Welcome

to this

Public Information Session

(Public Information Centre #4)

Monday, June 23rd, 2008

for the

St. Marys Flamborough Quarry

Haul Route Study

Please sign in

Presentation at 7:30 pm followed by a question and answer period.

Members of the Project Team are available to discuss the project with you.
Please feel free to ask questions.

We encourage you to complete a comment sheet before leaving.
Please indicate if you would like to be included on the mailing list.

Contact Information:
Telephone: 1-866-602-0080 (toll free)
Email: communityinfo@stmaryscbm.com
Website: www.flamboroughquarry.ca

ST MARYS

Purpose of This Public Information Centre

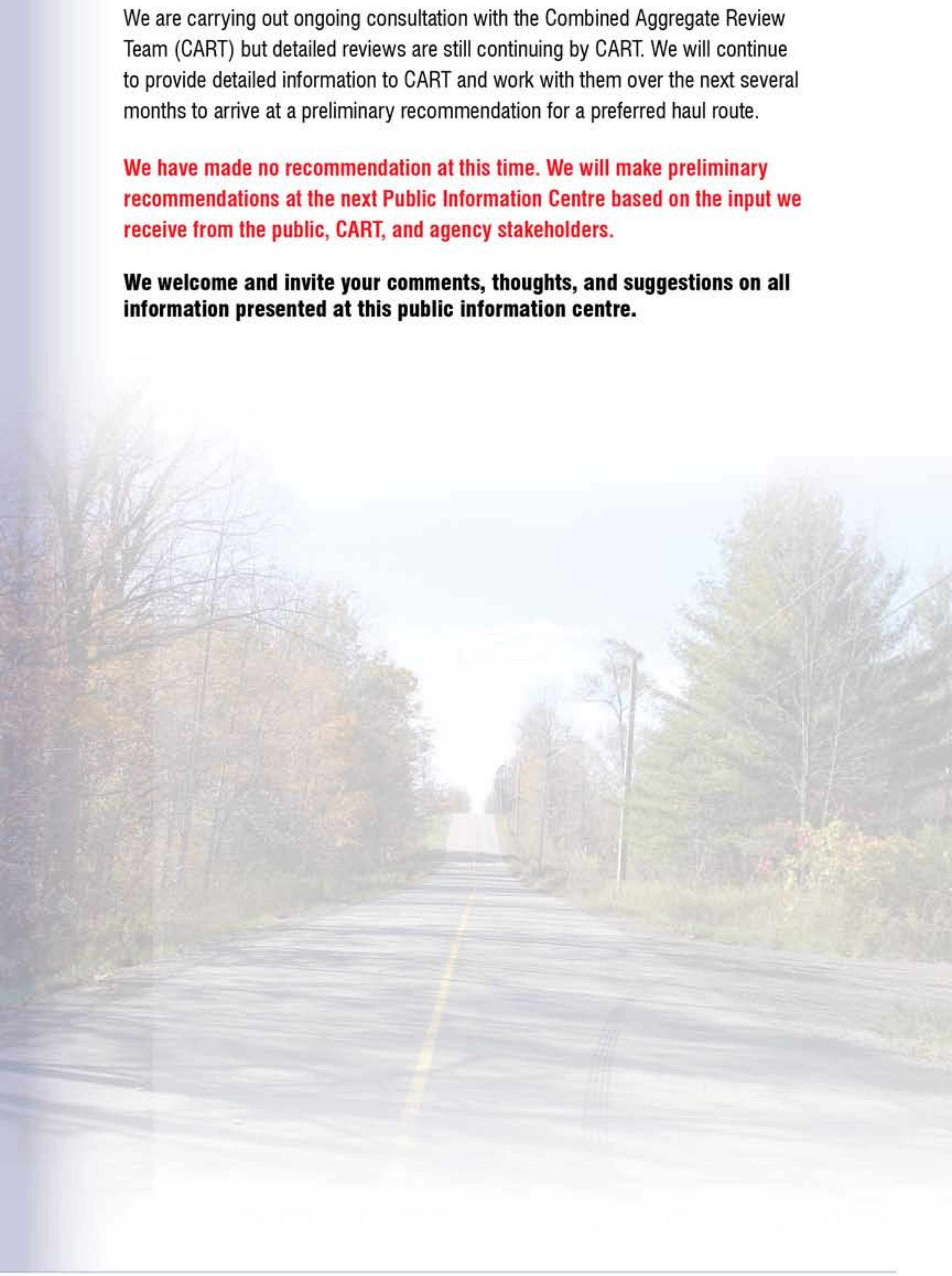
The purpose of this public information centre is to:

- Summarize comments received to date from the public, and how they have been addressed
- Share our interim analysis of impacts of the alternative haul routes
- Share our interim evaluation that compares the alternative haul routes
- Share our interim findings
- Obtain your comments and input on the information presented in this public information centre
- Outline future steps in the study

We are carrying out ongoing consultation with the Combined Aggregate Review Team (CART) but detailed reviews are still continuing by CART. We will continue to provide detailed information to CART and work with them over the next several months to arrive at a preliminary recommendation for a preferred haul route.

We have made no recommendation at this time. We will make preliminary recommendations at the next Public Information Centre based on the input we receive from the public, CART, and agency stakeholders.

We welcome and invite your comments, thoughts, and suggestions on all information presented at this public information centre.



Project Description

St. Marys Cement (SMC) is proposing a new limestone quarry on a 158 hectare site located in the City of Hamilton (in the former Township of Flamborough), north of Concession 11 E between Centre Road and Milburough Line.

