350	28540	27169	27460	27500	26800	27190	27330	27600
2504	150 m. E. of Hwy. 401 (Ramp 410)	(*)				25290	24023	25050	26210	24600	25080	27440	26460
2505	200 m. W. of Hopkins St. (R.R. 36)	(*)	13270	13660	16460						18850	18930	
Thickson Road (R.R. 26)													
2601	300 m. S. of Hwy. 7/12	4810	5420	6554	6950	6290	5147	6410	6880	6320	6670	6530	6870
2602	200 m. S. of Winchester Rd. (R.R. 3)	8700	10320	11680	12630	12690	11411	13500	13500	13610	14310	14230	14510
2603	350 m. S. of Taunton Rd. (R.R. 4)	14590	16070	17020	18550	21090	19008	23220	22750	22300	22860	22420	24460
2604	200 m. S. of Rossland Rd. (R.R. 28)	(*)	26260	21040	26150	26580	25562	29500	27810	27830	28300	Const.	26660
2605	300 m. S. of Dundas St./Hwy. 2	(*)	31480	29880	32720	31860	29845	33710	32200	30800	31130	29800	28680

Vicdom - Utica Pit
Township of Uxbridge
Summary of ATR Count Data from Region of Durham

Morning

Time Start	30-Apr	06-Aug	08-Oct	Average	Hourly Total	% of AADT	Comment
6:00	147	138	115	133			
6:15	140	147	135	141			
6:30	131	163	132	142			
6:45	193	132	155	160	576		
7:00	149	160	159	156	599		
7:15	196	192	183	190	648		
7:30	177	178	168	174	681		
7:45	161	197	193	184	704		
8:00	156	179	146	160	709	7.0%	A.M. Peak Hour
8:15	179	188	188	185	703		
8:30	144	136	165	148	677		
8:45	154	168	136	153	646		
9:00	137	135	108	127	613		
9:15	142	153	135	143	571		
9:30	136	125	98	120	542		
9:45	100	135	144	126	516		
10:00	111	116	133	120	509		

Afternoon

Time Start	30-Apr	06-Aug	08-Oct	Average	Hourly Total	% of AADT	Comment
2:00	126	131	159	139			
2:15	123	161	151	145			
2:30	142	155	192	163			
2:45	166	159	189	171	618		
3:00	136	145	191	157	637		
3:15	157	168	179	168	660		
3:30	174	189	203	189	685		
3:45	202	195	246	214	728	7.2%	3:00 to 4:00 p.m.
4:00	209	217	206	211	782		
4:15	201	175	243	206	820		
4:30	213	249	229	230	862		
4:45	223	220	223	222	869		
5:00	240	220	219	226	885		
5:15	237	210	214	220	899	8.9%	P.M. Peak Hour
5:30	233	200	211	215	883		
5:45	187	165	206	186	847		
6:00	174	187	161	174	795		

Note: 2012 ADT is 10,140 vehicles per hour

ATR Counts Report

GOODWOOD RD (RR 21) - Uxbridge W of LAKE RIDGE RD (RR 23)

