

Exhibit 3-3: Existing Road and Rail Network

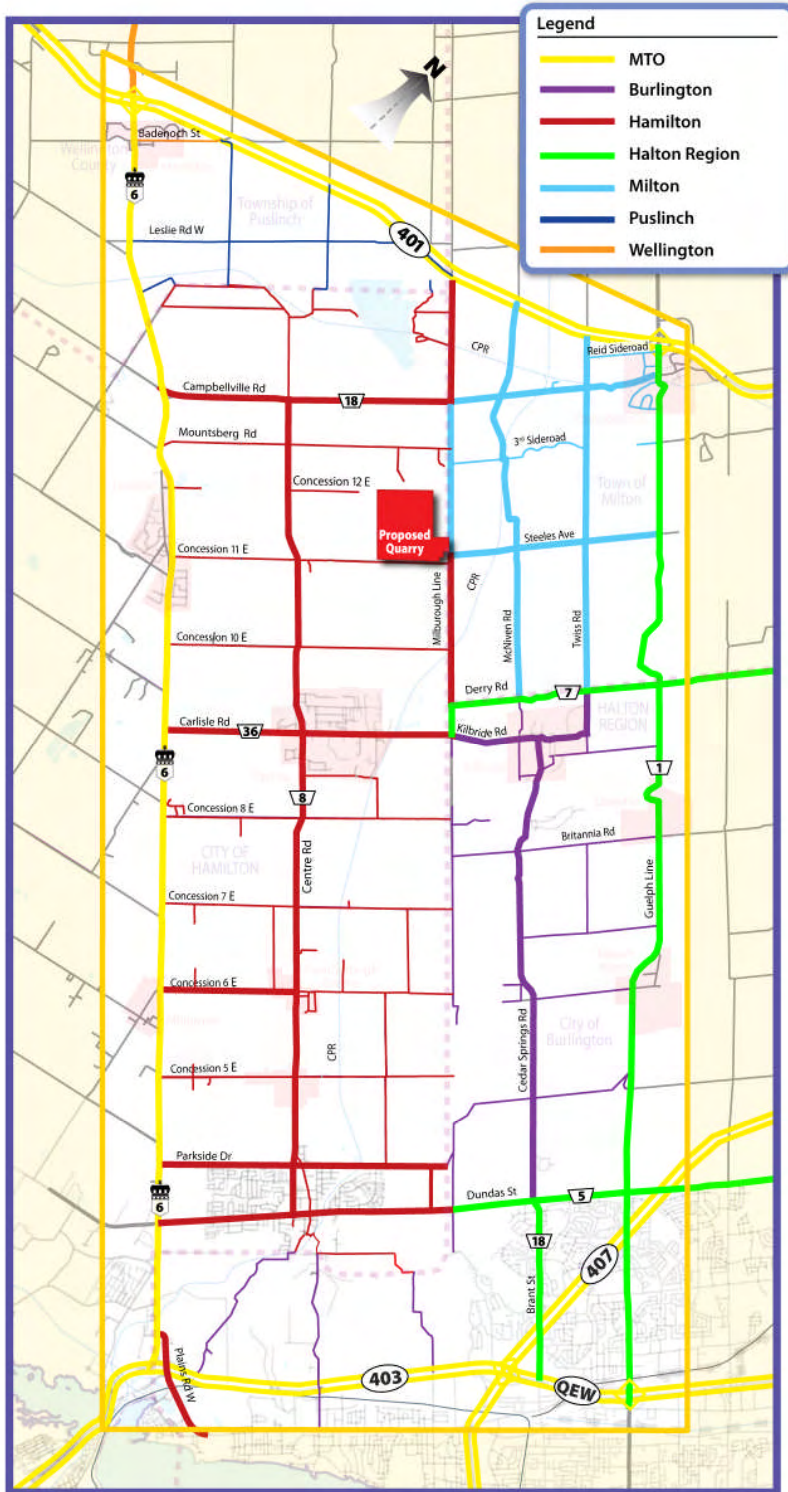


Exhibit 3-4: Road Jurisdictions

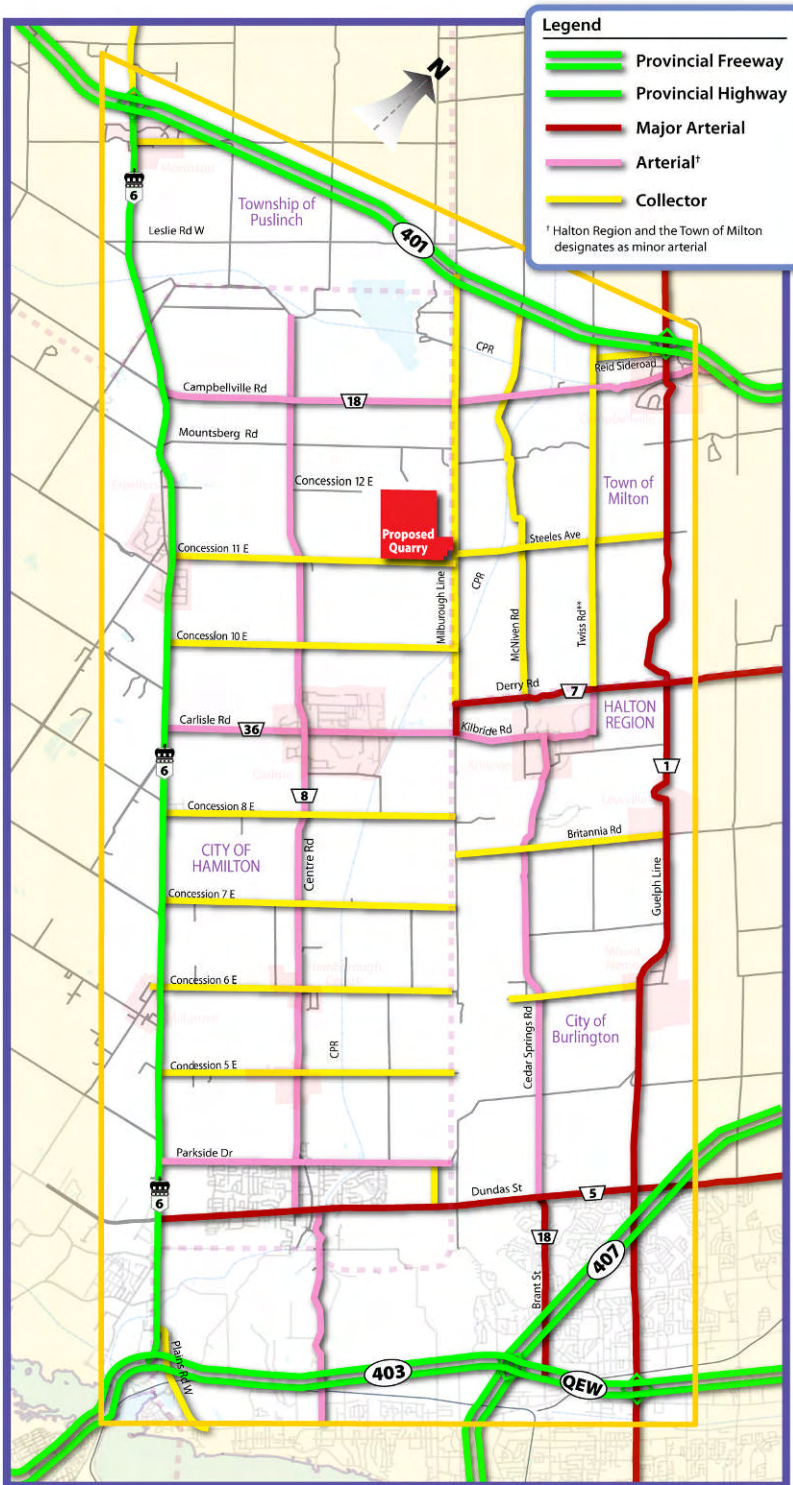
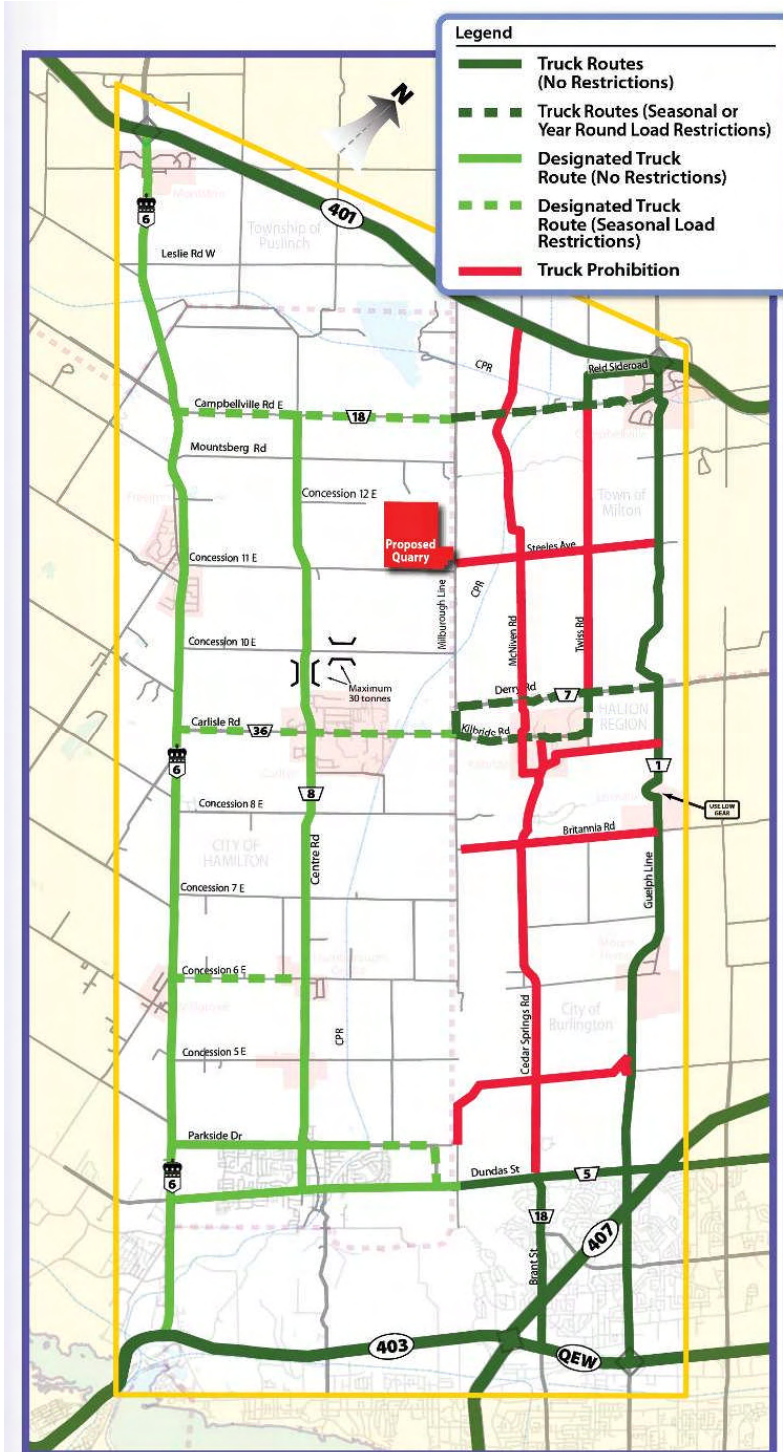


Exhibit 3-5: Road Classifications

3.11.2 Designated Truck Routes and Restrictions



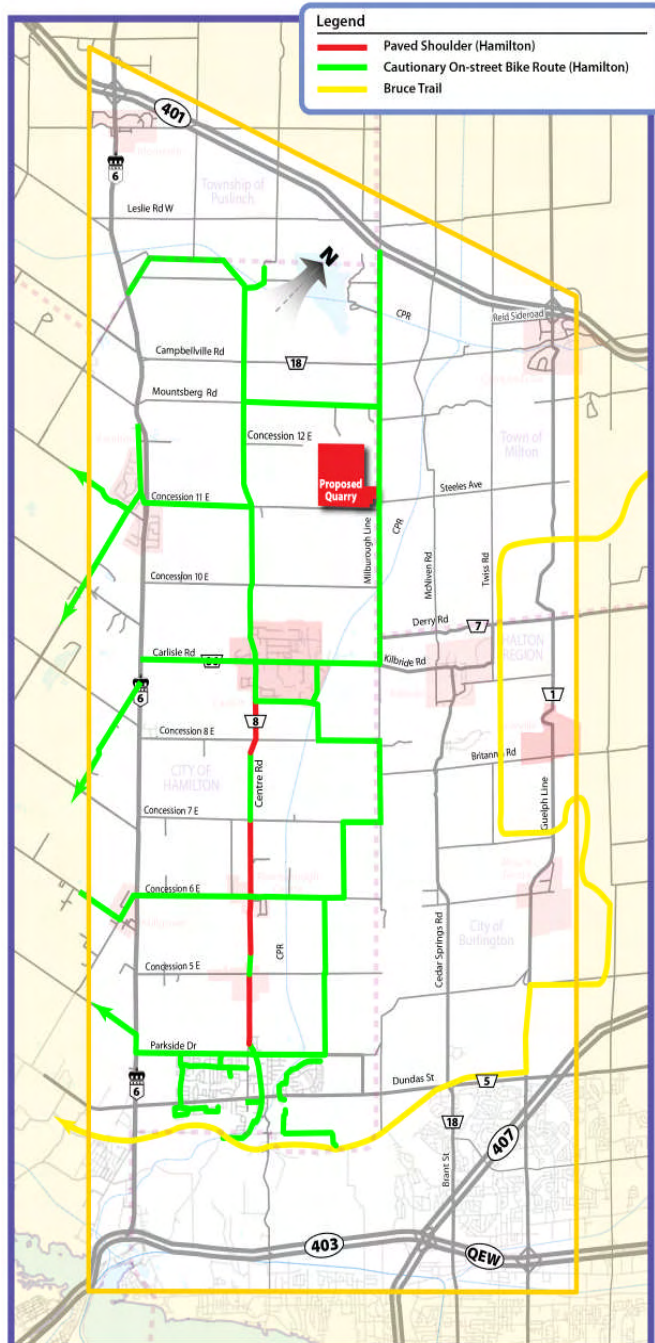
The designated truck routes and load restrictions within the study area are illustrated in **Exhibit 3-6**. This exhibit is based on information obtained from municipal staff and the Burlington Rural Truck Route Map. Trucks are restricted at most of the minor arterial roads and collector roads in the Town of Milton.