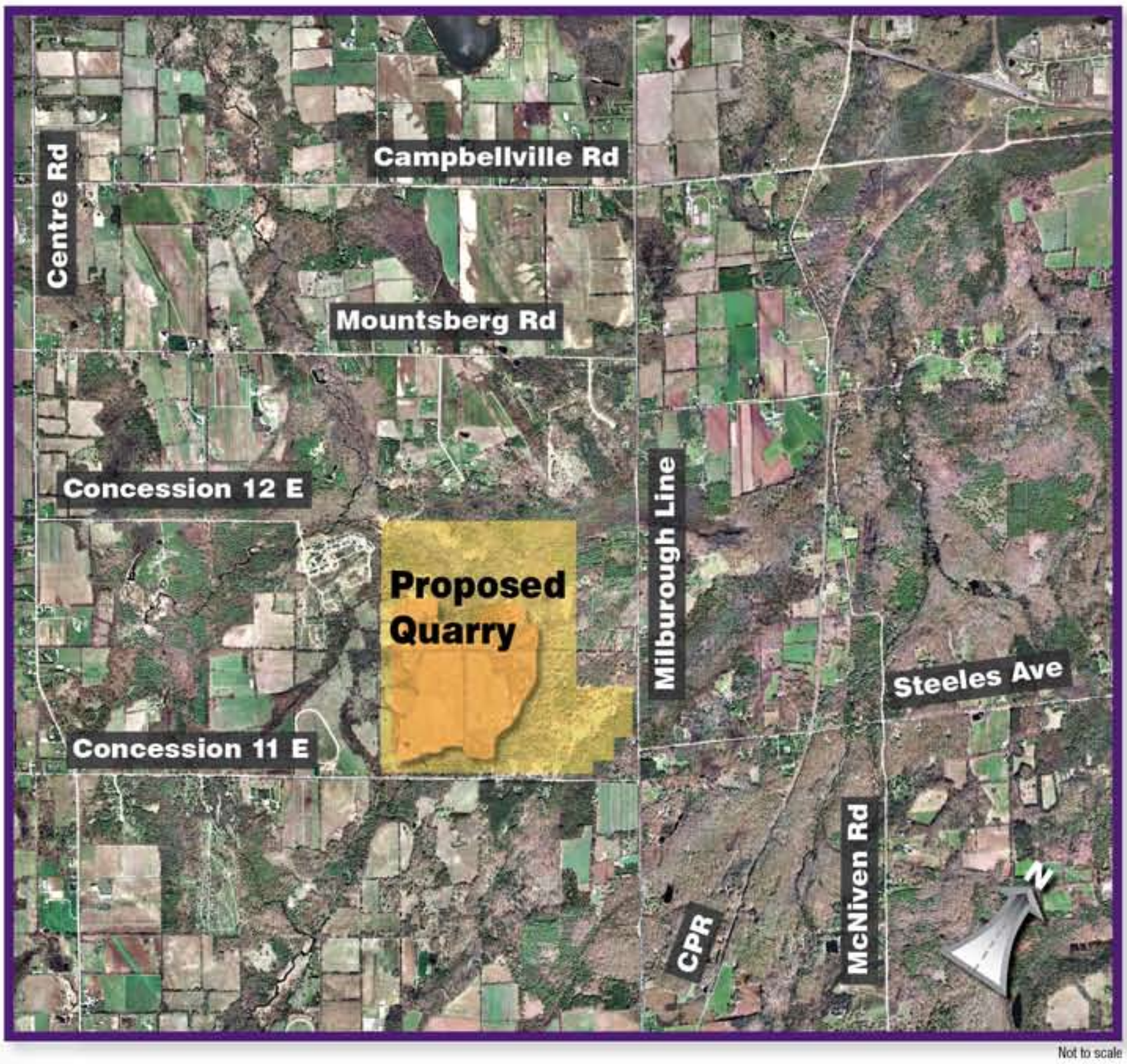
The quarry would supply a variety of construction aggregate products for use in roadway building and other infrastructure projects, residential, industrial and commercial construction sites within the Greater Golden Horseshoe area.

Over 50% of aggregates produced in Ontario are used by public authorities for the construction and maintenance of public infrastructure (Source: Ministry of Natural Resources).

The proposed quarry could supply up to 3 million tonnes of aggregate materials annually.

Dolostone is the most durable aggregate material in Southern Ontario and is used in:

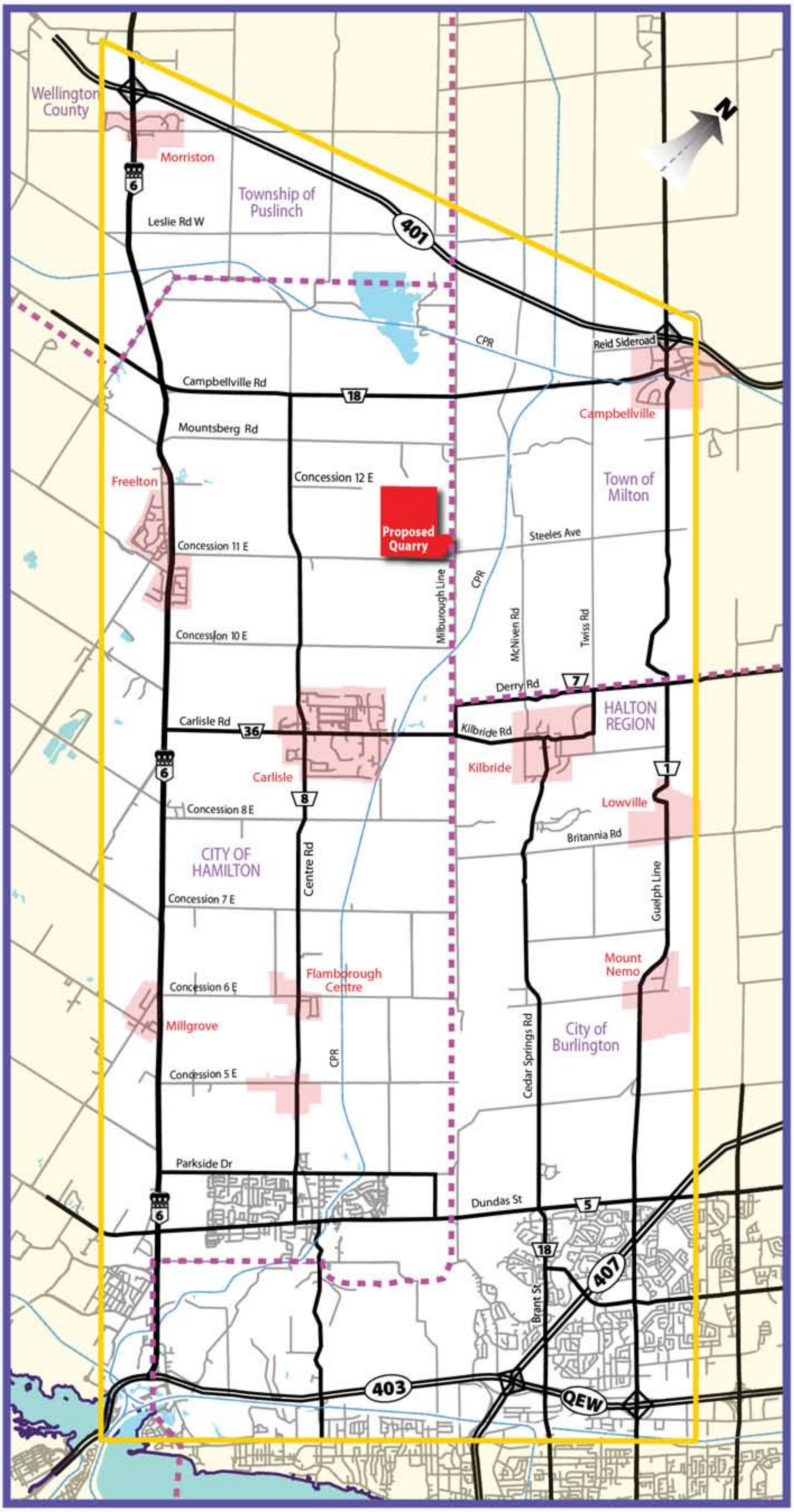
- Granular base in asphalt mixes and structural concrete for sidewalks, bridges, roads and streets
- Structural concrete for buildings bridges, sidewalks, and airport runways.