ATR No:		2103		Affiliated PCS No:		101		Start Date:		2012/1/1		End Date:		2012/12/31		
Start Time	30-Apr-12		Tue		Wed		Thu		Fri		Sat		Sun		Average Day	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00							22	100							22	100
12:15							22	118							22	118
12:30							19	134							19	134
12:45							17	110							17	110
01:00							21	141							21	141
01:15							13	128							13	128
01:30							14	124							14	124
01:45							9	147							9	147
02:00							10	126							10	126
02:15							16	123							16	123
02:30							10	142							10	142
02:45							13	166							13	166
03:00							13	136							13	136
03:15							11	157							11	157
03:30							15	174							15	174
03:45							10	202							10	202
04:00							33	209							33	209
04:15							28	201							28	201
04:30							34	213							34	213
04:45							34	223							34	223
05:00							60	240							60	240
05:15							78	237							78	237
05:30							102	233							102	233
05:45							104	187							104	187
06:00							147	174							147	174
06:15							140	168							140	168
06:30							131	166							131	166
06:45							193	149							193	149
07:00							149	92							149	92
07:15							196	96							196	96
07:30							177	94							177	94
07:45							161	85							161	85
08:00							156	79							156	79
08:15							179	89							179	89
08:30							144	69							144	69
08:45							154	81							154	81
09:00							137	62							137	62
09:15							142	69							142	69
09:30							136	50							136	50
09:45							100	48							100	48
10:00							111	52							111	52
10:15							128	34							128	34
10:30							106	48							106	48
10:45							130	35							130	35
11:00							111	29							111	29
11:15							135	24							135	24
11:30							109	26							109	26
11:45							120	23							120	23
Total							4100	5813							4100	5813
Day Total								9913								9913
% Splits							41.4%	58.6%							41.4%	58.6%
Peak Vol.							07:15	04:30							07:15	04:30
P.H.F.							690	913							690	913
							0.88	0.95							0.88	0.95

ATR Counts Report

GOODWOOD RD (RR 21) - Uxbridge W of LAKE RIDGE RD (RR 23)

ATR No:		2103		Affiliated PCS No:		101		Start Date:		2012/1/1		End Date:		2012/12/31		
Start Time	6-Aug-12		Tue		Wed		Thu		Fri		Sat		Sun		Average Day	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00							24	145							24	145
12:15							23	144							23	144
12:30							11	124							11	124
12:45							17	132							17	132
01:00							21	143							21	143
01:15							23	153							23	153
01:30							13	158							13	158
01:45							16	140							16	140
02:00							11	131							11	131
02:15							7	161							7	161
02:30							20	155							20	155
02:45							5	159							5	159
03:00							13	145							13	145
03:15							13	168							13	168
03:30							15	189							15	189
03:45							11	195							11	195
04:00							15	217							15	217
04:15							29	175							29	175
04:30							20	249							20	249
04:45							39	220							39	220
05:00							54	220							54	220
05:15							77	210							77	210
05:30							94	200							94	200
05:45							122	165							122	165
06:00							138	187							138	187
06:15							147	164							147	164
06:30							163	131							163	131
06:45							132	122							132	122
07:00							160	105							160	105
07:15							192	106							192	106
07:30							178	85							178	85
07:45							197	86							197	86
08:00							179	86							179	86
08:15							188	77							188	77
08:30							136	71							136	71
08:45							168	59							168	59
09:00							135	78							135	78
09:15							153	60							153	60
09:30							125	66							125	66
09:45							135	51							135	51
10:00							116	48							116	48
10:15							127	53							127	53
10:30							146	39							146	39
10:45							137	37							137	37
11:00							151	34							151	34
11:15							149	34							149	34
11:30							142	25							142	25
11:45							191	29							191	29
Total							4378	5931							4378	5931
Day Total							10309								10309	
% Splits							42.5%	57.5%							42.5%	57.5%
Peak Vol.							07:15	04:30							07:15	04:30
P.H.F.							746	899							746	899
							0.95	0.90							0.95	0.90

ATR Counts Report

GOODWOOD RD (RR 21) - Uxbridge W of LAKE RIDGE RD (RR 23)