This exhibit represents the information available prior to the recent Milton Truck Restriction By-law.

Exhibit 3-6: Designated Truck Routes and Load Restrictions

3.11.3 Existing Cycling and Multi-Use Trail Networks

3.11.3.1 City of Hamilton



The City of Hamilton's Existing Cycling Network within the study area consists of on-street cautionary unsigned bike routes and paved shoulders. The City's existing cycling network is illustrated in the Hamilton Bike Routes, Trails and Parks map, dated March 2008. Cautionary unsigned routes are defined as links in the network that have mostly low to moderate traffic volumes and no dedicated cycling infrastructure.

Information on the Bruce Trail was obtained from the Ontario Trails Cycling Map, dated 2002. The Bruce Trail is the oldest and longest continuous footpath in Canada. It runs along the Niagara Escarpment from Niagara to Tobermory, spanning more than 850 km of main trail and 250 km of side trails. This trail runs through the City of Hamilton as well as Halton Region.

The City's existing cycling network is illustrated in **Exhibit 3-7**. This exhibit also illustrates the location of the Bruce Trail within the study area.

The existing multi-use path network within the City of Hamilton is also illustrated in the City's TMP. **Exhibit 3-8** illustrates the multi-use path network within the study area. It should be noted that this exhibit does not illustrate the location of the Bruce Trail.

Exhibit 3-7: Hamilton On-Street Cycling Network and the Bruce Trail

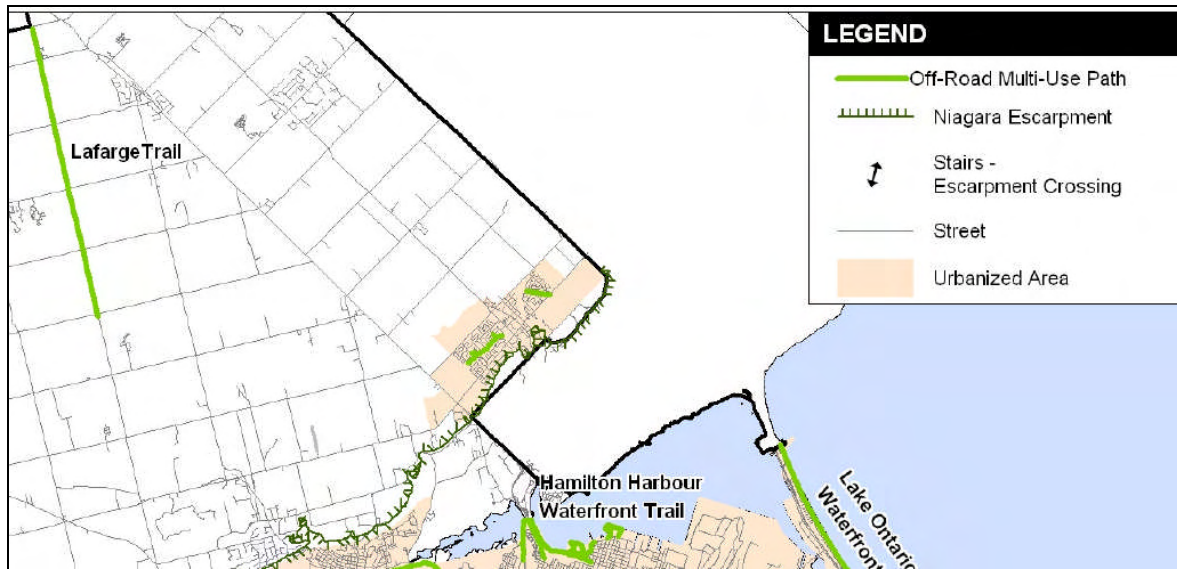


Exhibit 3-8: Hamilton's Existing Multi-Use Path Network

3.11.3.2 Region of Halton

The location of the existing cycling and off-road cycling facilities within the Region of Halton was obtained from the Region's 2004 Transportation Master Plan as well as the 2005 Cycling in Halton Map. The portion of the Cycling in Halton Map which illustrates the existing on road and multi-use trail network within the study area is shown in **Exhibit 3-8**. It should be noted that this exhibit does not illustrate the location of the Bruce Trail, which also runs through Halton Region. The location of the Bruce Trail is illustrated in **Exhibit 3-9**. There are two classifications of on road cycling facilities in Halton, on road bike facilities and on road suggested routes.

On road bike facilities are located on roads that have designated cycling lanes and paved shoulder and/or "Share the Road" signs. Designated cycling lanes are provided in urban areas while paved shoulders are provided in rural areas.

On road suggested routes are on roads with lower traffic volumes that provide continuity with other cycling facilities or provide a preferred route through a busy corridor. There are no designated bike lanes or signs on road suggested routes.

Within the study area, there are a number of roads that have extra caution advisories, due to changes in elevation, intersection sight lines and/or roads with higher traffic volumes.



Exhibit 3-9: Halton's Cycling Facilities/Trails

3.11.3.3 Cycling Agencies

Information regarding the existing cycling network information was provided in part by the Burlington Cycling Committee, Hamilton Cycling Committee, and the City of Hamilton Traffic Engineering and Operations office.

3.11.3.4 Cycling Events

There are a number of cycling events held annually in the Study Area. One event in particular is the Tour de FORCE which is organized by Friends of Rural Communities and the Environment (FORCE). This event includes both a 50 km and 100 km cycling route that traverses many of the roads in the Study Area. The Study Area may also be used for cycling events held by other groups including the Hamilton Cycling Committee, Burlington Cycling Committee, Toronto Cycling Committee, Halton Outdoors Club, Regional Niagra Cycling Committee, Oakville Cycling Club, Ontario Cycling Alliance, Bike Toronto, and MACycle Co-op, the McMaster University cycling club.

3.11.4 School Bus and Public Transit Routes

Exhibit 3-10 illustrates the estimated number of school buses by route as well as the daily frequency per direction. This information was provided by the Hamilton-Wentworth District School Board, the Hamilton-Wentworth Catholic School Board, the Hamilton District School Board and the Halton Catholic District School Board.

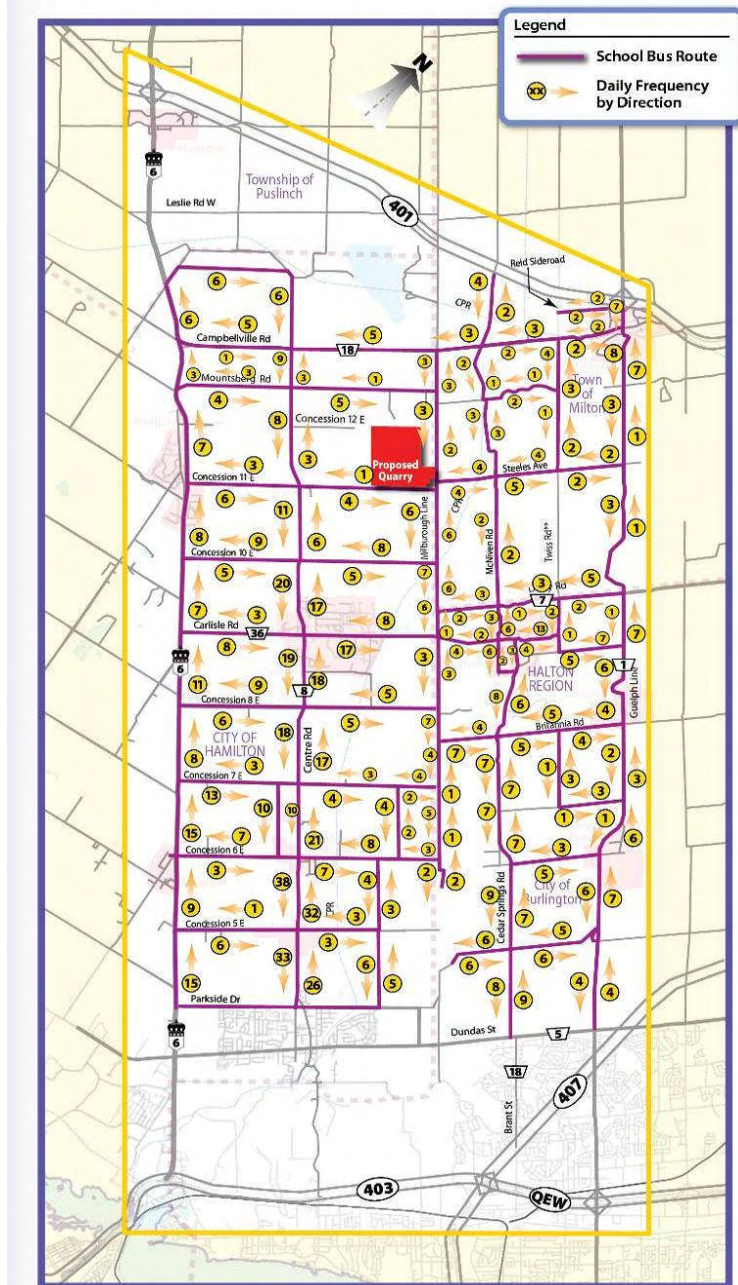


Exhibit 3-10: Estimated Number of School Buses by Route

3.11.5 Constraints

The constraints within the study area include schools, fire stations, settlement areas, locations with substandard visibility, long steep grades, parks and recreation areas, churches / cemeteries and community facilities. **Exhibit 3-11** illustrates the location of these constraints, which is based on information obtained from the Official Plans of Hamilton and Halton, Map Art and field investigations.