Not to scale

Area to be extracted

Study Area


Wellington County
Morriston
6
Township of Puslinch
Leslie Rd W
401
N
CPR
Reid Sideroad
Campbellville Rd
18
Campbellville
Mountsberg Rd
Freelton
Concession 12 E
Town of Milton
Proposed Quarry
Steeles Ave
Concession 11 E
Milburough Line
CPR
McNiven Rd
Twiss Rd
Concession 10 E
Derry Rd
7
HALTON REGION
Carlisle Rd
36
Kilbride Rd
Kilbride
Carlisle
8
1
Lowville
Concession 8 E
Britannia Rd
CITY OF HAMILTON
Centre Rd
Guelph Line
Concession 7 E
Mount Nemo
Flamborough Centre
Concession 6 E
Millgrove
Cedar Springs Rd
City of Burlington
CPR
Concession 5 E
Parkside Dr
Dundas St
5
18
Brant St
407
403
QEW

Terms of Reference

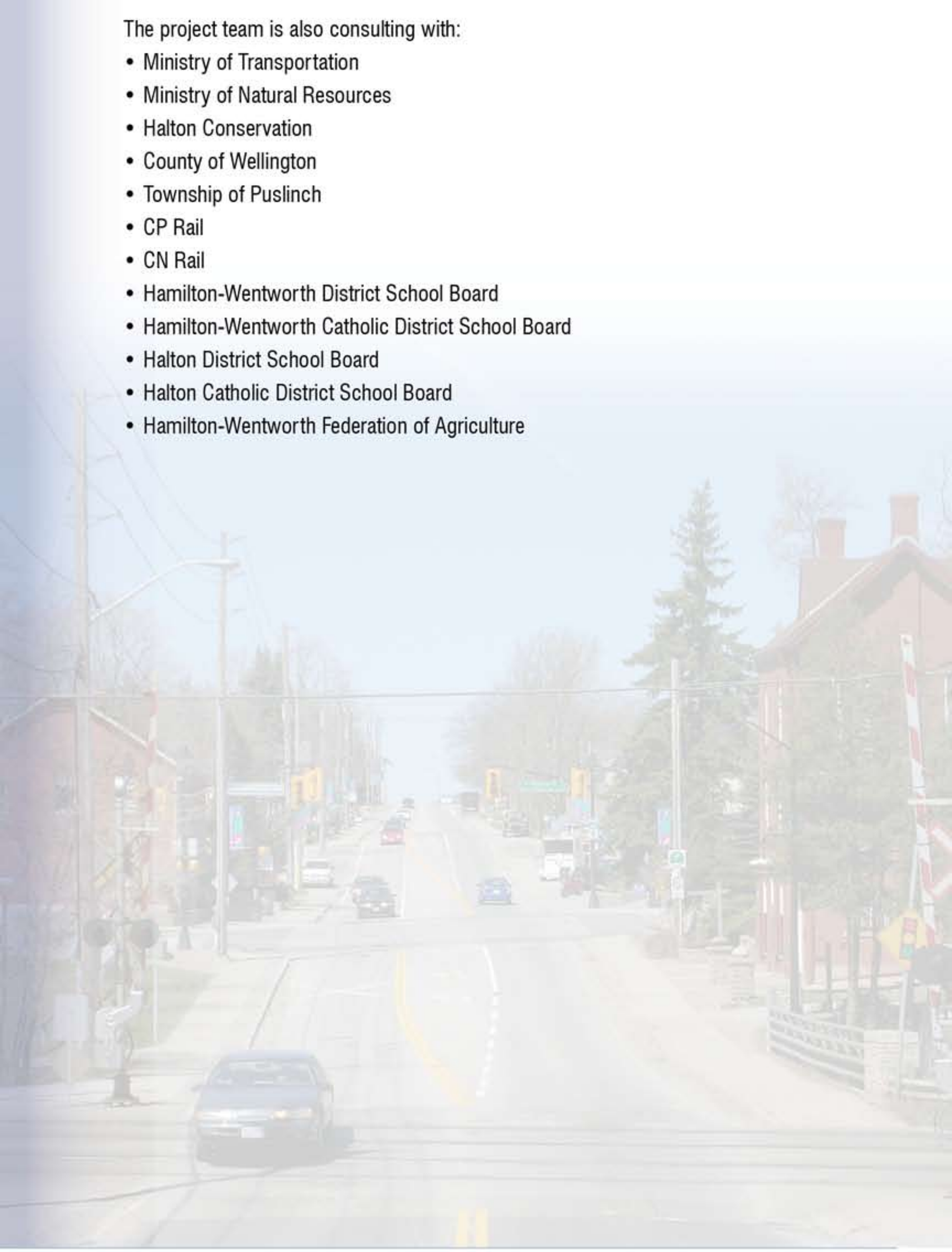
Applications for planning approvals were submitted to the City of Hamilton in 2004. The City has requested an evaluation be undertaken to select the preferred mode/ routes to transport the aggregate material from the proposed quarry site.