ATR No:		2103		Affiliated PCS No:		101		Start Date:		2012/1/1		End Date:		2012/12/31		
Start Time	8-Oct-12		Tue		Wed		Thu		Fri		Sat		Sun		Average Day	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00							19	155							19	155
12:15							17	133							17	133
12:30							21	150							21	150
12:45							16	133							16	133
01:00							17	124							17	124
01:15							13	166							13	166
01:30							16	142							16	142
01:45							12	158							12	158
02:00							16	159							16	159
02:15							20	151							20	151
02:30							8	192							8	192
02:45							5	189							5	189
03:00							15	191							15	191
03:15							15	179							15	179
03:30							17	203							17	203
03:45							16	246							16	246
04:00							15	206							15	206
04:15							28	243							28	243
04:30							19	229							19	229
04:45							31	223							31	223
05:00							49	219							49	219
05:15							77	214							77	214
05:30							95	211							95	211
05:45							113	206							113	206
06:00							115	161							115	161
06:15							135	188							135	188
06:30							132	125							132	125
06:45							155	118							155	118
07:00							159	100							159	100
07:15							183	119							183	119
07:30							168	89							168	89
07:45							193	69							193	69
08:00							146	70							146	70
08:15							188	93							188	93
08:30							165	59							165	59
08:45							136	76							136	76
09:00							108	54							108	54
09:15							135	70							135	70
09:30							98	64							98	64
09:45							144	40							144	40
10:00							133	40							133	40
10:15							117	39							117	39
10:30							126	32							126	32
10:45							113	27							113	27
11:00							121	31							121	31
11:15							141	31							141	31
11:30							145	26							145	26
11:45							114	17							114	17
Total							4040	6160							4040	6160
Day Total							10200								10200	
% Splits							39.6%	60.4%							39.6%	60.4%
Peak Vol.							07:00	04:15							07:00	04:15
P.H.F.							703	914							703	914
							0.91	0.94							0.91	0.94

TMC Tabular Report

GOODWOOD RD (R.R.21) @ LAKE RIDGE RD (R.R.23)

Count Date: 4/23/2013

Count ID: 27922013113

Intersection ID: 1913

TMC No.: 0210100000

AM Peak: 7:45 am Ped. 0 Trucks % Cars Trucks PHF 0.59 5% 1 19 0.90 6% 13 224 0.69 2% 1 66 0.65 74% 35 47 0.91 16% 21 131 0.82 5% 3 59 PHF Trucks Cars Trucks % → Ped. 0									
Ped. 0 Trucks % Cars Trucks PHF 197 41 3 7% 0.60 130 8 6% 0.83 114 7 6% 0.84 403 0 Ped. ↑									

PM Peak: 4:45 pm Ped. 0 Trucks % Cars Trucks PHF 294 0.91 13% 13 98 0.92 6% 26 455 0.86 3% 4 127 PHF Trucks Cars Trucks % → Ped. 0									
Ped. 0 Trucks % Cars Trucks PHF 332 0.92 3% 1 33 0.86 3% 5 172 0.64 6% 1 18 597 109 0 0% 0.85 217 7 3% 0.90 88 2 2% 0.85 355									

MD Peak: 12:00 pm Ped. 0 Trucks % Cars Trucks PHF 158 0.88 0% 0 14 0.74 4% 4 92 0.69 27% 3 11 206 0.82 80% 37 46 0.93 10% 18 186 0.82 2% 1 46 PHF Trucks Cars Trucks % → Ped. 0									
Ped. 0 Trucks % Cars Trucks PHF 42 2 5% 0.75 103 5 5% 0.86 37 2 5% 0.77 178 0 Ped. ↑									

Total Count 8 hours Ped. 0 Trucks % Cars Trucks PHF 1634 4% 6 161 4% 48 1159 8% 23 295 2801 43% 191 448 9% 155 1688 4% 21 502 PHF Trucks Cars Trucks % → Ped. 0									
Ped. 0 Trucks % Cars Trucks PHF 119 10 8% 1948 289 15% 576 45 8% 2326 477 27 6% 1067 57 5% 558 23 4% 2237									

Time	NORTH APPROACH						EAST APPROACH						SOUTH APPROACH						WEST APPROACH						Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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APPENDIX B
Site Generated Traffic

**APPENDIX B
SITE GENERATED TRAFFIC
VICDOM UTICA
PIT**

PIT AGGREGATE

Production

Average	250,000	tonnes
Maximum	500,000	tonnes

Fleet Usage	Tonnes Per Load	% of Trips
Triaxle	23	50%
Tractor with Trailer/ Triaxle with Pony	37	50%