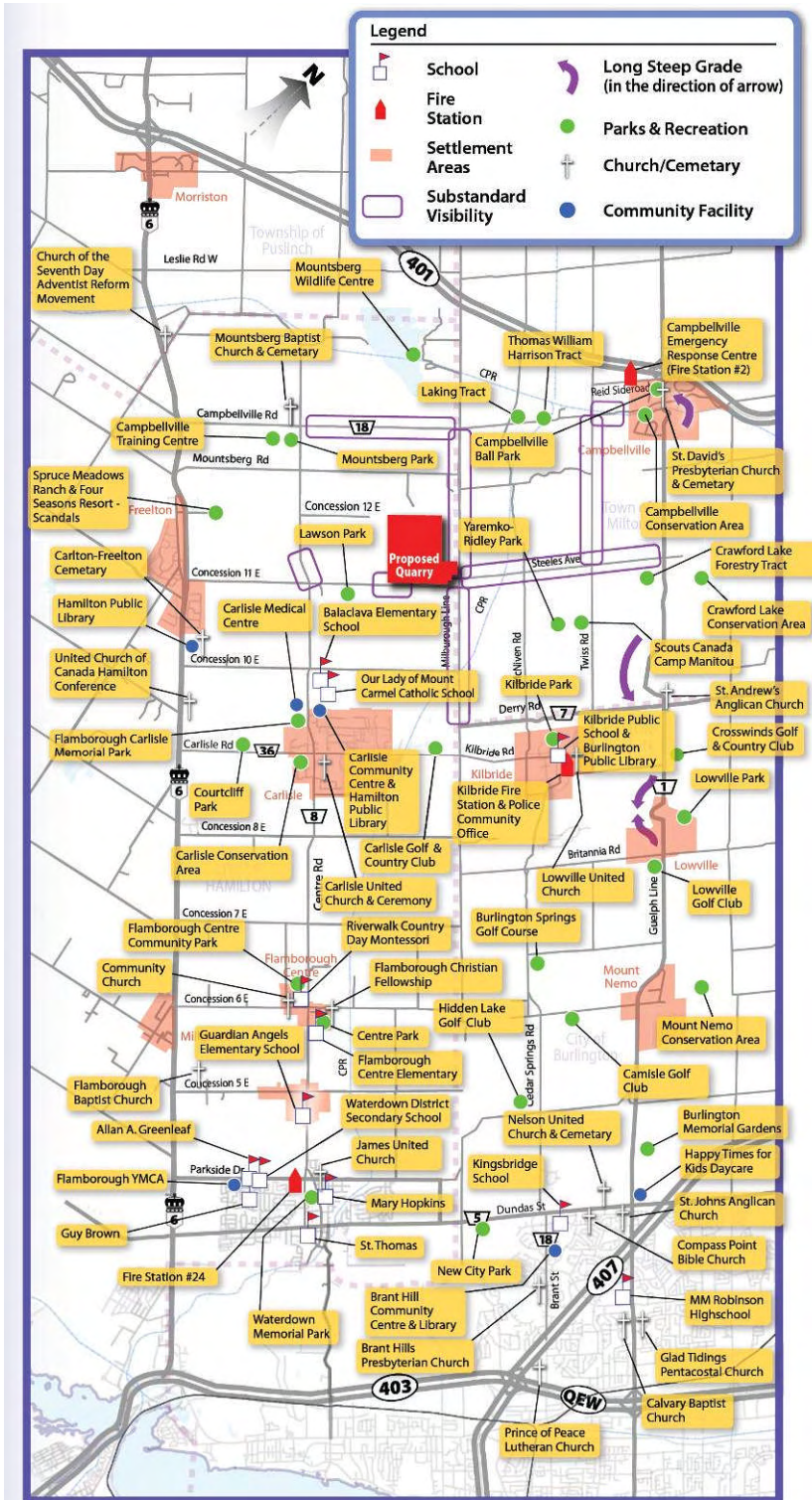


Exhibit 3-11: Constraints within the Study Area

4. AGGREGATES SUPPLY AND DEMAND

Mineral aggregates are a non-renewable resource that consist of predominantly sand, gravel, clay and bedrock. Aggregates are a required construction material, and are consumed in very large quantities to meet society's needs for construction and infrastructure development. Aggregate requirements are supplied through the establishment of pits and quarries (operations located in sand, gravel and clay deposits are called pits, and excavations in bedrock materials are called quarries¹). The location of mineral aggregate pits and quarries depends on local geology and physiographic features, and whether the quantity and quality of the deposits warrant extraction.

To understand the origin and destination patterns of Flamborough Quarry truck trips, it is important to understand where the markets for aggregates are located, and how these markets develop. An area where the demand for aggregates exceeds the supply is said to have an aggregates deficiency. Knowledge of areas with a deficiency will provide a basis for analyzing potential haul routes and the distribution of truck trips.

4.1 Location of Mineral Aggregates

Mineral aggregate resources can be found in pockets across the province. Each source varies in quality and significance. **Exhibit 4-1** shows the location of deposits of primary aggregate resources in southern Ontario. (The map was prepared by the Ontario Ministry of Natural Resources, and does not take into account any land use, social, economic, or environmental constraints.)

Some areas have abundant resources, while others have little or none. **Exhibit 4-1** shows that the unconstrained Amabel Dolostone deposits of southern Ontario are concentrated in the Niagara Escarpment, Hamilton, Halton Region, and Grey County areas. They are coloured brown in **Exhibit 4-1** (the Amabel/Lockport formation).

¹ Hollingsworth, Brian, "Mineral Aggregates Issues Paper," prepared for the Smart Growth Central Ontario Zone, Ontario Ministry of Natural Resources, October 2002.

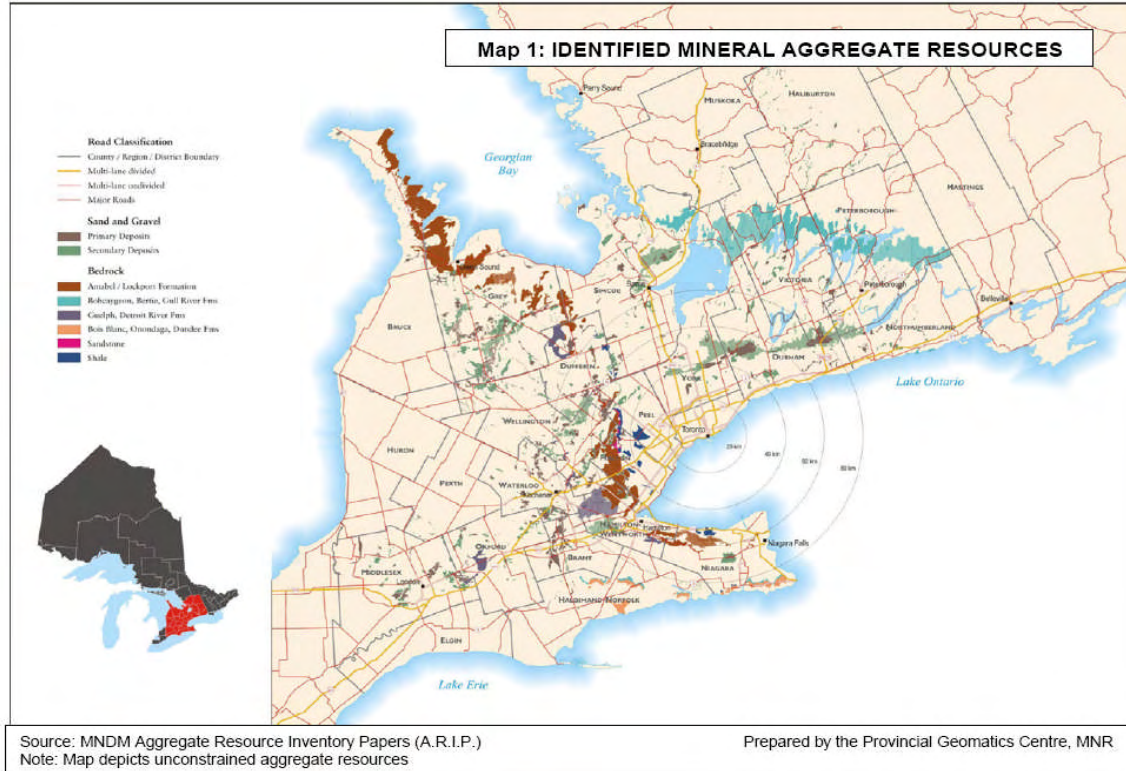


Exhibit 4-1: Identified Mineral Aggregate Resources in Southern Ontario

4.2 Areas of Supply and Demand for Aggregates

The demand for mineral aggregates fluctuates, and depends on local, regional, and provincial requirements. A deposit may have a local, regional and provincial significance, but because mineral aggregates are heavy, bulky and relatively low in price, local resources are always significant.

Clayton Research undertook a study which examined the difference between areas of aggregate supply and areas of aggregate demand. The study was documented in a paper prepared for the Smart Growth Central Ontario Zone in 2002¹.

Exhibit 4-2 shows the areas of aggregate production and consumption in Ontario in 1998 to 2000, as reported by Clayton Research. The Greater Toronto Area (GTA) (the largest population centre in the province) consumes far more aggregates than the area produces.

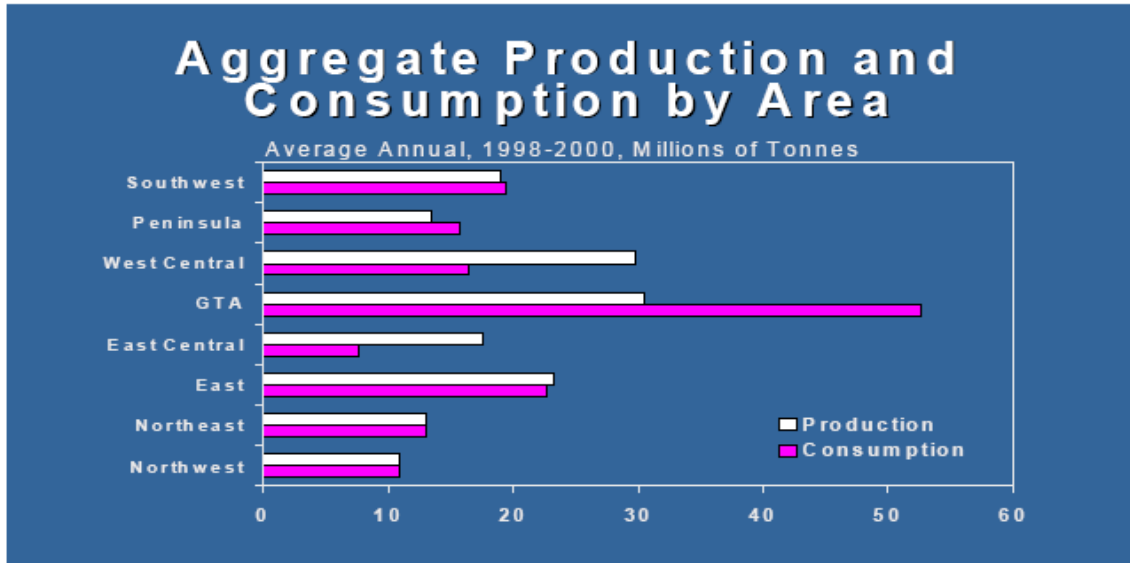


Exhibit 4-2: Aggregate Production and Consumption in Ontario by Area

The Clayton Research Study found that municipalities that have aggregate resources and are located close to the Greater Toronto Area (GTA) have the highest aggregate production. This finding confirms the significance of a local supply. This emphasizes the importance of the resource not only as a local supply but also as a regionally and provincially significant resource. The underlying message was that areas rich in aggregate resources need to share them with those without aggregate resources.

It is proposed that understanding the sources and markets on a Regional scale helps to provide an estimate of the current and future market demand for the Amabel Dolostone from the proposed quarry and can therefore be used to establish trip distribution patterns for the quarry trucks.

4.3 Assumptions for Analyzing the Market for Aggregates

The approach used in this study is to analyze the market for the mineral aggregates to be produced by the proposed Flamborough quarry based on the best information available.

The following assumptions are made:

1. All of the key market locations for the proposed quarry are located within the Greater Golden Horseshoe (GGH) area. This assumption is based on the discussion in **Sections 4.1 and 4.2.**
2. Population and employment growth is a surrogate for aggregate demand. This assumption is based on a study by the California Department of Conservation. The Department found that population change had a strong correlation with historical aggregate demand².
3. Licensed Permit Production by a lower tier municipality is a surrogate for aggregate supply. This assumption was necessary because tonnages by quarry are not available from any source as this information is considered proprietary data. Staff at The Ontario Aggregate Resources Corporation (TOARC) said that their 2006 statistical update is the best source of production information.

² Department of Conservation –California Geological Survey, “Aggregate Availability in California,” 2006.

4.4 Population and Employment Data

Table 4-1 summarizes projected population and employment data for the GGH. The data are from the Places to Grow Growth Plan³. Due to the way the data were presented for the year 2031, some of the municipalities were combined. The combined municipalities are:

- County of Peterborough and the City of Peterborough
- County of Simcoe, City of Barrie, and City of Orillia
- County of Wellington and City of Guelph
- County of Brant and City of Bradford

The last two columns show the combined population and employment growth (our surrogate for aggregate demand (**Section 4.3**)), and the expected growth between 2011 and 2031.

Table 4-1: Distribution of Projected Population and Employment in the Greater Golden Horseshoe, 2011 and 2031³

	Population 000's			Employment 000's			Population + Employment Growth Total	
	2011	2031	Growth	2011	2031	Growth	Growth 000's	Total Growth
Region of Durham	660	960	300	260	350	90	390	11.7%
Region of York	1,060	1,500	440	590	780	190	630	18.9%
City of Toronto	2,760	3,080	320	1,540	1,640	100	420	12.6%
Region of Peel	1,320	1,640	320	730	870	140	460	13.8%
Halton Region	520	780	260	280	390	110	370	11.1%
City of Hamilton	540	660	120	230	300	70	190	5.7%
County of Northumberland	87	96	9	32	33	1	10	0.3%
County of Peterborough/City of Peterborough	137	149	12	58	60	2	14	0.4%
City of Kawartha Lakes	80	100	20	23	27	4	24	0.7%
County of Simcoe/City of Barrie/City of Orillia	484	667	183	196	254	58	241	7.2%
County of Dufferin	62	80	18	22	27	5	23	0.7%
County of Wellington/City of Guelph	223	321	98	117	158	41	139	4.2%
Region of Waterloo	526	729	203	282	366	84	287	8.6%
County of Brant/City of Brantford	141	173	32	62	71	9	41	1.2%
County of Haldimand	49	56	7	19	20	1	8	0.2%
Region of Niagara	442	511	69	201	218	17	86	2.6%
Total GGH	9,091	11,502	2,411	4,642	5,564	922	3,333	

³ Ministry of Public Infrastructure Renewal, "Places to Grow Growth Plan for the Greater Golden Horseshoe," 2006. Schedule 3 – Distribution of Population & Employment for the Greater Golden Horseshoe 2001-2031.

4.5 Production of Aggregates (All Types), 2006

Table 4-2 shows licensed permit production for aggregates for each municipality in 2006, as published by TOARC. These data do not distinguish between aggregate types, and include sand and gravel, crushed stone, clay/shale, and other stone.