The Terms of Reference for the study were established by the Combined Aggregate Review Team (CART) consisting of:

- City of Hamilton
- Halton Region
- Town of Milton
- City of Burlington
- Niagara Escarpment Commission

The project team is also consulting with:

- Ministry of Transportation
- Ministry of Natural Resources
- Halton Conservation
- County of Wellington
- Township of Puslinch
- CP Rail
- CN Rail
- Hamilton-Wentworth District School Board
- Hamilton-Wentworth Catholic District School Board
- Halton District School Board
- Halton Catholic District School Board
- Hamilton-Wentworth Federation of Agriculture

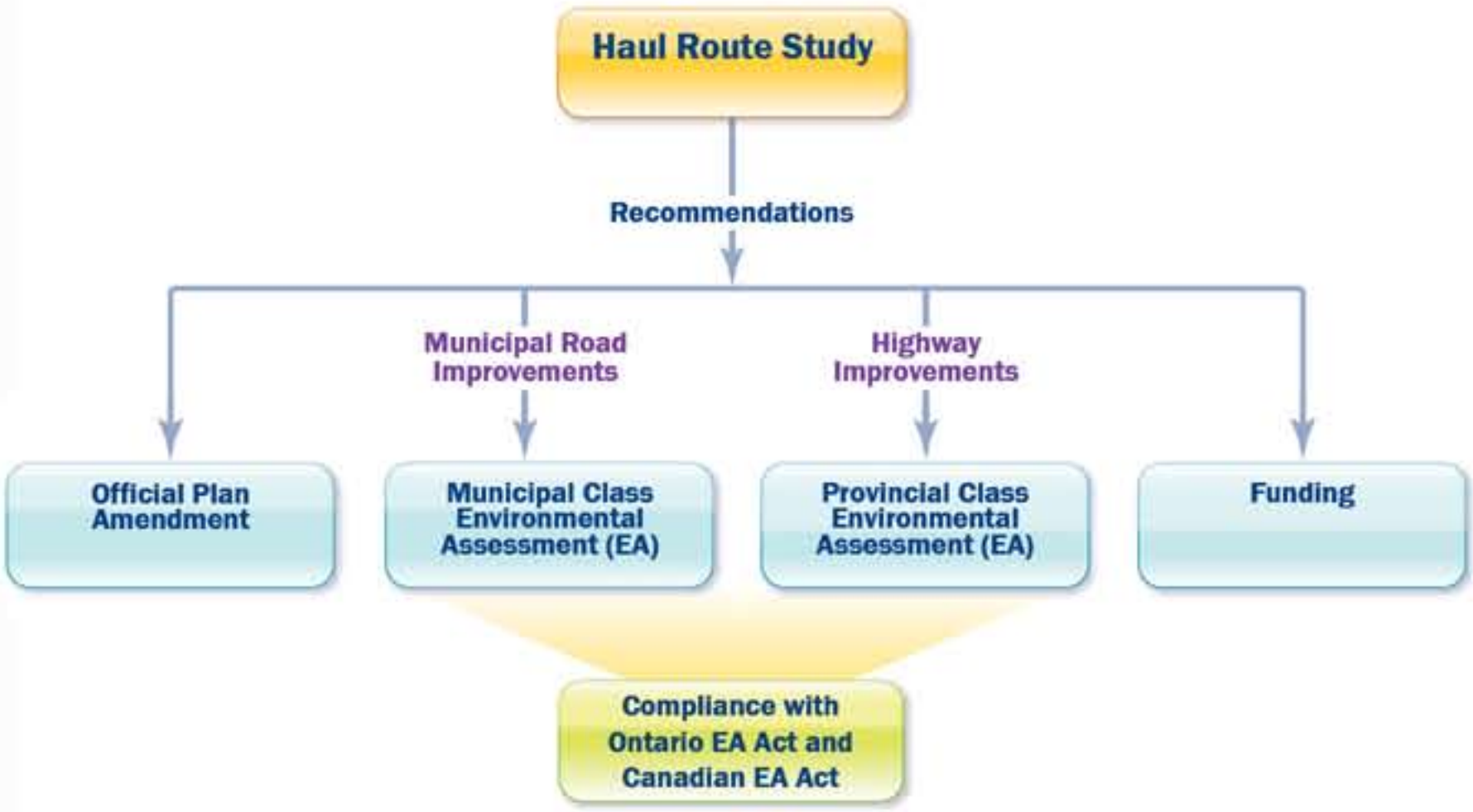


Haul Route Study Process

Although the Truck Route Study is not an environmental assessment, the Terms of Reference require that the evaluation be completed in a manner consistent with requirements of the Environment Assessment Act.

The primary activities to be carried out in the study as defined in the Terms of Reference are as follows:

Implementation of Haul Route Study Recommendations



As outlined in the Terms of Reference, the municipalities of Hamilton, Halton, Burlington and Milton are requesting that the evaluation be completed and consistent with the requirements of the Ontario Environmental Assessment Act and its regulations (if applicable). Should there be a need to improve roadways to support the project (if the application receives Planning Act and Aggregate Resource Act approvals), a Class EA for these improvements will likely need to be undertaken (the MEA Municipal Class EA and/or the MTO Class EA for Provincial Highways). This haul route evaluation would serve to support the preferred alternative as part of possible future EAs to fulfill Ontario EA Act requirements and possibly the Canadian Environmental Assessment Act.

Public Events

The study process for the Haul Route Study is based on the Terms of Reference approved by the Combined Aggregate Review Team (CART). The following is a summary of the four public consultation events based on the Terms of Reference:

Public Event #1 (Public Information Centre)

- Introduce the Haul Route Study
- Present a preliminary statement of the problem and issues to be addressed
- Present an overview of some data and information collected so far
- Present a preliminary assessment of alternative transport modes

Held on June 21, 2007

Public Event #2 (Public Information Centre)

- Present preliminary alternative routes
- Present the evaluation approach

Held on November 29, 2007

Public Event #3 (Public Workshop)

- Public input on the evaluation criteria
- Public input on the relative importance of the criteria
- Public input

Held on January 9, 2008

Public Event #4 (Public Information Centre)

- Share interim analysis of the haul routes
- Share interim evaluation results
- Obtain public feedback

"NEW" Tonight

Public Event #5 (Public Information Centre)

- Present the preliminary results of the evaluation of the alternative routes
- Present the preliminary recommendations on the preferred haul routes
- Present recommended improvements and mitigation measures
- Obtain public input

Fall 2008

What Did We Hear PIC#2?