Average per Load 30 tonnes

Annual Trip Generation

	Total Annual Tonnage	Tonnes Per Load	Trips Per Year
Average Year	250,000	30	8,333
		Total Trips Out	8,333
		Total Trips In	8,333
		Total Trips (Out + In)	16,667
Maximum Year (Licence Limit)	500,000	30	16,667
		Total Trips Out	16,667
		Total Trips In	16,667
		Total Trips (Out + In)	33,333

Daily Trip Generation

Percentage (%) shipped in peak months	90%
Peak Months: May to November	7
Average number of working days per month:	21
Daily Peak Traffic Factor:	1.5

Total Annual Tonnage	Total Trips Per Year	Total Working Days in Peak Months	Trips Per Day in Peak Months
250,000	16,667	147	153
500,000	33,333	147	306

**APPENDIX B
SITE GENERATED TRAFFIC
VICDOM UTICA
PIT**

TOTAL TRIP GENERATION

Peak Hours of Operation

From: 6:00 AM

To: 4:00 PM

Total Hours: 10

% Shipped in Peak Hours 90%

Total Annual Tonnage	Trips Per Day	Average Trips Per Peak Hour	Minutes Between Trips
250,000	153	14	4
500,000	306	28	2

APPENDIX C
Level of Service Definition

LEVEL OF SERVICE AT UNSIGNALIZED INTERSECTIONS

The assessment of unsignalized intersections is based on the methods described in the "Highway Capacity Manual 2000", published in 2000 by the Transportation Research Board.

The term "Level of Service" is often used to assist in clarifying the arithmetic analysis associated with traffic engineering. "Level of Service" implies a qualitative measure of traffic flow at an intersection, and is dependent upon vehicle delay and vehicle queue lengths at the approaches. The Level of Service can be determined based on the ratio between traffic volumes and approach capacity or "V/C" ratio. The following table describes the characteristics of each level:

Level of Service	Description	Control Delay (sec)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	10 to 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	15 to 25
D	Longer traffic delays occur. Motorists emerging from the minor street experience longer delays in making turns. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	25 to 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	35 to 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Extremely long traffic delays occur.	> 50