The number of tonnes produced by each municipality is the municipality's supply of aggregates. The total supply for the GGH in 2006 was 93,045,000 metric tonnes. **Table 4-2** also shows the percentage of the total supply produced in each municipality. Halton region and the City of Hamilton are major suppliers of aggregates in the GGH, together accounting for 20.6 percent of the total supply.

Table 4-2: Licensed Permit Production of Aggregates by Municipality (metric tonnes), 2006⁴

Municipality	Aggregate Supply	
	Metric Tonnes	%
Region of Durham	12,239,000	13.2%
Region of York	959,000	1.0%
City of Toronto	0	0.0%
Region of Peel	5,316,000	5.7%
Halton Region	9,589,000	10.3%
City of Hamilton	9,589,000	10.3%
County of Northumberland	3,387,000	3.6%
County of Peterborough/City of Peterborough	2,600,000	2.8%
City of Kawartha Lakes	6,453,000	6.9%
County of Simcoe/City of Barrie/City of Orillia	13,350,000	14.3%
County of Dufferin	3,057,000	3.3%
County of Wellington/ City of Guelph	8,354,000	9.0%
Region of Waterloo	9,174,000	9.9%
County of Brant/City of Brantford	2,268,000	2.4%
County of Haldimand	1,819,000	2.0%
Region of Niagara	4,891,000	5.3%
Total GGH	93,045,000	100.0%

⁴ The Ontario Aggregate Resources Corporation (TOARC), "Preliminary Aggregates in Ontario Statistical Update," 2006. Table 2-Licence and Wayside Permit Production by Lower Tier Municipality.

4.5.1 Areas of Aggregate Surplus and Deficiency (All Aggregate Types), 2006

Table 4-3 shows the difference between each municipality's supply of aggregates and demand for aggregates. Where the difference is positive, the municipality has an aggregate surplus. Where the difference is negative, the municipality has an aggregate deficiency.

Table 4-3: Identification of Aggregate Surplus and Deficiencies, 2006

	Aggregate Supply	Aggregate Demand	Difference (Supply – Demand)
Region of Durham	13.2%	11.7%	1.5%
Region of York	1.0%	19.0%	-17.9%
City of Toronto	0.0%	12.6%	-12.6%
Region of Peel	5.7%	13.8%	-8.1%
Halton Region	10.3%	11.1%	-0.8%
City of Hamilton	10.3%	5.7%	4.6%
County of Northumberland	3.6%	0.3%	3.3%
County of Peterborough/City of Peterborough	2.8%	0.4%	2.4%
City of Kawartha Lakes	6.9%	0.7%	6.2%
County of Simcoe/City of Barrie/City of Orillia	14.3%	7.2%	7.1%
County of Dufferin	3.3%	0.7%	2.6%
County of Wellington/ City of Guelph	9.0%	4.2%	4.8%
Region of Waterloo	9.9%	8.6%	1.2%
County of Brant/ City of Brantford	2.4%	1.2%	1.2%
County of Haldimand	2.0%	0.2%	1.7%
Region of Niagara	5.3%	2.6%	2.7%
Total GGH	100%	100.	0.0%

Four municipalities are likely to experience an aggregate deficiency in the years ahead: Region of York (-18%), City of Toronto (-13%), Region of Peel (-8%), and Halton Region (-1%). The four municipalities are shown in purple in **Exhibit 4-3**.



Exhibit 4-3: Areas with an Aggregate Demand Surplus and Deficiency, 2006

4.5.2 Reconciliation of Supply and Demand for Aggregates (All Types) across Greater Golden Horseshoe

The information shown in **Table 4-3** and **Exhibit 4-3** was used to distribute the aggregates from the surplus regions to the regions with deficiencies. The assumptions made to conduct the distribution were established to be reasonable and conservative.

The distribution of the aggregates was carried out in two stages. In Stage 1, aggregate distribution was estimated by assuming that demand was first met from bordering municipalities that had a surplus. **Table 4-4** presents a matrix for Stage 1. Aggregate deficient municipalities are shown across the top, and aggregate surplus municipalities are shown down the left side. The cells in the matrix show the percentage that we estimate will be transported between neighbouring municipalities.

Table 4-4: Matrix of Stage 1 of the Aggregate Distribution for 2006

			Deficient Municipalities				
			Region of York	City of Toronto	Region of Peel	Halton Region	Surplus Remaining
<i>Original Deficiency</i>			-18.00%	-13.00%	-8.00%	-1.00%	
<i>Stage 1 Resulting Deficiency</i>			-13.00%	-9.50%	-1.25%	0.00%	
Surplus Municipalities	Region of Durham	1.00%	0.50%	0.50%			0.00%
	City of Hamilton	5.00%	1.00%	2.50%	1.00%	0.50%	0.00%
	County of Northumberland	3.00%		0.50%			2.50%
	County of Peterborough/City of Peterborough	2.00%					2.00%
	City of Kawartha Lakes	6.00%					6.00%
	County of Simcoe/City of Barrie/City of Orillia	7.00%	3.50%		1.75%		1.75%
	County of Dufferin	3.00%			1.50%		1.50%
	County of Wellington/City of Guelph	5.00%			2.50%	0.50%	2.00%
	Region of Waterloo	1.00%					1.00%
	County of Brant/City of Brantford	1.00%					1.00%
	County of Haldimand	2.00%					2.00%
	Region of Niagara	3.00%					3.00%

The Region of Durham, for example, has a 1.0% surplus. We assume that 0.5% will go to York Region and 0.5% will go to the City of Toronto to help alleviate the aggregate deficiencies in these two areas. Durham is left in equilibrium and the two bordering municipalities have a smaller deficit. It is important to note that as demand from outside of the GGH is also anticipated, we do not expect that all of the municipalities will achieve equilibrium.

Exhibit 4-4 provides a map showing how the Stage 1 distribution shown in **Table 4-4** was applied. The Stage 1 distribution is shown in red.



Exhibit 4-4: Stage 1 and Stage 2 of the Aggregate Distribution for 2006

The matrix shown in **Table 4-5** shows how Stage 2 of the distribution of the aggregates was carried out. The blue text shows our estimates of the aggregate transfers from municipalities that are not on the border of a deficient region, but are connected by a 400 series highway.

The last column in **Table 4-5** shows the surplus aggregates remaining in each municipality. The Stage 2 surpluses are also shown in yellow in **Exhibit 4-4**. The surpluses are mostly very low (0.0% to 2.0%).

Table 4-5: Matrix of Stage 2 of the Aggregate Distribution for 2006

			Deficient Municipalities				
			Region of York	City of Toronto	Region of Peel	Halton Region	Surplus Remaining
<i>Original Deficiency</i>			-18.00%	-13.00%	-8.00%	-1.00%	
<i>Stage 1 Resulting Deficiency</i>			-13.00%	-10.00%	-1.00%	0.00%	
<i>Stage 2 Resulting Deficiency</i>			-11.75%	-7.75%	-0.25%	0.00%	
Surplus Municipalities	Region of Durham	1.00%	0.50%	0.50%			0.00%
	City of Hamilton	5.00%	1.00%	2.50%	1.00%	0.50%	0.00%
	County of Northumberland	3.00%		0.50%			2.50%
	County of Peterborough/City of Peterborough	2.00%					2.00%
	City of Kawartha Lakes	6.00%					6.00%
	County of Simcoe/City of Barrie/City of Orillia	7.00%	3.50%		1.75%		1.75%
	County of Dufferin	3.00%			1.50%		1.50%
	County of Wellington/City of Guelph	5.00%			2.50%	0.50%	2.00%
	Region of Waterloo	1.00%	0.50%	0.25%	0.25%		0.00%
	County of Brant/City of Brantford	1.00%	0.25%	0.25%	0.25%		0.25%
	County of Haldimand	2.00%					2.00%
	Region of Niagara	3.00%	0.50%	1.00%	0.50%		1.00%

Table 4-5 shows that existing aggregate supply can eliminate the deficiency in Halton Region and significantly reduce it to a negligible level in the Region of Peel (to -0.25%). Although the analysis tried to balance the supply and demand of the aggregates among the municipalities, two areas continue to have a significant deficiency after the Stage 2 distribution: the Region of York (-11.75%), and the City of Toronto (-7.75%).

Exhibit 4-5 shows the final estimated aggregate surplus and aggregate deficiency by municipality after the Stage 1 and Stage 2 analysis.

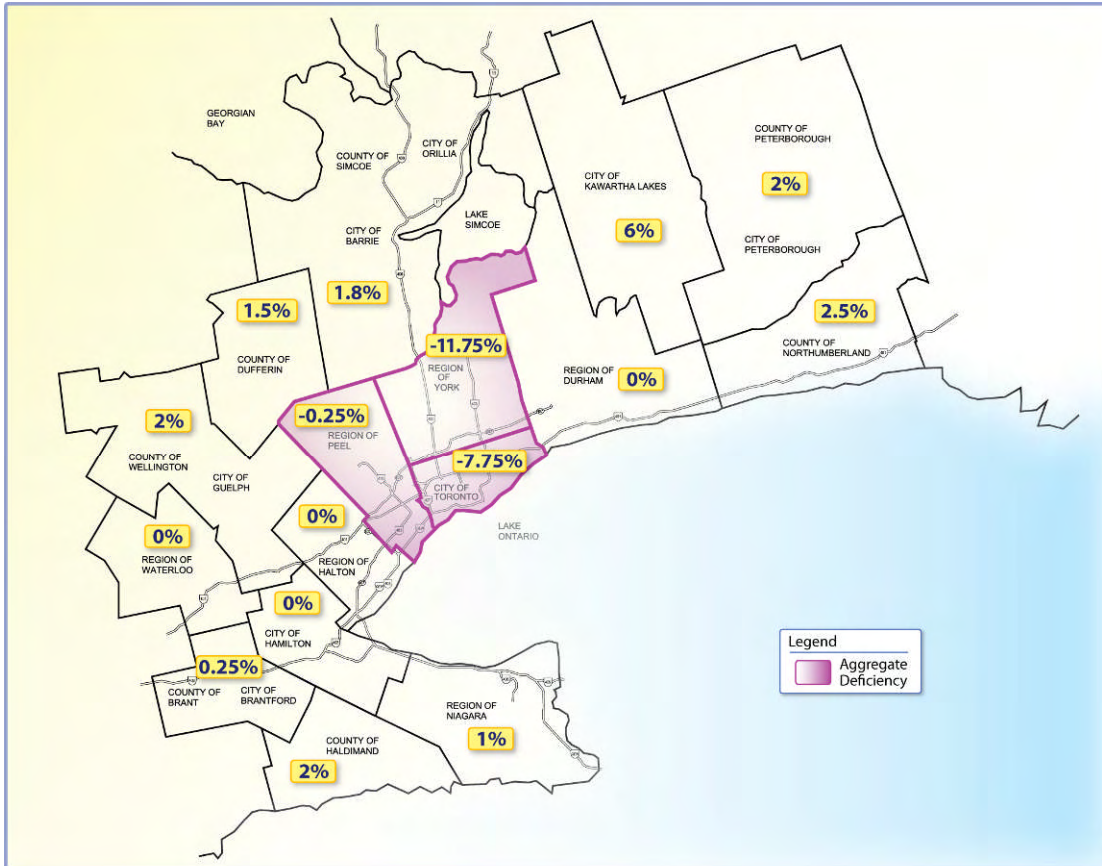


Exhibit 4-5: Estimated Aggregate Surplus and Aggregate Deficiency by Municipality after Stage 1 and Stage 2 Analysis

4.6 Production of Crushed Stone, 2007

The proposed quarry will produce Amabel Dolostone, a high quality crushed stone. As mentioned in **Section 1.1.1**, Amabel Dolostone is the most durable aggregate material found in Southern Ontario.

Unfortunately, it is very difficult to obtain detailed information about quarry operations because the information is proprietary. We were, however, able to approach the author of the 2002 “Mineral Aggregates Issues Paper” to update our data on aggregate supply, and in particular separate crushed stone supply from sand and gravel⁵. MNR makes a distinction between “crushed stone” which is derived from bedrock sources (mainly limestone and dolomite including Amabel formation) and “sand and gravel” or unconsolidated material.

⁵ Hollingsworth, Brian, “Mineral Aggregates Issues Paper – Update,” not yet published, 2007.

The interchangeability of the aggregate type is largely dependant on its intended application. Either type of aggregate may be used for base and granular materials, however, certain product specifications, notably high strength concrete and some types of asphalt paving (e.g., for 400 series highways), require high quality limestone. The chemical properties of the Amabel formation make it the highest quality of limestone available in the province.

Exhibit 4-6 shows the total aggregate production in 2007 and compares the sand/gravel and crushed stone produced by municipality. The 2007 data do not include the County of Northumberland.