	Comments	Action by SMC:
	Baseline Information:	
1.	Outdated traffic statistics	Additional traffic counts have since been collected.
2.	Missing information on the number of school buses	This data has been collected and incorporated into our analysis
	Alternatives:	
3.	Alternative 3 seems most logical-keeps trucks off Hwy 6 and provides shortest distance to 401.	This comment is considered in the evaluation.
4.	Given 75% of trucks will be heading towards the GTA Alternative 3 is the best option because it will reduce travel time and avoid the current bottle neck in Morriston.	This comment is considered in the evaluation.
5.	Alternative 1 is the only route that makes sense, all others involve the 401 emergency route.	This comment is considered in the evaluation.
6.	Alternative 1 is the best choice but need to compensate residences for loss in property value and need to upgrade Hwy 6.	This comment is considered in the evaluation.
7.	Alternative 5 is too dangerous	All of the alternatives were assessed for traffic safety
8.	Consider new 401 interchange at Milburough	This alternative was reconsidered. It was not carried forward due to its potential area-wide traffic impacts as well as impacts on conservation lands.
9.	Alternative 1 and 2 are unacceptable and go through the village of Morriston	We recognize the potential impacts of Alternatives 1 and 2 on Morriston; these impacts are incorporated into the analysis.
10.	Alternative 3 has 2 sets of railroad tracks	For the railway crossings, mitigating measures for Alternatives 3, 4, and 5 include the installation of gates at the Campbellville crossing and the installation of traffic signals at Campbellville and Twiss that are coordinated with the rail crossing on Twiss. Also the construction of an exclusive left-turn lane for storing vehicles turning left and heading north on Twiss.
11.	Corner at Conc 11 and Centre has poor visibility	Improvements to this intersection are part of Alternatives 1, 2, 4, and 5.
12.	Traffic lights at Hwy 6 for Alternative 1 will benefit residents west of Hwy 6 trying to turn north	New traffic signals are recommended at the intersection of Concession 11 and Highway 6, for Alternative 1.
13.	All routes would impact residential, recreational, farms, natural areas, and wetlands and should not be used for truck routes.	All of these sensitive land uses were carefully considered in the evaluation including the identification of treatments designed to minimize the impacts.
14.	All routes will change the daily use of the roads and will have significant impact on the quality of life for the residents of this community.	The impacts of the alternative routes on local residents have been incorporated in the analysis.
	Impacts of Truck Traffic:	
15.	Trucks take any route they want	To control haul routes, St. Marys has had success with their strict trucking policy at their other locations. Similar controls on truck routes would be implemented here.
16.	Policing by public won't work, too hard to read license plates	For enforcement of haul routes, St. Marys will coordinate efforts with local police and will conduct its own enforcement.
17.	Trucker's receive bonuses so will always try for 1 extra run, speeding will be an issue.	This comment is considered in the evaluation.
18.	St.Marys only interested in money and not concerned about our homes	The potential impact on homes and residents is an important consideration, and is included in the analysis of alternative haul routes. In addition, the study includes recommendations on measures to mitigate potential impacts on local residents.
19.	Don't change our picturesque roads	We recognize the picturesque nature of existing roads in the area, and this is considered in the analysis of the alternative haul routes.
20.	Hamilton taxes are already high and don't think they should increase to pay for road improvements	St.Marys will enter into a development agreement and be responsible for development costs associated with the accommodation of quarry trucks.
21.	School bus traffic on Campbellville is a concern	The issue of school buses is included in the analysis of the alternative haul routes.
22.	Bad T-junction at Mountsberg and Milburough, concern for conflicts between school buses and trucks	If sight line distances are deemed insufficient the roads will be upgraded.
23.	Area is in the Green Belt	Conformity with the provincial Greenbelt Plan was evaluated for each alternative.
24.	Don't use Milburough Line if it needs straightening or widening (Pollution and road widening will negatively impact the forest; deforestation is a major contributor to global warming)	The alternative haul routes involving Milburough Line include recommendations to improve the existing design. Impacts on adjacent forests and natural areas are considered in the analysis.
25.	Guelph Line/401 interchange improvements are not being upgraded to a standard necessary for the proposed truck traffic.	The impact of proposed quarry traffic on the interchange is included in the analysis of the alternative haul routes.
26.	Traffic congestion is very important	This has been reflected in the evaluation.
27.	Campbellville is already losing business with excessive traffic	All of the alternative haul routes avoid the commercial core of the Campbellville Community.
28.	Campbellville/1st Line has very poor sight lines	Where intersection sight line distances are deemed insufficient it is recommended that mitigating measures such as improving the vertical profile or installing traffic signals be implemented.
29.	Bus routes, cyclists, and peoples enjoyment of roads must have a very high priority	This has been reflected in the evaluation.
30.	Way of life is very important	This has been reflected in the evaluation.
	Public Consultation Process:	
31.	Location of PIC #2 was good but the venue was too small and did not have enough seating.	The venue location has been changed to the Carlisle Arena for PIC#4.
32.	Format was good ▪ excellent questions and comments ▪ typist did not capture emotions of the public ▪ answers were insufficient ▪ longer Q&A period	We acknowledge these comments.
33.	Why are we discussing haul routes when we are more concerned with the impact on our water?	St. Marys is addressing water issues in a separate study. Tonight's focus is on haul routes.
34. •	Internet site needs improvement	The site has been updated and can be viewed at www.flamboroughquarry.ca

What Did We Hear at PIC #2? (Continued)

The following is a summary of the relative importance of the evaluation criteria based on the responses we received at PIC #2.

		Number of responses		
		Very Important	Somewhat important	Not important
Aquatic Environmental/ Surface Water	Potential for disturbance to aquatic habitat	33	2	1
	Potential for removal of aquatic habitat from road improvements (e.g. culvert extensions)	33	4	0
Terrestrial Environment	Potential for disturbance to natural habitat	32	3	0
	Potential for removal of natural habitat from road improvements	34	2	0
	Potential for increased wildlife kills	30	4	1
Land Uses	Potential for disruption effects to sensitive planned land uses	31	3	0
	Potential for removal of planned land uses from road improvements	28	5	0
	Conformity with applicable plans and policies	28	7	0
Social Environment and Community Impacts	Potential for disruption to residents	34	1	0
	Human health	34	1	0
	Potential for disruption to users of recreation facilities, community features and institutions	30	5	0
	Potential for displacement/removal of residents & residential property from road improvements	30	5	0
	Potential for removal of recreation, community features & institutions	31	3	0
Economic Environment and Business Impacts	Potential for disruption to business enterprises	26	9	1
	Potential for removal of business enterprises and/or property	27	8	1
	Potential for affect on property values	31	4	0
	Potential for effect on agricultural operations	28	9	0
Cultural and Heritage Resources	Potential for disturbance to built heritage	21	6	0
	Potential for effects on archaeological resources	24	9	2
Transportation	Change in road service	30	4	1
	Potential for change in road safety level	34	0	0
	Potential for impact on alternative transportation modes	30	2	1
Cost	Estimated infrastructure costs	27	3	0