APPENDIX D
Intersection Analysis

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	S. Brumwell			Intersection	Vicdom Utica Pit Driveway			
Agency/Co.	Skelton, Brumwell			Jurisdiction	Township of Uxbridge			
Date Performed	04/11/14			Analysis Year	2014 (average demand)			
Analysis Time Period	A.M. Peak Hour							
Project Description 12-2630								
East/West Street: Goodwood Road				North/South Street: Gravel Pit Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	4	233			544	4		
Peak-Hour Factor, PHF	0.95	0.91	1.00	1.00	0.91	0.95		
Hourly Flow Rate, HFR (veh/h)	4	256	0	0	597	4		
Percent Heavy Vehicles	100	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				4	0	2		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95		
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	2		
Percent Heavy Vehicles	0	0	0	100	0	100		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			1			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	4						6	
C (m) (veh/h)	635						256	
v/c	0.01						0.02	
95% queue length	0.02						0.07	
Control Delay (s/veh)	10.7						19.4	
LOS	B						C	
Approach Delay (s/veh)	--	--				19.4		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	S. Brumwell			Intersection	Vicdom Utica Pit Driveway			
Agency/Co.	Skelton, Brumwell			Jurisdiction	Township of Uxbridge			
Date Performed	04/11/2014			Analysis Year	2014 (maximum demand)			
Analysis Time Period	A.M. Peak Hour							
Project Description 12-2630								
East/West Street: Goodwood Road				North/South Street: Gravel Pit Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	7	233			544	7		
Peak-Hour Factor, PHF	0.95	0.91	1.00	1.00	0.91	0.95		
Hourly Flow Rate, HFR (veh/h)	7	256	0	0	597	7		
Percent Heavy Vehicles	100	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				7	0	7		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95		
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7		
Percent Heavy Vehicles	0	0	0	100	0	100		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	633						273	
v/c	0.01						0.05	
95% queue length	0.03						0.16	
Control Delay (s/veh)	10.8						18.9	
LOS	B						C	
Approach Delay (s/veh)	--	--				18.9		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	S. Brumwell			Intersection	Vicdom Utica Pit Driveway			
Agency/Co.	Skelton, Brumwell			Jurisdiction	Township of Uxbridge			
Date Performed	04/11/2014			Analysis Year	2024 (average demand)			
Analysis Time Period	A.M. Peak Hour							
Project Description 12-2630								
East/West Street: Goodwood Road				North/South Street: Gravel Pit Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	4	299			697	4		
Peak-Hour Factor, PHF	0.95	0.91	1.00	1.00	0.91	0.95		
Hourly Flow Rate, HFR (veh/h)	4	328	0	0	765	4		
Percent Heavy Vehicles	100	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				4	0	4		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95		
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	4		
Percent Heavy Vehicles	0	0	0	100	0	100		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	4						8	
C (m) (veh/h)	534						198	
v/c	0.01						0.04	
95% queue length	0.02						0.13	
Control Delay (s/veh)	11.8						23.9	
LOS	B						C	
Approach Delay (s/veh)	--	--				23.9		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	S. Brumwell			Intersection	Vicdom Utica Pit Driveway			
Agency/Co.	Skelton, Brumwell			Jurisdiction	Township of Uxbridge			
Date Performed	04/11/2014			Analysis Year	2024 (maximum demand)			
Analysis Time Period	A.M. Peak Hour							
Project Description 12-2630								
East/West Street: Goodwood Road				North/South Street: Gravel Pit Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	7	299			697	7		
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.91	0.95		
Hourly Flow Rate, HFR (veh/h)	7	324	0	0	765	7		
Percent Heavy Vehicles	100	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				7	0	7		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95		
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7		
Percent Heavy Vehicles	0	0	0	100	0	100		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	533						197	
v/c	0.01						0.07	
95% queue length	0.04						0.23	
Control Delay (s/veh)	11.8						24.7	
LOS	B						C	
Approach Delay (s/veh)	--	--				24.7		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	S. Brumwell			Intersection	Vicdom Utica Pit Driveway			
Agency/Co.	Skelton, Brumwell			Jurisdiction	Township of Uxbridge			
Date Performed	04/11/14			Analysis Year	2014 (average demand)			
Analysis Time Period	P.M. Peak Hour							
Project Description 12-2630								
East/West Street: Goodwood Road				North/South Street: Gravel Pit Driveway				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	4	686			294	4		
Peak-Hour Factor, PHF	0.95	0.91	1.00	1.00	0.84	0.95		
Hourly Flow Rate, HFR (veh/h)	4	753	0	0	350	4		
Percent Heavy Vehicles	100	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				4	0	4		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95		
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	4		
Percent Heavy Vehicles	0	0	0	100	0	100		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	4						8	
C (m) (veh/h)	816						234	
v/c	0.00						0.03	
95% queue length	0.01						0.11	
Control Delay (s/veh)	9.4						20.9	
LOS	A						C	
Approach Delay (s/veh)	--	--				20.9		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	S. Brumwell
Agency/Co.	Skelton, Brumwell
Date Performed	04/11/2014
Analysis Time Period	P.M. Peak Hour

Site Information

Intersection	Vicdom Utica Pit Driveway
Jurisdiction	Township of Uxbridge
Analysis Year	2014 (maximum demand)

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	7	686			294	7
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	7	745	0	0	350	7
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7	0	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	813						234	
v/c	0.01						0.06	
95% queue length	0.03						0.19	
Control Delay (s/veh)	9.5						21.4	
LOS	A						C	
Approach Delay (s/veh)	--	--				21.4		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	S. Brumwell		Intersection	Vicdom Utica Pit Driveway
Agency/Co.	Skelton, Brumwell		Jurisdiction	Township of Uxbridge
Date Performed	04/11/2014		Analysis Year	2024 (average demand)
Analysis Time Period	P.M. Peak Hour			