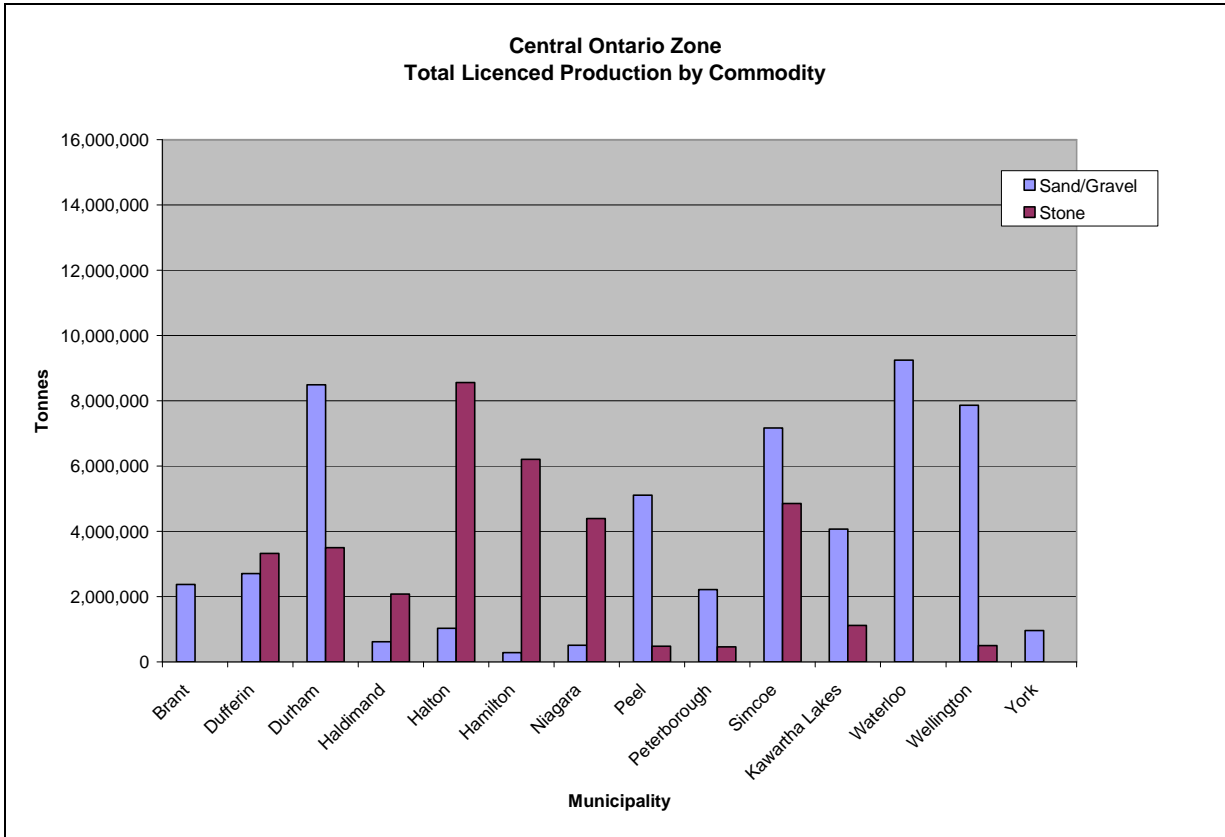


Exhibit 4-6: Comparison of Sand/Gravel Production and Crushed Stone Aggregate Production by Municipality, 2007

4.6.1 Areas of Crushed Stone Surplus and Deficiency, 2007

Table 4-2 showed that the total GGH supply of aggregates in 2006 was 93,045,000 metric tonnes. **Table 4-6** shows that the crushed stone production in the GGH in 2007 was 35,447,869 metric tonnes. **Table 4-6** also shows the percentage of crushed stone production for each municipality.

Table 4-6: Crushed Stone Production by Municipality, 2007

	Crushed Stone Supply	
	Metric Tonnes	%
Region of Durham	3,495,297	9.9%
Region of York	0	0.0%
City of Toronto	0	0.0%
Region of Peel	481,578	1.4%
Halton Region	8,559,670	24.1%
City of Hamilton	6,204,388	17.5%
County of Peterborough/City of Peterborough	458,534	1.3%
City of Kawartha Lakes	1,115,968	3.1%
County of Simcoe/City of Barrie/City of Orillia	4,851,831	13.7%
County of Dufferin	3,320,385	9.4%
County of Wellington/City of Guelph	492,741	1.4%
Region of Waterloo	0	0.0%
County of Brant/City of Brantford	0	0.0%
County of Haldimand	2,078,295	5.9%
Region of Niagara	4,389,182	12.4%
Total GGH	35,447,869	100.0%

Similar to **Table 4-3**, **Table 4-7** shows the difference between each municipality's supply of crushed stone and demand for crushed stone. Where the difference is positive, the municipality has a crushed stone surplus. Where the difference is negative, the municipality has a crushed stone deficiency.

Table 4-7: Identification of Crushed Stone Surplus and Deficiencies, 2007

	Aggregate Supply	Aggregate Demand	Difference (Supply – Demand)
Region of Durham	9.9%	11.7%	-1.9%
Region of York	0.0%	18.9%	-19.0%
City of Toronto	0.0%	12.6%	-12.6%
Region of Peel	1.4%	13.8%	-12.5%
Halton Region	24.1%	11.1%	13.0%
City of Hamilton	17.5%	5.7%	11.8%
County of Peterborough/City of Peterborough	1.3%	0.4%	0.9%
City of Kawartha Lakes	3.1%	0.7%	2.4%
County of Simcoe/City of Barrie /City of Orillia	13.7%	7.3%	6.4%
County of Dufferin	9.4%	0.7%	8.7%
County of Wellington/City of Guelph	1.4%	4.2%	-2.8%
Region of Waterloo	0.0%	8.6%	-8.6%
County of Brant/City of Brantford	0.0%	1.2%	-1.2%
County of Haldimand	5.9%	0.2%	5.6%
Region of Niagara	12.4%	2.6%	9.8%
Total GGH	100.0%	100.0%	0.0%

Seven municipalities have a crushed stone deficiency. The seven municipalities are Durham Region (-1.9%), the Region of York (-19%), the City of Toronto (-12.6%), the Region of Peel (-12.5%), the County of Wellington (-2.8%), the Region of Waterloo (-8.6%), and the County of Brant (-1.2%).

All the municipalities are shown on the map in **Exhibit 4-7**. Municipalities with a crushed stone deficiency are shown in purple.

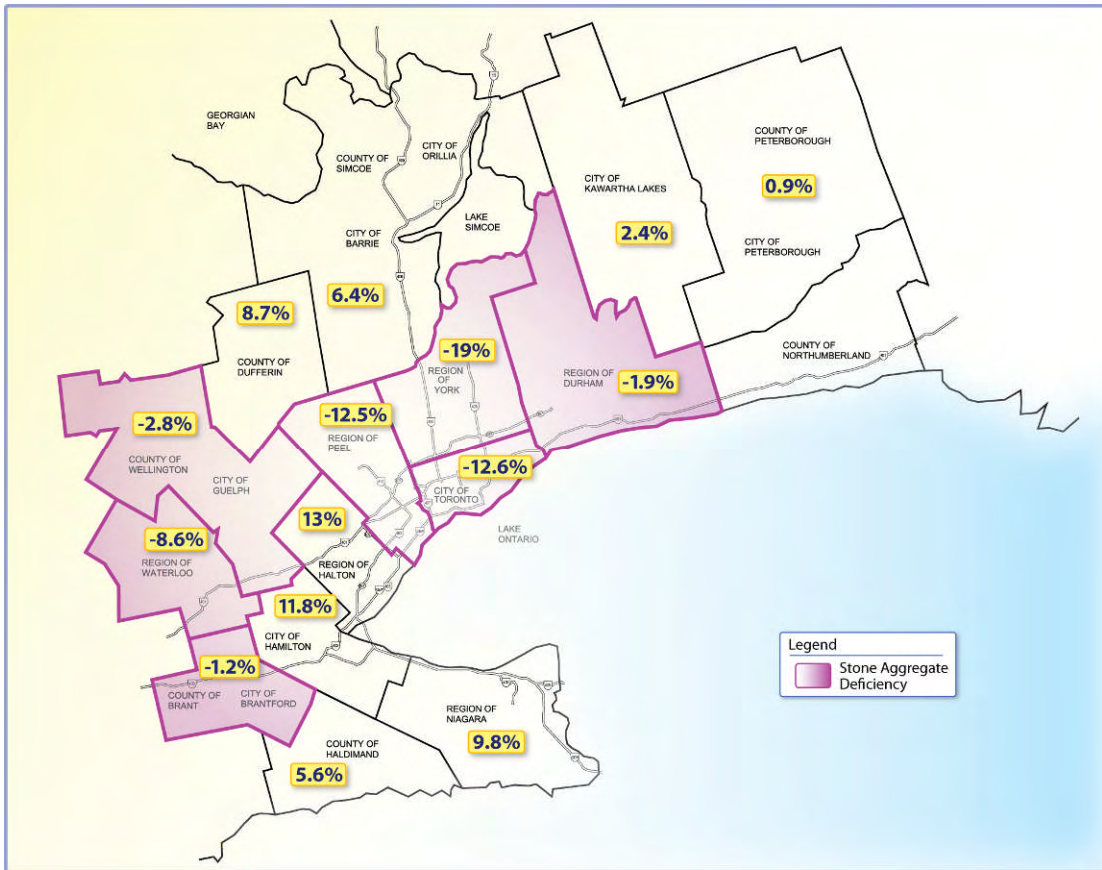


Exhibit 4-7: Areas with a Crushed Stone Surplus and Deficiency, 2007

If the deficient municipality is assigned to a geographical quadrant (relative to the location of the proposed quarry), and the quadrant's portion of the overall deficiency is calculated, the breakdown is as follows:

- Northwest (20.0 %)
 - County of Wellington
 - Region of Waterloo
- Northeast (78 %)
 - Region of Peel
 - Region of York
 - City of Toronto
 - Durham Region
- Southwest (2 %)
 - County of Brant
- Southeast (0 %)
 - (no deficient municipalities)

It is clear that most of the deficiency is in the northeast quadrant.

4.6.2 Reconciliation of Supply and Demand for Crushed Stone across Greater Golden Horseshoe

The information shown in **Table 4-8** and **Exhibit 4-7** was used to distribute the crushed stone from the surplus regions to the regions with deficiencies. The assumptions made to conduct the distribution were established to be reasonable and conservative.

The distribution of the aggregates was carried out and the crushed stone distribution was estimated by assuming that demand was first met from bordering municipalities that had a surplus and then by municipalities connected by a 400 series highway. The cells in the matrix show the percentage that we estimate will be transported between municipalities.

Table 4-8 presents a matrix that lists the crushed stone deficient municipalities across the top, and crushed stone surplus municipalities down the left side. After the distribution, two municipalities had a deficiency: the Region of York (-12.5 %), and the City of Toronto (-9.1 %).

Table 4-8: Matrix of Stage of the Crushed Stone Distribution for 2007

			Deficient Municipalities						Surplus Remaining
			Region of Durham	Region of York	City of Toronto	Region of Peel	County of Wellington	Region of Waterloo	
<i>Original Deficiency</i>			-1.9%	-19.0%	12.6%	-12.5%	-2.8%	-8.6%	-1.2%
<i>Resulting Deficiency</i>			0.0%	-12.5%	-9.1%	0.0%	0.0%	0.0%	0.0%
Surplus Municipalities	Halton Region	13.0%		1.5%	0.9%	6.0%	2.0%	2.6%	0.0%
	City of Hamilton	11.8%		1.5%	0.6%	2.5%			0.0%
	County of Peterborough	0.9%	0.4%						0.5%
	City of Kawartha Lakes	2.4%	1.5%						0.9%
	County of Simcoe	6.4%		2.0%		2.0%			2.4%
	County of Dufferin	8.7%				2.0%	0.8%		5.9%
	County of Haldimand	5.6%							5.6%
	Region of Niagara	9.8%		1.5%	2.0%				6.3%

Exhibit 4-8 provides a map showing how the distribution shown in **Table 4-8** was applied. The distribution is shown in red.



Exhibit 4-8: Crushed Stone Distribution for 2007

Exhibit 4-9 shows the final state of crushed stone deficiency in the GGH after the analysis.