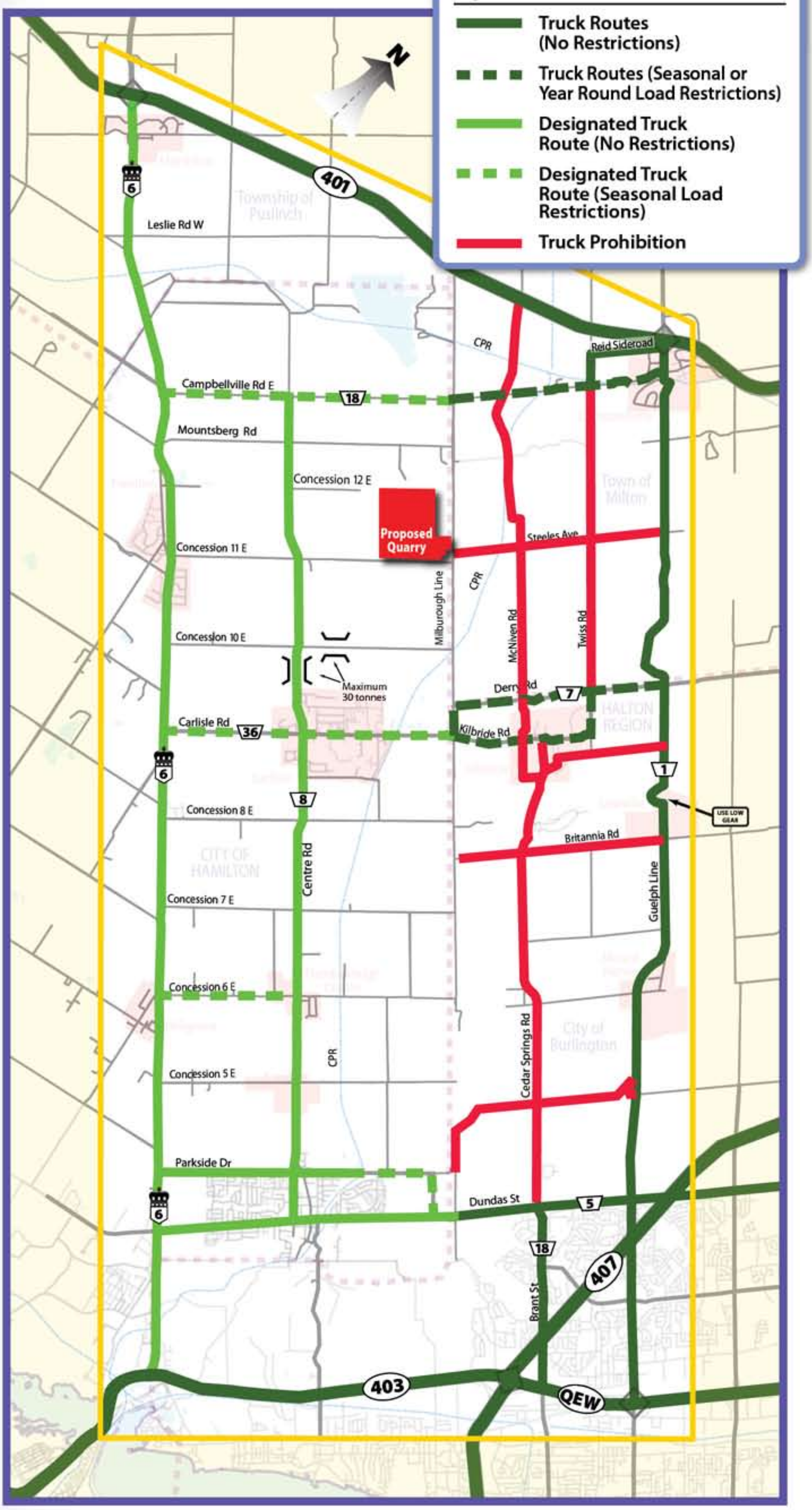
What Did We Hear at the Workshop (PIC#3)?

	Comments	Action by SMC:
	General Comments:	
1.	Concern this project will be a trigger point for more development in the area; community will lose the small town feel/quaintness	Development in the area will be controlled through the new Hamilton Rural Official Plan, the Region of Halton Official Plan, and the Town of Milton Official Plan which restrict new uses to those rural uses which are in character with and compatible with the rural nature of the area. It is not expected that the quarry will precipitate any new development in the area. Any new development would also be required to be in conformity with the Growth Plan and the Greenbelt Plan, neither of which anticipate or permit new urban type development in the area in proximity to the proposed quarry
2.	Fear future residential and industrial development and satellite industries	This comment is considered in the evaluation.
3.	Trucks drive quickly because they are paid by the load-Is this how St. Marys will pay the drivers?	St. Marys are committed to safety and expect the haulers they use to operate in a safe manner, this includes obeying speed limits.
4.	Government needs aggregate supply so they don't have our best interests in mind; how are we going to get government support?	The haul route study is being carried out under the Terms of Reference approved by CART (April 2006).
5.	Need to find a rare salamander or a Native burial ground to stop this project	Potential impacts on the natural environment, built heritage, and archaeological resources were analyzed and given consideration in the evaluation
6.	Water issues are more important	Impact on water is being carried out in a separate study by St. Marys.
7.	No tabulated results of survey from last meeting – all my answers were in there.	The tabulated results from previous PICs are presented at this public information centre.
	Alternatives:	
8.	Support Alternate Haul Route 1 - Best route as it minimizes exposure to cyclists on Milburough Line, Centre Road and Campbellville Road	This comment is considered in the evaluation.
9.	Alternative 1 is the most direct, least disruptive route, but how do you expect to enforce truck prohibitions.	St. Marys expects their truckers to operate according to local by-laws and avoid routes that have truck prohibitions. If they aren't adhering to these prohibitions St. Marys will deal with them on a case by case basis and can refuse to use companies that don't abide by local restrictions.
10.	Alternative 2 is not a viable set up – hills, line of sight –trucks prefer not to make turns every mile and a half.	This comment is considered in the evaluation.
11.	Alternative 3 is not good – Campbellville can never take the traffic that would be on Twiss and Reid Roads – Townline needs total rebuild – wet lands and low lands – potential problems at Campbellville and Townline Road.	This comment is considered in the evaluation.
12.	Alternative 5 is the worst option presented.	This comment is considered in the evaluation.
	Impacts of Truck Traffic:	
13.	Vehicle damage: chips out of windshields and flat tires on school buses	This potential impact is included in the analysis of the alternative haul routes.
14.	Volume of truck traffic	The increase in truck traffic is included in the analysis of the alternative haul routes.
15.	Increased traffic always has an effect on local business and activities	The potential impact on local businesses is included in the analysis of the alternative haul routes.
16.	Quarry hours of operation 7am-7pm affects rush hour and kids headed to school	This is considered in the analysis of the alternative haul routes.
17.	Property impacts: cracks in house foundations, vibration and dust, waste, home equity and property value	An assessment of vibration and dust impacts was completed in addition to a qualitative assessment of changes in property value.
18.	Winter driving conditions	The recommended road improvements consider the safety of the roads during winter driving conditions.
19.	Road condition: already torn up by school buses	The recommended road improvements will bring the roads up to current design standards.
20.	Road access	This was analyzed and given consideration in the evaluation
21.	Trucks won't stick to the designated haul routes– suggest brightly numbering trucks	St. Marys trucking policy has been implemented successfully at their other locations. For enforcement of quarry truck haul routes, St. Marys will coordinate efforts with local police and will conduct its own enforcement.
22.	Congestion on the 401: 401 is not productive to trucking	401 is one of the primary provincial east-west truck routes.
23.	Why not use rail line or a tunnel under Campellville or Milburough?	Construction of a rail spur connection has been evaluated. Due to its impacts on the natural environment, this option was not carried forward.
24.	Site is in close proximity to 401, why not use trucking stations and convoys?	Alternative strategies involving transfer stations and rail were considered, and presented in PIC #2.
25.	MTO needs to study this and provide data.	We have been in contact with MTO and they have provided feedback that we have incorporated into our study.
26.	St. Marys needs to identify the necessary upgrades for load restrictions	All roads along the preferred haul route will be upgraded to eliminate the need for load restrictions
27.	What about rehabilitation of the quarry site?	St. Marys has won awards for their successful rehabilitation projects and would treat this site with the same high standards.
28.	How long will the quarry be in operation?	At this time it is anticipated that the quarry will be in operation from 2011 to 2031, but these times may change based on extenuating circumstances.
29.	School buses and new developments are driving us crazy	Future traffic increases and school bus traffic are considered in the analysis.
30.	LaFarge has conveyor belt from north of #5 to south – subterranean	We are aware of this.
31.	Certain cultural and heritage features are NOT negotiable	Our analysis has revealed that there would be no removal of cultural or heritage features.
	Public Consultation Process:	
32.	Need a venue with a larger capacity, suggested the Our Lady of Mount Carmel Elementary School	The venue location has been changed to the Carlisle Arena for PIC#4.