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street		Eastbound			Westbound		
Movement		1	2	3	4	5	6
		L	T	R	L	T	R
Volume (veh/h)		4	878			377	4
Peak-Hour Factor, PHF		0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)		4	954	0	0	448	4
Percent Heavy Vehicles		100	--	--	0	--	--
Median Type		Undivided					
RT Channelized				0			0
Lanes		0	1	0	0	1	0
Configuration		LT					TR
Upstream Signal			0			0	
Minor Street		Northbound			Southbound		
Movement		7	8	9	10	11	12
		L	T	R	L	T	R
Volume (veh/h)					4	0	4
Peak-Hour Factor, PHF		1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)		0	0	0	4	0	4
Percent Heavy Vehicles		0	0	0	100	0	100
Percent Grade (%)		0			0		
Flared Approach			N			N	
Storage			0			0	
RT Channelized				0			0
Lanes		0	0	0	0	1	0
Configuration						LTR	

Delay, Queue Length, and Level of Service

Approach		Eastbound	Westbound	Northbound			Southbound		
Movement		1	4	7	8	9	10	11	12
Lane Configuration		LT						LTR	
v (veh/h)		4						8	
C (m) (veh/h)		739						154	
v/c		0.01						0.05	
95% queue length		0.02						0.16	
Control Delay (s/veh)		9.9						29.7	
LOS		A						D	
Approach Delay (s/veh)		--	--					29.7	
Approach LOS		--	--					D	

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	S. Brumwell		Intersection	Vicdom Utica Pit Driveway
Agency/Co.	Skelton, Brumwell		Jurisdiction	Township of Uxbridge
Date Performed	04/11/2014		Analysis Year	2024 (maximum demand)
Analysis Time Period	P.M. Peak Hour			

Project Description 12-2630

East/West Street: Goodwood Road

Intersection Orientation: East-West

North/South Street: Gravel Pit Driveway

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	7	878			377	7
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	7	954	0	0	448	7
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7	0	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	737						153	
v/c	0.01						0.09	
95% queue length	0.03						0.30	
Control Delay (s/veh)	9.9						30.9	
LOS	A						D	
Approach Delay (s/veh)	--	--					30.9	
Approach LOS	--	--					D	

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	S. Brumwell		Intersection	Vicdom Utica Pit Driveway
Agency/Co.	Skelton, Brumwell		Jurisdiction	Township of Uxbridge
Date Performed	04/11/2014		Analysis Year	2014 (average demand)
Analysis Time Period	3:00 to 4:00 p.m.			

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	4	460			307	4
Peak-Hour Factor, PHF	0.95	0.91	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	4	505	0	0	365	4
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				4	0	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	4
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	4						8	
C (m) (veh/h)	804						305	
v/c	0.00						0.03	
95% queue length	0.01						0.08	
Control Delay (s/veh)	9.5						17.1	
LOS	A						C	
Approach Delay (s/veh)	--	--				17.1		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	S. Brumwell
Agency/Co.	Skelton, Brumwell
Date Performed	04/11/2014
Analysis Time Period	3:00 to 4:00 p.m.

Site Information

Intersection	Vicdom Utica Pit Driveway
Jurisdiction	Township of Uxbridge
Analysis Year	2014 (maximum demand)

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	7	460			307	7
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	7	499	0	0	365	7
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7	0	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	801						303	
v/c	0.01						0.05	
95% queue length	0.03						0.14	
Control Delay (s/veh)	9.5						17.5	
LOS	A						C	
Approach Delay (s/veh)	--	--					17.5	
Approach LOS	--	--					C	

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	S. Brumwell		Intersection	Vicdom Utica Pit Driveway
Agency/Co.	Skelton, Brumwell		Jurisdiction	Township of Uxbridge
Date Performed	04/11/2014		Analysis Year	2024 (average demand)
Analysis Time Period	3:00 to 4:00 p.m.			