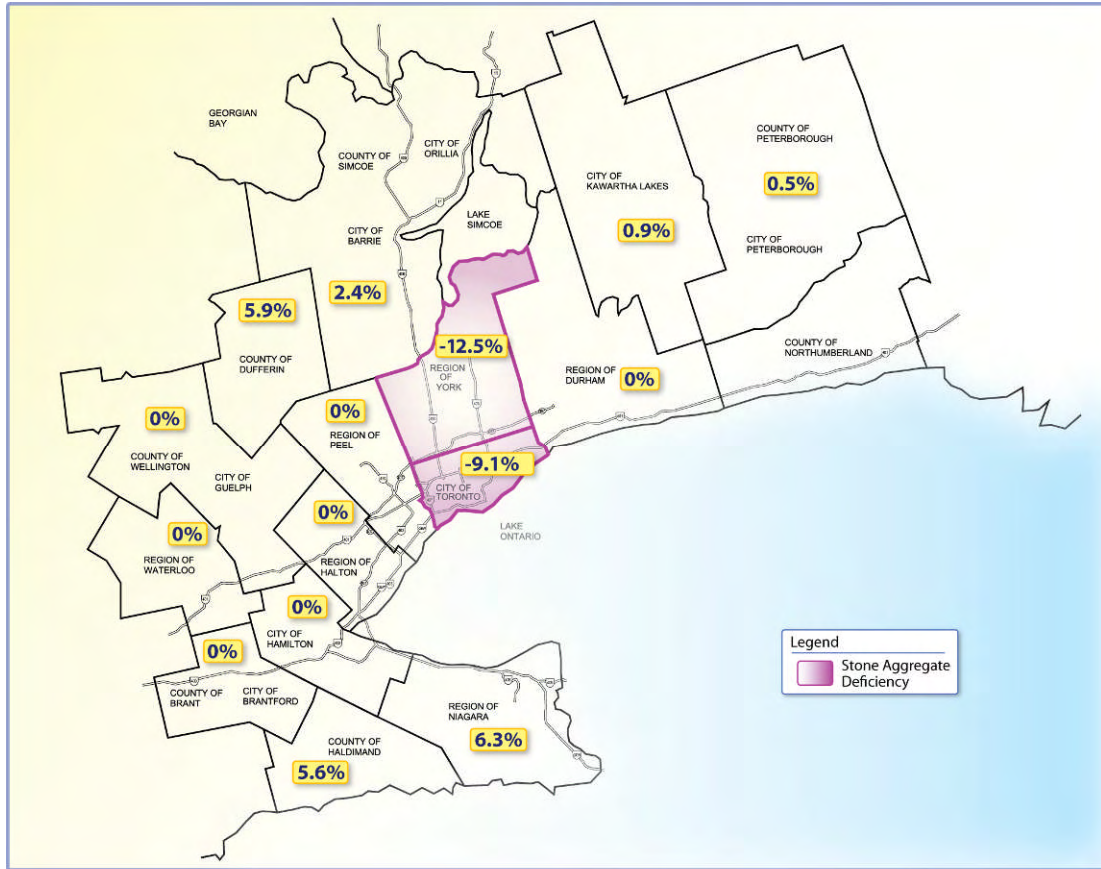


Exhibit 4-9: Final Demand for Crushed Stone, 2007

If the same quadrant breakdown used earlier is applied to the crushed stone deficiency values, it is clear that the northeast quadrant (which includes the Region of York and the City of Toronto) has 100 percent of the crushed stone deficiency.

Although the approach used in the distributions allocated all of the unmet crushed stone demand to the north east, the proposed distribution of Amabel Dolostone, as shown in **Exhibit 4-10**, takes the conservative view that some demand would also be unmet in other areas. The proposed distribution is made even more conservative given the locations of existing licensed quarries identified in red (**Exhibit 4-10**). For example, there is a licensed quarry in the south eastern quadrant of the study area that would be the most direct supplier to Burlington and another one on the west side of Highway 6 that would be most likely to service the Hamilton and Niagara corridor. Nonetheless, the proposed distribution of crushed stone from the proposed quarry was identified as:

- 75 % will be transported northeast
- 10% will be transported northwest
- 10% will be transported southeast
- 5% will be transported southwest

This distribution was applied to the 570 inbound and outbound truck trips from the proposed quarry (Table 4-9).

Table 4-9: Estimated Distribution of Quarry Trucks

Direction	Percentage	Quarry Trucks
Northeast	75%	430
Northwest	10%	55
Southeast	10%	55
Southwest	5%	30

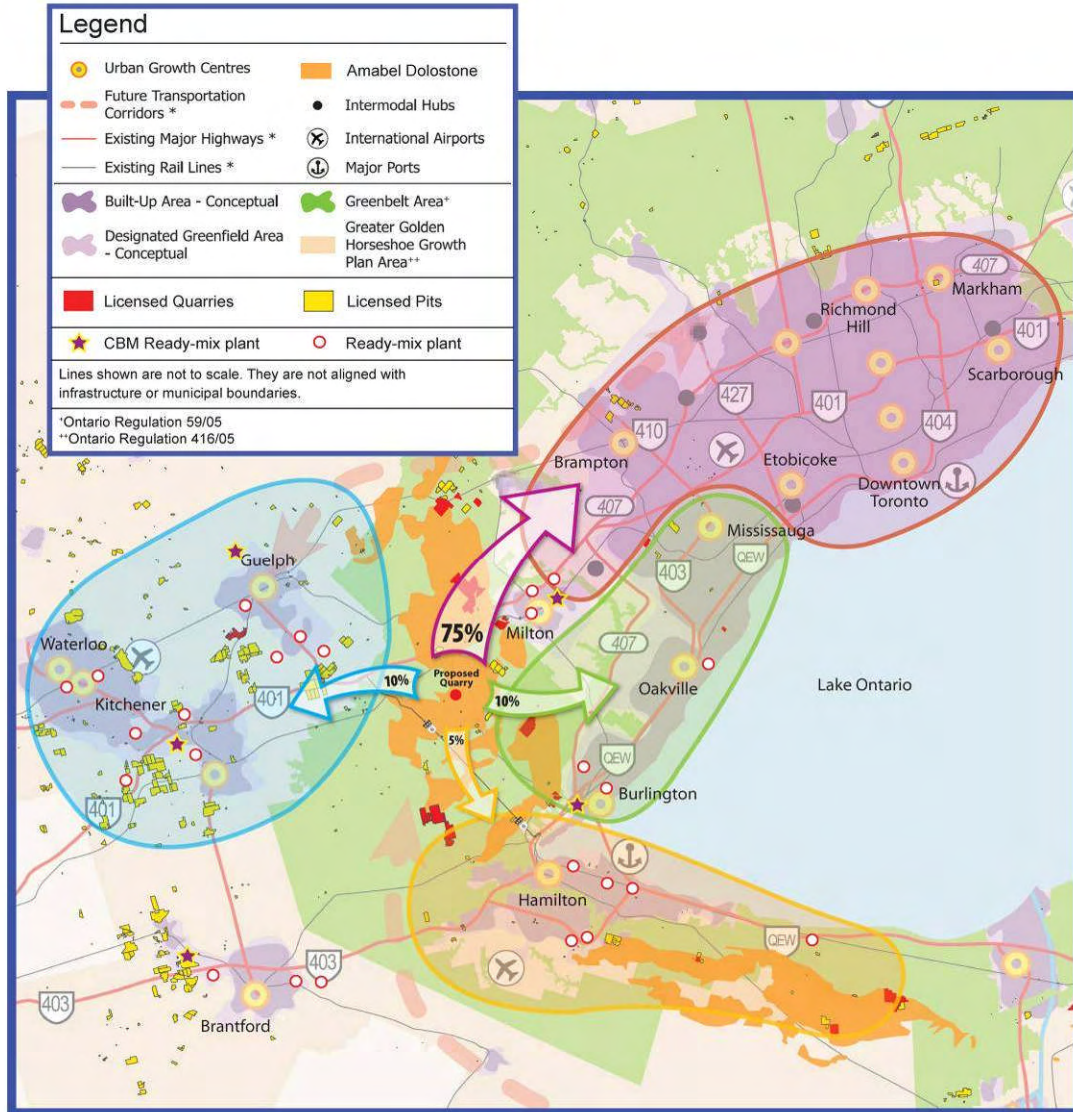


Exhibit 4-10: Proposed Distribution of Aggregate and illustration of Amabel Dolomite Deposits

4.7 Conclusion

To support the identified distribution patterns for the aggregate material from the proposed quarry, a review of regional sources and markets was undertaken. As detailed data are largely proprietary and unavailable for analysis, the study was limited to using the data available from the Ministry of Natural Resources and a limited number of other sources. It is, however, clear that Amabel Dolostone is not in abundant supply on a Regional level, and that it is in high demand due to its various uses in construction combined with the high rates of population and employment growth projected by the Places to Grow Growth Plan for the Greater Golden Horseshoe.

Deposits of Amabel Dolostone are concentrated in the Niagara Escarpment, Hamilton, Halton Region, and Grey County. Very few municipalities are able to obtain this type of aggregate from their own local resources.

After a careful and conservative analysis of the data available, the proposed distribution of Amabel Dolostone from the proposed St. Marys quarry was identified as follows:

- 75 % will be transported northeast
- 10% will be transported northwest
- 10% will be transported southeast
- 5% will be transported southwest

5. ALTERNATIVE TRANSPORTATION SOLUTIONS

In keeping with the Terms of Reference for this study, the study team undertook a review of alternative modes/solutions for the transportation of quarried material from the proposed St. Marys site. Two main transportation alternatives were considered:

- Rail
- Road

Given the character of the Amabel Dolostone market, it is expected that the proposed quarry will largely serve customers in the Region of York and the City of Toronto to the northeast of the quarry. The quarry will serve multiple customer destinations. These destinations can change constantly as a result of construction projects reaching completion and new projects being started.

The following sections outline the economic and environmental implications of adopting a rail or road transportation solution. As required by the Terms of Reference, special attention is given to the environmental implications.

Section 5.1 considers aggregate production and transportation policy in Southern Ontario. **Section 5.2** examines the implications of choosing rail. **Section 5.3** considers two rail options (a northern spur and a southern spur from an existing rail line). **Section 5.4** considers the environmental implications of the two rail options and the need for supporting new rail facilities at the quarry site. **Section 5.5** examines the implications of choosing road. **Section 5.6** summarizes the analysis of road and rail options, and selects the preferred mode of transport.

5.1 Aggregate Production and Transportation Policy in Ontario

The City of Hamilton and the Ministry of Natural Resources (MNR) provide insight into Ontario's policy regarding the production and transportation of aggregates.

MNR emphasizes the economic and environmental importance of minimizing hauling distances: "Approximately 85% of total aggregate production takes place in southern Ontario where the demand for aggregates and aggregate-derived products is the highest. The cost of transportation is estimated to be approximately 60% of the total cost of aggregate. Therefore, the economic value of an aggregate deposit is based not only on the quantity of the deposit, but also how close the deposit is to its final destination. Extracting aggregate resources close to where they are being utilized can also be considered the most environmentally sensitive

alternative. Trucking resources long distances increases greenhouse gas emissions, which is one of the top environmental concerns in the world today¹⁷.”

The City of Hamilton’s Goods Movement Policy Paper¹⁸ points out that “The rail mode is primarily used for long distance bulk good” and that “the opportunity for expansion of short-haul rail services in the GTA and City of Hamilton area is limited.” The paper also points out that “it is estimated that two-thirds to three quarters of the truck traffic movements in the GTA and Hamilton are captive markets since they cannot be served by rail.” The paper recognizes that “The biggest opportunities for rail are probably in the intermodal sector, moving goods manufactured and assembled in the GTA and City of Hamilton area and surrounding areas to and from other locations across Canada.”

Although policy appears to favour road haulage for short distance, the project team considered rail as well as road haulage for the proposed quarry.

5.2 Rail Alternative

The single greatest advantage to using trains to transport aggregates from the quarry is that there would be relatively few aggregate trucks in the vicinity of the quarry. As suggested in **Section 5.1**, there are, however, a number of serious problems associated with rail:

- In particular, most aggregate customers do not have access to rail service. Rail does not serve most of the quarry’s potential near term customers.
- New markets for aggregates are also unlikely to be served by rail.
- The rail alternative implies using trains to transport the aggregates from the quarry to:
 - A few destinations with direct rail access
 - A transfer station (possibly more than one transfer station), and then by truck to multiple destinations
- As there is no existing rail service at the quarry site, it would be necessary to construct a new rail spur from the existing Canadian Pacific (CP) rail line to the quarry. It is estimated that the rail spur would be one to two kilometres long and would require significant new construction and substantial land acquisition.
- A new spur line might have an environmental impact on the lands affected by construction and operation.
- To reach the quarry, a new spur line would require a new level rail crossing (on Milborough Line).
- New aggregate handling and transport facilities would be required at the quarry
- New aggregate handling, transfer and transport facilities would be required at each customer’s site the quarry.

¹⁷Ministry of Natural Resources, “Managing Aggregate Resources.”
http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/STEL02_167024.html. (August 13, 2008)

¹⁸ IBI Group, “Development of Policy Papers for Phase Two of the Transportation Master Plan for the City of Hamilton Goods Movement Policy Paper-Final Report,” January 2005.

- If aggregates are transported to a transfer station and then transported by truck to individual customers who have no rail service, land would be required for the transfer station, and new handling, transfer and transport facilities would be required at the transfer station.
- The transfer station option requires triple handling of the aggregate material. Aggregates must be brought by truck to quarry railhead, transferred to the train, and then transferred back to a truck to travel to the final destination. Multiple handling of material is not efficient, adds to the cost of the material, and increases delivery times.

5.3 Two Options for Building a Spur Rail Line to the Quarry Site

Despite the business and logistical problems associated with rail, the possibility of bringing a spur line to the quarry site was examined in detail. The analysis examined the environmental impact of a spur line. Land ownership and other non-environmental factors were not considered.

Exhibit 5-1 shows the ecological land classification (ELC) mapping completed for the property and surrounding area. (The map was created by Stantec Consulting.)