Existing Road and Rail Network

*Contents on this board reflect the most recent information available and the following sources: discussions with municipal staff and site visit

Designated Truck Routes and Load Restrictions



*Contents on this board reflect the most recent information available and the following sources: Discussions with municipal staff, Burlington: Rural Truck Routes

Typical Quarry Hours and Truck Information

The following provides details about the expected quarry hours and the anticipated truck fleet.

When will the quarry begin operation?	**The expected start of operation of the proposed quarry is subject to approval timing**
What will be the maximum tonnage of aggregate materials?	**3 million tonnes per year maximum. Typical tonnage could be much lower.**
Proposed days and hours of operation for the quarry?	**Monday to Friday 12 hours Saturday 6 hours**
Number of truck loads per day?	**1140 truck trips average maximum/day 570 trucks inbound and 570 trucks outbound. Typical number of trucks could be much lower. In addition, other traffic will include service vehicles and employee traffic.**
Truck Sizes and Truck Mix	**42 tonne – 15% 35 tonne – 60% 25 tonne – 25%**
Number of Employees	**30 - 35 per shift**

Semi and Pup (42 tonne)

Tractor Trailer (35 tonne)

Tri-axle (25 tonne)

Tools to Control Truck Traffic

One of the issues that has been raised is ensuring that truckers adhere to the designated haul routes. At other locations St. Marys has found that the following process that is centred on the "Truck Safety policy" has been effective.

Truck Safety Policy (some excerpts from the trucking policy are as follows)

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.
- Independent truck drivers hauling material off CBM property shall follow prescribed rules on and around CBM's operations.
- This policy is not limited specifically to CBM's sites, but also extends to the arterial routes that surround all of CBM's operations.
- 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.
- When specified for a particular site, trucks are expected to follow designated haul routes.

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 a 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.

Contact Record Form

- documents date of complaint, person complaining, explanation of their concern, action taken to correct concern
- results of the corrective action and follow up

Limehouse Pit Case Study

It is our recommendation that a designated haul route is the best approach combined with St. Marys truck route policy that has been applied successfully at other locations such as the Limehouse Pit in Georgetown.

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 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.