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	4	589			393	4
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	4	640	0	0	467	4
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				4	0	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	4
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	4						8	
C (m) (veh/h)	725						223	
v/c	0.01						0.04	
95% queue length	0.02						0.11	
Control Delay (s/veh)	10.0						21.7	
LOS	A						C	
Approach Delay (s/veh)	--	--					21.7	
Approach LOS	--	--					C	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	S. Brumwell
Agency/Co.	Skelton, Brumwell
Date Performed	04/11/2014
Analysis Time Period	3:00 to 4:00 p.m.

Site Information

Intersection	Vicdom Utica Pit Driveway
Jurisdiction	Township of Uxbridge
Analysis Year	2024 (maximum demand)

Project Description 12-2630

East/West Street: Goodwood Road

North/South Street: Gravel Pit Driveway

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	7	589			393	7
Peak-Hour Factor, PHF	0.95	0.92	1.00	1.00	0.84	0.95
Hourly Flow Rate, HFR (veh/h)	7	640	0	0	467	7
Percent Heavy Vehicles	100	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7	0	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	1.00	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	7
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	7						14	
C (m) (veh/h)	723						221	
v/c	0.01						0.06	
95% queue length	0.03						0.20	
Control Delay (s/veh)	10.0						22.4	
LOS	B						C	
Approach Delay (s/veh)	--	--				22.4		
Approach LOS	--	--				C		

APPENDIX E
Curriculum Vitae
Scott Brumwell, P. Eng.

Scott W. Brumwell, B.Sc. (Eng.), P. Eng.
Vice President, Principal

EDUCATION

Bachelor of Science in Engineering

University of Guelph, 1983

Majored in Water Resources Engineering

PROFESSIONAL BACKGROUND

Skelton, Brumwell & Associates Inc.

1987 to present

Vice President and Principal Engineer responsible for managing civil engineering projects undertaken by the firm. Specializing in project administration, development servicing design (roads, sewers, watermain), contract preparation, construction administration, master servicing planning, development cost sharing agreements, stormwater management, transportation impact analysis and Phase I Environmental Site Assessments.

R. E. Clipsham Limited

1983 to 1987

Project Engineer responsible for the preparation of designs, reports, cost estimates and tender documents for various municipal engineering projects undertaken by the firm.

MEMBERSHIP & ASSOCIATIONS

Professional Engineers of Ontario (designated as a Consulting Engineer)

Qualified Designer for Sewage Systems and Plumbing (All Buildings) under Section 2.17 of the Ontario Building Code (BCIN 24241)

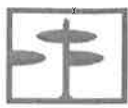
Institute of Transportation Engineers

Chair of the Georgian College Environmental Technology Advisory Committee, 2009 to present

Kempfenfelt Rotary Club (Director 2006–2007 & 2009–2010, Treasurer 2010–2013, President Elect 2013-2014)

Chair of the Simcoe County Chapter Executive of the Professional Engineers of Ontario (1990-1991)

Royal Canadian Legion



Scott W. Brumwell, B.Sc. (Eng.), P. Eng.
Vice President, Principal

PROJECT EXPERIENCE (TRAFFIC IMPACT STUDIES)

Vitajoe Condominium Development, Barrie

Triple C Investments Gravel Pit, Penetanguishene

Malfara Commercial Site, Township of Springwater

Granite Ridge Subdivision Phase 2, Township of Galway (Cavendish & Harvey), Peterborough County

Georgian Manor Redevelopment, Penetanguishene

Vicdom Brock Road Gravel Pit, Township of Uxbridge, Region of Durham

Miller Braeside Quarry, Township of McNab / Braeside, Renfrew County

Skyline Port McNicoll Phase I Residential Development, Tay Township (Port McNicoll)

Geofam Sebright Quarry, City of Kawartha Lakes

Hillway 12th Line Gravel Pit, Township of Oro-Medonte, Simcoe County

Bass Lake Gravel Pits, Township of Galway – Cavendish & Harvey, County of Peterborough

Kovacs Gravel Pit Expansion, Municipality of Clarington