Exhibit 5-1 shows the natural features that might be affected by choosing rail to transport the aggregates. The natural features include:

- Provincially Significant Wetlands (PSWs – Ministry of Natural Resources (MNR))
- Ecologically Sensitive Areas (ESAs – City of Hamilton)
- Deer wintering areas (MNR)
- Watercourses

There are two rail lines in the study area: the CP Hamilton Subdivision, and the CP Galt Subdivision. The CP Hamilton Subdivision runs roughly north-south just east of Centre Road, and then intersects Milborough Line near Concession 10 E and McNiven Road at 3rd Sideroad before intersecting the CP Galt Subdivision at Guelph Junction. This line is shown in black in **Exhibit 5-1**. The CP Galt Subdivision runs east-west crossing Campbellville Road just east of Twiss Road and remaining north of Campbellville west of Twiss Road. This line is shown in **Exhibit 3-1**.

The new rail spur would run east from the site and connect to the CP Hamilton Subdivision. Two alignments were considered. The northern option (marked in red and labelled 1 in **Exhibit 5-1**) is discussed in **Section 5.3.1**. The southern option (marked in red and labelled 2 in **Exhibit 5-1**) is discussed in **Section 5.3.2**. These two alignments were selected to avoid ESAs, PSWs and deer wintering areas as much as possible.

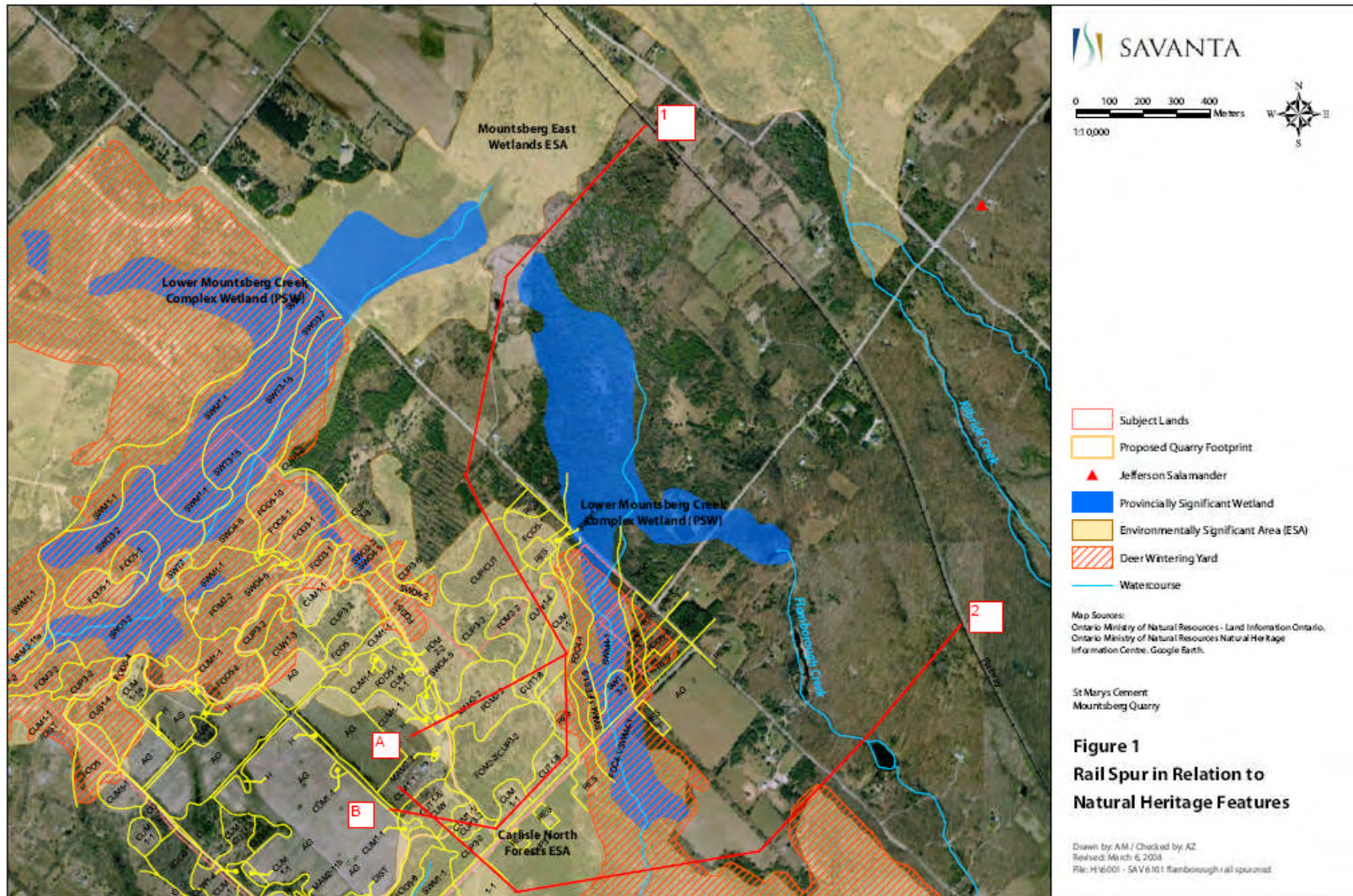


Exhibit 5-1: Potential Rail Spur in Relation to Natural Heritage Features

5.3.1 Rail Spur 1 – Northern Route Option

The northern rail spur option is 2.2 km long and crosses through woodland, but avoids intrusion into the ESAs and the deer wintering areas. The spur includes one road crossing, at Milborough Town Line. It enters the quarry property from the north and travels south and then west into the quarry property, mainly through disturbed cultural vegetation communities (plantations, woodland, thicket, and meadow). Intrusion into the more mature woodland communities is minimized. Where the cultural communities end, the rail spur traverses a band of more mature woodland before entering the proposed quarry footprint.

Two options (A and B in **Exhibit 5-1**) for crossing the more mature woodland were considered. Option A is shorter and cuts through a woodland unit that is less mature than surrounding units. Detailed field inspections suggest that Option A would have limited effects on the ecological characteristics of the remaining woodland. Option B passes through an area dominated by cultural communities, but we understand that limited space is available for the spur (i.e. the area would be constrained by berm construction, etc.).

5.3.2 Rail Spur 2 – Southern Route Option

The southern rail spur option is 1.7 km long. The alignment includes two road crossings, the first at Milborough Town Line to the west, and the second at 11th Concession to the north. The southern alignment travels from the main line through a treed swamp/lowland forest and a coldwater tributary of Flamboro Creek (i.e. a fish habitat). After crossing the Town line, but before the 11th Concession, the alignment passes through a deer wintering yard, and then crosses a second tributary of Flamboro Creek. After entering quarry property, the rail spur crosses a cultural meadow and a short band of mature woodland (White Pine Plantation) before reaching the quarry footprint.

5.4 Environmental Implications of the Rail Spur Options and New Rail Facilities at the Quarry Site

Table 5-1 summarizes the two rail spur options' key intrusions into natural features. Both alignments have effects on the local landscape and the natural heritage features and functions. The table shows that the northern alignment has fewer environmental effects than does the southern alignment.

Table 5-1: Key Intrusions into Natural Features

CRITERIA	NORTHERN ALIGNMENT	SOUTHERN ALIGNMENT
Approximate length	2.2 km	1.7 km
Intrusions into ESA	Yes – similar extent	Yes – similar extent
Intrusions into Deer Wintering Area	No	Yes – through approximately 300m of delineated habitat
Watercourse Crossings	No	Two
PSW Intrusions	None	None
Woodland Intrusions	Yes - similar	Yes - similar

Although the northern alignment minimizes the potential for direct environmental effects, the use of rail would require the creation of loading facilities (and perhaps other ancillary features) that would consume some additional lands and would result in additional indirect environmental effects.

The potential direct and indirect environmental effects of using rail are:

- Some forest removal (mature and cultural communities)
- Intrusions into the ESA
- Removal of some area of cultural meadow east of Milborough Line

The final extent of the rail spur options' environmental effects can, of course, only be assessed when final designs and alignments are considered.

5.5 Road Alternative

Road is the most common transportation choice for aggregates because transporting aggregates by truck has some important advantages over rail:

- As road transport is highly flexible, it is easy to serve multiple destinations directly from the quarry, and it is easy to accommodate changing customer patterns and requirements.
- Only one mode of transport is required, eliminating the need for transfers between train and truck.
- Road is regarded as the most cost-effective mode of transport.
- If road transportation is chosen, it is not necessary to build a new rail spur line through the surrounding natural environment.
- If road transportation is chosen, the need for expensive new rail infrastructure is minimized.

Road is also associated with several disadvantages. Truck traffic would increase on the designated haul route(s) in the vicinity of the quarry. Additional truck traffic implies an increase in traffic delay, congestion, noise, dust, vibration, and other disturbances to residents. Safety and the potential impact on the community and the natural environment must also be considered.

5.6 The Preferred Mode of Transport

The advantages and disadvantages of rail and road transportation, and the policies of MNR and the City of Hamilton were reviewed. The findings suggest that the preferred mode of transportation for the proposed quarry's aggregates is road.

The transport of aggregates by truck from the quarry directly to customers has major advantages in terms of cost and efficiency. In particular, only trucks can transport the aggregates directly from the quarry to each customer. In addition, the environmental disadvantages of trucks (upgrading of roads, increased traffic, and various types of pollution) are not overcome by choosing rail as an alternative. Mitigating measures will, of course, be introduced to counter the environmental disadvantages of trucks.

The cost advantages of hauling heavy loads by rail do not apply to the short distances between the proposed quarry and most of its customers. Rail would require investment in a new spur line from the quarry to the existing rail line. Even if this spur were built, most customers would still require truck delivery. As a result, rail requires investment in a new spur line, new rail facilities at the quarry site, and a transfer station (possibly more than one transfer station) where the aggregates would be transferred to trucks for delivery to multiple destinations.. The new rail line and supporting infrastructure would require an additional level rail crossing across Milborough Line, and would be at the expense of environmentally sensitive habitats including mature woodland, areas used by deer, meadows, and watercourses used by local fish species.

6. QUARRY TRIP GENERATION

6.1 Quarry Operations

The expected start of operations for the proposed Flamborough Quarry is subject to the timing of approvals. The quarry is proposed to operate year round, 12 hours per day Monday to Friday and 6 hours on Saturdays.

The estimated breakdown of truck types accessing the quarry is as follows:

- 40 tonne trailer 0%
- 35 tonne trailer 38%
- 23 tonne tri-axle 44%
- 12 tonne tandem 7%
- 3-6 tonne 11%



Photo 4 - 1: 35 Tonne Trailer Configuration

6.2 Quarry Trip Generation

6.2.1 Estimates for the Generation of Site Truck Traffic

In order to estimate the truck traffic that may be generated by the proposed Flamborough Quarry, a detailed review of tickets from three other existing pits in the general area was undertaken. The ticket information included the date of the ticket and the product name and quantity. From this information, specific assumptions can be developed and confirmed as described in this section.

The number of trips to be generated by the proposed quarry was identified by sorting the number of loads for a proxy location from highest to lowest and then selecting an appropriate percentile day.

An 85th percentile day was selected resulting in an estimated 570 trips into and 570 trips out of the quarry each day. The 85th percentile is a common threshold used in other applications within transportation engineering (such as setting speed limits or establishing design hours).

The number of trips generated by the traffic accessing the proxy location does not vary appreciably by day of week. Further there is no specific correlation in the proxy data associated with the number of trips generated and the month of the year. There are numerous representative days in August (the peak month for background traffic) that are very close to the selected 85th percentile day for site traffic. As a result, no further day of week or month of year factors were applied.

A proxy location provides a realistic and reliable measure of the characteristics of the expected truck types accessing the proposed quarry. The use of this data accounts for trucks that are not necessarily loaded to capacity and so provides for a more conservative estimate of trips generated by the quarry. The truck fleet distribution adopted for estimating the generation of site truck traffic is described in **Section 6.1**.

It is acknowledged that the use of double-trailers may increase in the future but only single unit dump trucks were used to provide a more conservative estimate of trips generated by the quarry. Both single unit and double-trailer trucks were used as design vehicles for the intersection geometric design.

If it is assumed that the quarry will operate for 5.5 days per week (based on hours of operation – 12 for Monday to Friday and 6 for Saturday), the result is a total for site generation very similar to what has been provided to the public and used in previous studies and is summarized as follows.

During an average maximum day, it is estimated that there will be 1140 truck trips consisting of 570 inbound and 570 outbound truck trips. The average maximum day is defined as a day when the number of trips exceeds the average daily per day by 35%. Therefore, the typical number of truck trips is much lower.

Based on aggregate operations elsewhere in Ontario ⁸, 12% of the shipping traffic travels during the AM peak hour and 10% during the PM peak hour. Peak hour refers to the street peak hour and not the facility peak hour. Therefore, during the AM peak hour, the proposed Flamborough Quarry is estimated to generate 70 trucks entering and 70 exiting. During the PM peak hour, it is estimated to generate 60 trucks entering and 60 trucks exiting. This is based on the assumption that the quarry is operating at maximum capacity (i.e. at the tonnage maximum of three million tonnes/year).

The distribution of quarry truck traffic is provided in **Section 5.6** following discussion on aggregate supply and demand.

⁸ Walker Environmental Assessment, Traffic Impact Assessment, iTRANS Consulting, February 2006

6.2.2 Employee Trip Generation

The employee trip generation was derived based on staffing requirements, which were provided by St. Marys. The quarry will require approximately 30-35 staff to operate the quarry per shift. Staff typically work in 12-hour shifts. In addition to the staff, about 10-20 contractors can be anticipated for operations, maintenance and other miscellaneous tasks during the day. These trips are assumed to occur outside of the peak hours. To be conservative, we have assumed 35 employees for the peak AM and PM hours. The employee trip generation is summarized in **Table 6-1**.

Table 6-1: Quarry Employee Trip Generation

Time Period	In (vph)	Out (vph)
AM Peak	35	5
PM Peak	5	35

To be conservative, we assumed all trips for the 35 employees occur in the peak periods and a nominal 5 trips leaving to account for pick-up/drop off.

The trip distribution for the employee components of the development was based on a review of the information provided in the *2006 Transportation Tomorrow Survey* (TTS) conducted by the University of Toronto Joint Program. The review looked at the number of trips from all the TTS planning districts to the Flamborough district. The results were filtered based on work trips and a start time of between 6:30am to 9:30am. A summary of the raw TTS output is shown in **Table 6-2**.

Table 6-2: Raw TTS Output Summary

Trip Origin	Number of Trips	% of Distribution
Flamborough	1832	37.9%
Hamilton	956	19.8%
Burlington	591	12.2%
Cambridge	258	5.3%
Dundas	233	4.8%
Brantford	145	3.0%
Stoney Creek	127	2.6%
Ancaster	126	2.6%
Mississauga	124	2.6%
Brant	99	2.0%
Halton Hills	72	1.5%
Guelph	51	1.1%
Waterloo	36	0.7%
Puslinch	24	0.5%
Brampton	23	0.5%
Markham	20	0.4%
St Catharines	19	0.4%
Kitchener	19	0.4%
North Dumfries	18	0.4%
PD 8 of Toronto	17	0.4%
Milton	17	0.4%
Oakville	16	0.3%
Glanbrook	16	0.3%
Total	4839	100.0%

The trips were divided based on the likely travel route to the site. For the trips that originate in Flamborough, population density was used to determine trip location and then trips were assigned to the network based on the probable route. The employee trip distribution and assignment for the proposed development is summarized in **Table 6-3**.

Table 6-3: Quarry Employee Trip Distribution

Direction: To/From	Via	In/Out
East	Highway 401 via Guelph Line	3.8%
	Parkside Drive	4.7%
	Dundas Street	4.7%
West	Highway 401 via Highway 6	7.7%
	Concession 11 East	3.8%
North	Highway 6	1.0%
South	Highway 6	49.6%
	Centre Road	18.9%
	Milburrough Townline	5.7%
Total		100%

The quarry employee site peak hour traffic volumes are shown in **Exhibit 6-1**.

Exhibit 6-1: Quarry Employee Site Traffic

To be inserted

7. ALTERNATIVE STRATEGIES FOR QUARRY TRUCKS

7.1 Alternative Strategies

There are two alternative strategies for quarry trucks. The selected alternative strategy will have a considerable influence on the selection of alternative haul route(s). The following section explains each alternative strategy in detail.

7.1.1 Alternative Strategy 1 – Quarry Trucks Permitted To Use Available Truck Routes



One option for the proposed quarry is to allow trucks to travel on roads where trucks are currently permitted but subject to load restrictions. Since Concession 11 E and Milborough Line are located adjacent to the proposed quarry, they are included for this alternative strategy as routes that would be available to trucks. These roads are illustrated in **Exhibit 7-1**.

By allowing trucks to use the shortest routes, this alternative has the major advantage of minimizing transport costs, road upgrades, and greenhouse gases emissions.

However, this alternative of permitting quarry trucks to use any available truck route where they are currently permitted is not being carried forward for two main reasons. The first reason is that truck traffic would increase on many more roads throughout the study area. The second reason is that the quarry truck traffic would affect many more residents within the study area.

Exhibit 7-1: Long List of Alternative Haul Routes

For these reasons, St. Marys is proposing a different strategy involving designated haul routes which would prohibit quarry trucks from using any road that is not a designated haul route.

7.1.2 Alternative Strategy 2 – Quarry Trucks Must Use Designated Haul Routes

St. Marys is proposing a haul route strategy for the proposed quarry, where quarry trucks would be compelled to travel on designated haul routes only. Quarry trucks would be prohibited from using any road that is not part of a designated haul route.

How can St. Marys compel quarry trucks to use only the designated haul route? Optional measures could include, but not be limited to:

- Traffic signage to designate the haul route(s);
- Truck prohibitions on roads that are not part of the haul route(s);
- Enforcement using hired police;
- Penalties for truckers who deviate from the designated haul route(s);
- “Hot line” for residents to call about quarry trucks that deviate from the designated haul route(s); and
- Additional options to compel trucks to use the designated haul route(s) are being considered.

7.2 Tools to Control Truck Traffic

One of the issues that has been raised is ensuring that truckers adhere to the designated haul route(s). At other locations, St. Marys has found that a process that is centred on their Truck Haulage and Safety Policy has been effective. The following sections outline St. Marys’ truck policy and provides a case study of how it was effectively applied at their Limehouse Pit.

7.2.1 St. Marys Truck Policy

The following outlines CBM Aggregates, a division of St. Marys Cement Inc. (Canada) (“CBM”), Truck Haulage and Safety Policy that was first issued in June 2004 and revised in March 2007.

7.2.1.1 Purpose

This policy is designed to ensure:

- the occupational health and safety of all of CBM’s employees, carriers, independent brokers, independent contractors and members of the public; and
- independent truck drivers hauling material off CBM property shall follow prescribed rules on and around CBM’s operations.

CBM is committed to meeting or exceeding all of the legal requirements, duties, and the standards set by the applicable provincial health and safety legislation and highway traffic legislation.

7.2.1.2 Scope

Geographical: This policy is not limited specifically to CBM's sites, but also extends to the arterial routes that surround all of CBM's operations.

Persons Covered: This policy applies to:

- all carriers, independent brokers, independent contractors engaged to haul aggregates for CBM (referred to herein as "Carriers"); and
- CBM employees.

7.2.1.3 Responsibilities and Tasks of Carriers

Carriers will comply with the following rules, and will be responsible to ensure that all of their employees, agents or contractors who drive trucks will comply with the following rules:

1. Compliance with Policy and Laws. All drivers must have a full understanding of CBM's Aggregates Truck Haulage & Safety Policy, as amended from time to time, the Ontario Occupational Health and Safety Act, the Highway Traffic Act and its regulations, and adhere to the safe work procedures as detailed therein. Carriers will abide by all applicable federal, provincial, municipal laws and regulations, including by-laws and hours of operation.
2. Trucks shall not pass vehicles of any class on entrance haul roads at any CBM location and must observe the right of way.
3. There is no unnecessary stopping or parking on entrance inclines at any CBM location. In the event of breakdown, trucks must have wheels chocked and display warning flares or reflective indicators.
4. All trucks must be equipped with a properly functioning backup safety alarm and be maintained in accordance with the provisions of the *Highway Traffic Act*, and its regulations.
5. Drivers must remain in their vehicles at all times when on CBM property except for the following designated areas: overload areas, scale house, tarping areas and "Designated Areas".
6. When drivers are out of their vehicles in the Designated Areas they must wear a safety vest, safety footwear and it is strongly recommended that drivers take reasonable precautions by wearing hard hats as well.
7. Drivers must tarp and inspect all loads, clean loose material from tailgates and sideboards at the tarping or overload areas only.
8. Drivers must obey all signs posted on CBM property and follow instructions issued by CBM staff while on CBM property.

9. After a load has been completely emptied at the stockpile area, the box must be lowered completely before the driver leaves the area. Under no circumstances should a driver have the truck in motion while the box is being lowered.
10. The use of intoxicating substances such as drugs and alcohol will not be permitted at CBM locations at any time. Persons under the influence of any intoxicating substance will not be allowed entry to CBM property.
11. CBM reserves the right to refuse to issue a weigh bill to a driver if the truck exceeds its gross allowable weight limits, or the driver cannot supply information as required.
12. Vehicles in excess of their MTO Gross Weight Documentation must dump surplus material before a loading ticket will be issued, with no exceptions.
13. Trucks must tare in every day. These measures are necessary to comply with the ***Ontario Highway Traffic Act***.
14. For any change in trailer configuration, drivers must supply a new Gross Allowable Weight document issued by the Ministry of Transportation to each CBM location that the truck hauls from.
15. All drivers must be aware of Ontario Regulation 213/91, as amended by Ontario Regulation 628/05, Construction Projects, made under the ***Occupational Health and Safety Act***, (“Construction Projects Regulation”), regarding safe distances from overhead power lines.
16. Drivers must be polite and courteous to local residents and avoid excessive engine noise including the use of engine brakes, except where safety considerations would merit such use.
17. When specified for a particular site, trucks are expected to follow designated haul routes.
18. Drivers must sign all free on board (FOB) tickets at the time of issue. All delivery tickets must be signed by the drivers and customers and returned to a CBM location preferably by the next business day.
19. Documentation Requirements. All Carriers must have, and supply CBM with, the following information upon initial entry onto the CBM premises (the “work place”), and thereafter upon request of CBM :
 - a) Valid Driver’s License for the class matching the type of vehicle driven;
 - b) Ministry of Transportation Registered Gross Weight documents;
 - c) A copy of vehicle permit (showing the owner of the vehicle and the registered gross weight of the vehicle);
 - d) Proof of Insurance coverage, minimum of \$2,000,000 (TWO MILLION DOLLARS);
 - e) Valid Workplace Safety and Insurance Board (“WSIB”) Clearance Certificate renewed every sixty days, or Independent Operator Clearance Certificate;
 - f) Proof of valid C.V.O.R. certificate, maintained at an acceptable violation rate in accordance with the Ministry of Transportation’s “Ontario’s Safety Rating and Commercial Motor Vehicle Registration System Public Guideline”; provide a CVOR level II abstract upon request; and
 - g) Proof of a current valid Annual Inspection Sticker and Certificate issued pursuant to the ***Highway Traffic Act***.

7.2.1.4 Violations by Carriers

Carriers which violate any of these rules will receive a maximum of two warnings. CBM will verbally warn the driver and will send a written warning to the Carrier. In the event that a third warning is given to any given driver, CBM reserves the right to:

- a) refuse to load a truck operated by that driver at any or **ALL** CBM locations;
- b) require that the Carrier replace that driver for any haulage services to be provided for CBM; or
- c) terminate its agreement with the Carrier.

In the event of a serious infraction of this policy, CBM reserves the right to suspend a driver's loading privileges without issuing any prior warnings.

7.2.1.5 Responsibilities of CBM Employees

CBM employees who deal with Carriers have a responsibility to:

1. Ensure Carriers and drivers follow the policy set out above;
2. Immediately report trucks that do not follow this policy by way of the Contact Record Form. This form shall be submitted to the appropriate CBM personnel. Upon receiving the Contact Record Form, CBM shall take appropriate action to correct the infraction; and
3. Make certain that there are no exceptions to this policy.

St. Marys works diligently to monitor and enforce the above policy and takes corrective action if necessary. If a complaint is filed and corrective action is required a Contact Record Form is issued that documents the date of the complaint, person complaining, explanation of their concern, and action taken to correct their concern. This process results in a corrective action and a routine follow up is carried out.

7.2.2 Limehouse Pit Case Study

It is our recommendation that a designated haul route is the best approach combined with St. Marys Truck Haulage and Safety Policy. This policy has been applied successfully at other locations such as the Limehouse Pit in Halton Hills.

The Limehouse Pit is located north of the 401 close to the village of Limehouse. The site had many unique challenges and resulted in a single haul route that requires all trucks travel east from the site regardless of which direction they need to go. The haul route is from Highway 7 onto Sideroad 22, through the village of Limehouse to 5th Line. The main entrance is on 5th Line (**Exhibit 7-2**).



Exhibit 7-2: Location and Haul Route Illustration for the Limehouse Pit

St. Marys encourages local residents to call them directly with concerns about the quarry trucks and whenever possible provide them with the license plate number in order for them to take the appropriate action. This has been effective in the past to keep trucks on the designated haul routes. The feedback from the local municipality was encouraging stating, “Halton Hills staff has experienced positive corporate responses from CBM SMC to haulage related issues.” Local police explained that no issues have been brought to their attention concerning trucks not adhering to the designated haul routes.

Based on previous successes and benefits of using a designated haul route, Alternative Strategy 2 was selected and carried forward in the haul route evaluation.

7.2.3 Design Features

Wherever possible, the design of recommended road alterations will facilitate truck movements in the direction of the selected alternative haul route and inhibit un-designated movements. In combination with signage, these measures would include the strategic use of geometric design tools, raised medians, and concrete curb and gutter features in the design of the site access and recommended intersection alterations.