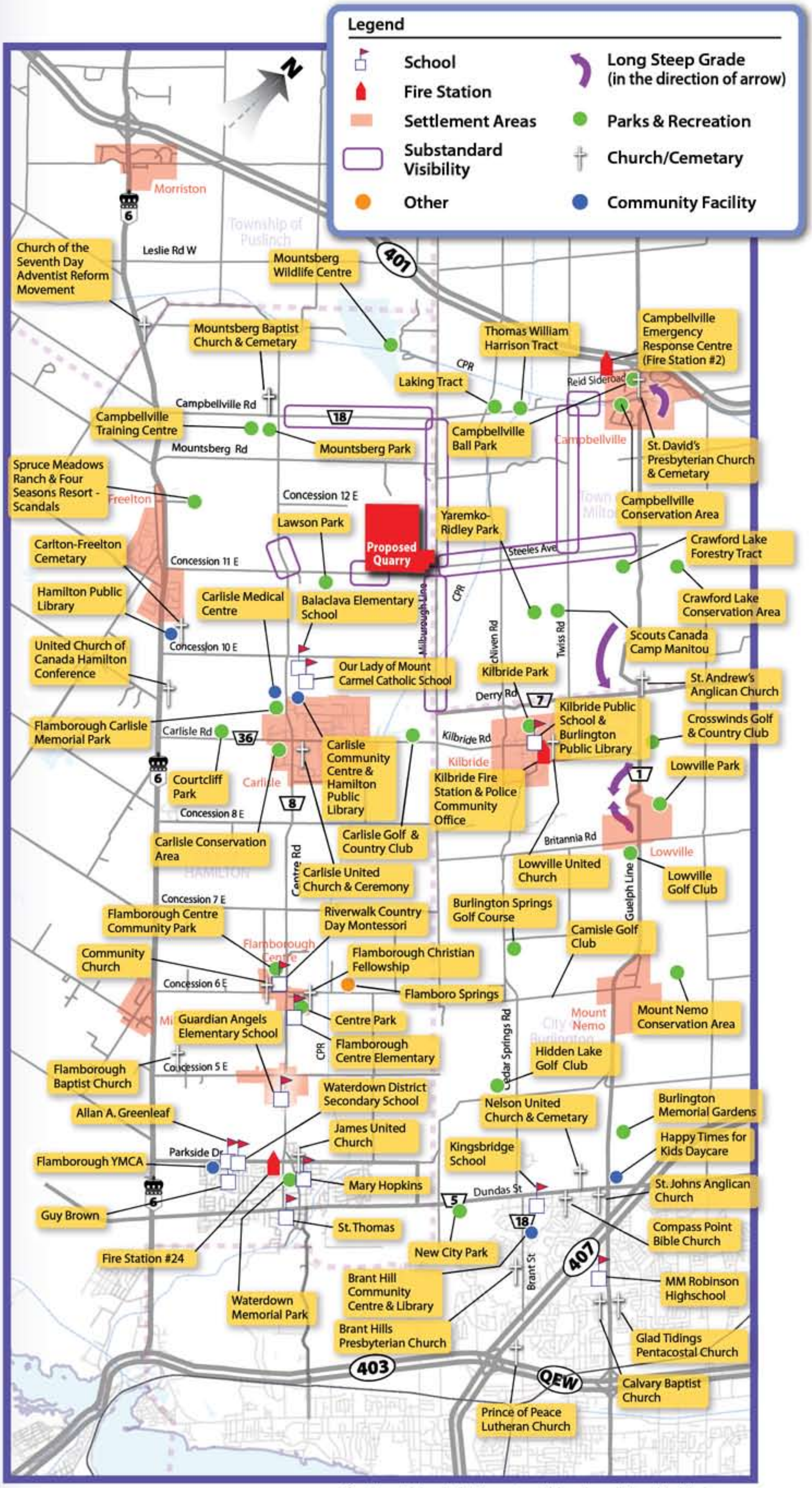
St. Marys encourages local residents to call them directly with concerns about the trucks and whenever possible provide them with the license plate numbers so that they can take the appropriate action. This has been effective in the past to keep trucks on the designated haul routes.

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 route.

The next display boards illustrate the alternative designated haul routes that have been identified to date. Your comments and suggestions on these alternatives are welcomed.

Preliminary Constraints Map



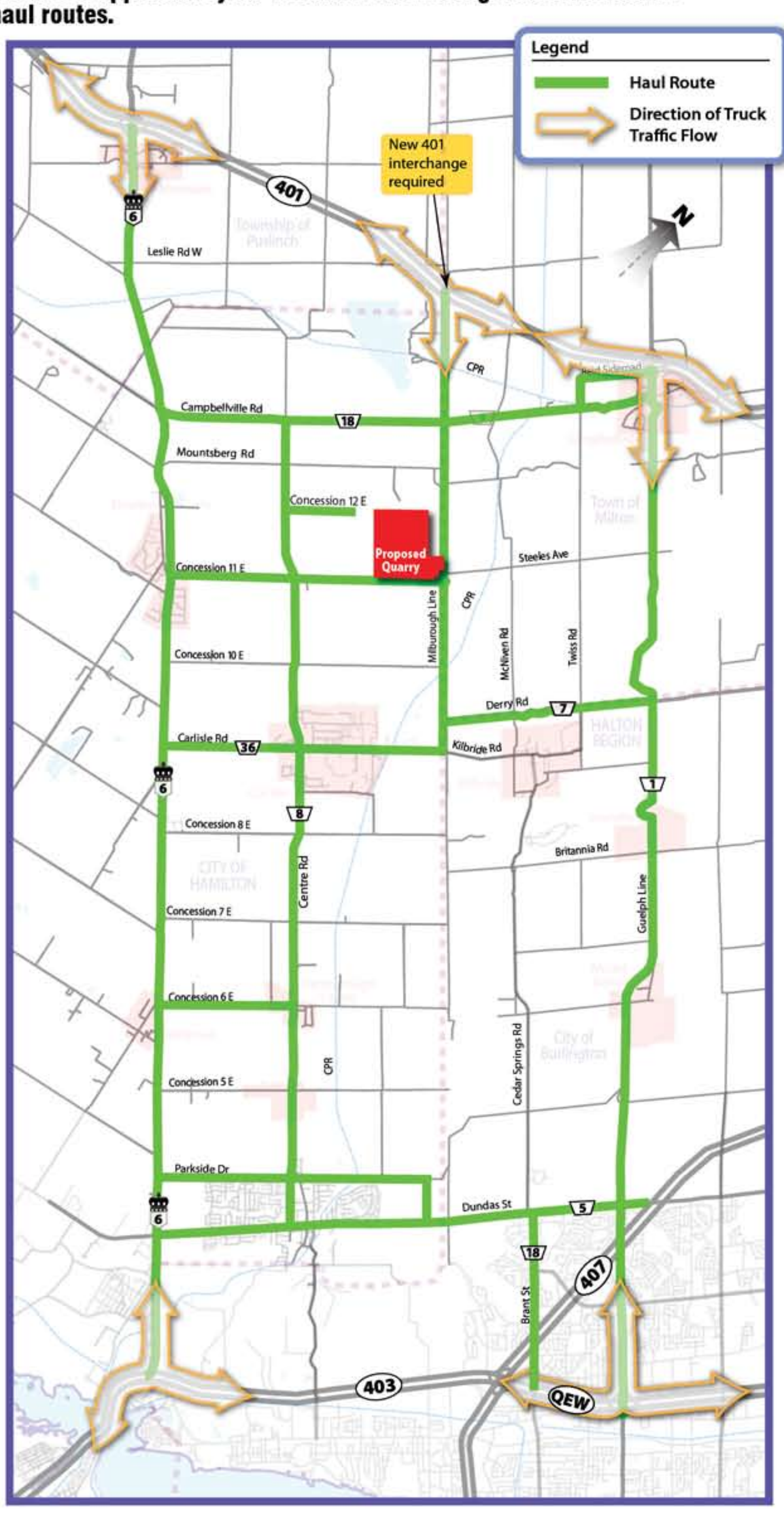
*Contents on this board reflect the most recent information available and the following sources: Hamilton Official Plan, Halton Official Plan, Map Art, Site Visit

Initial Long List of Alternative Haul Routes

To identify our initial list of alternative haul routes we used the following criteria as guidelines:

- Existing truck routes
- Existing arterial roads
- Existing provincial highways
- Existing roads that border the site: Concession 11 E, Concession 12 E, Milburough Line

We would appreciate your feedback on the long list of alternative haul routes.



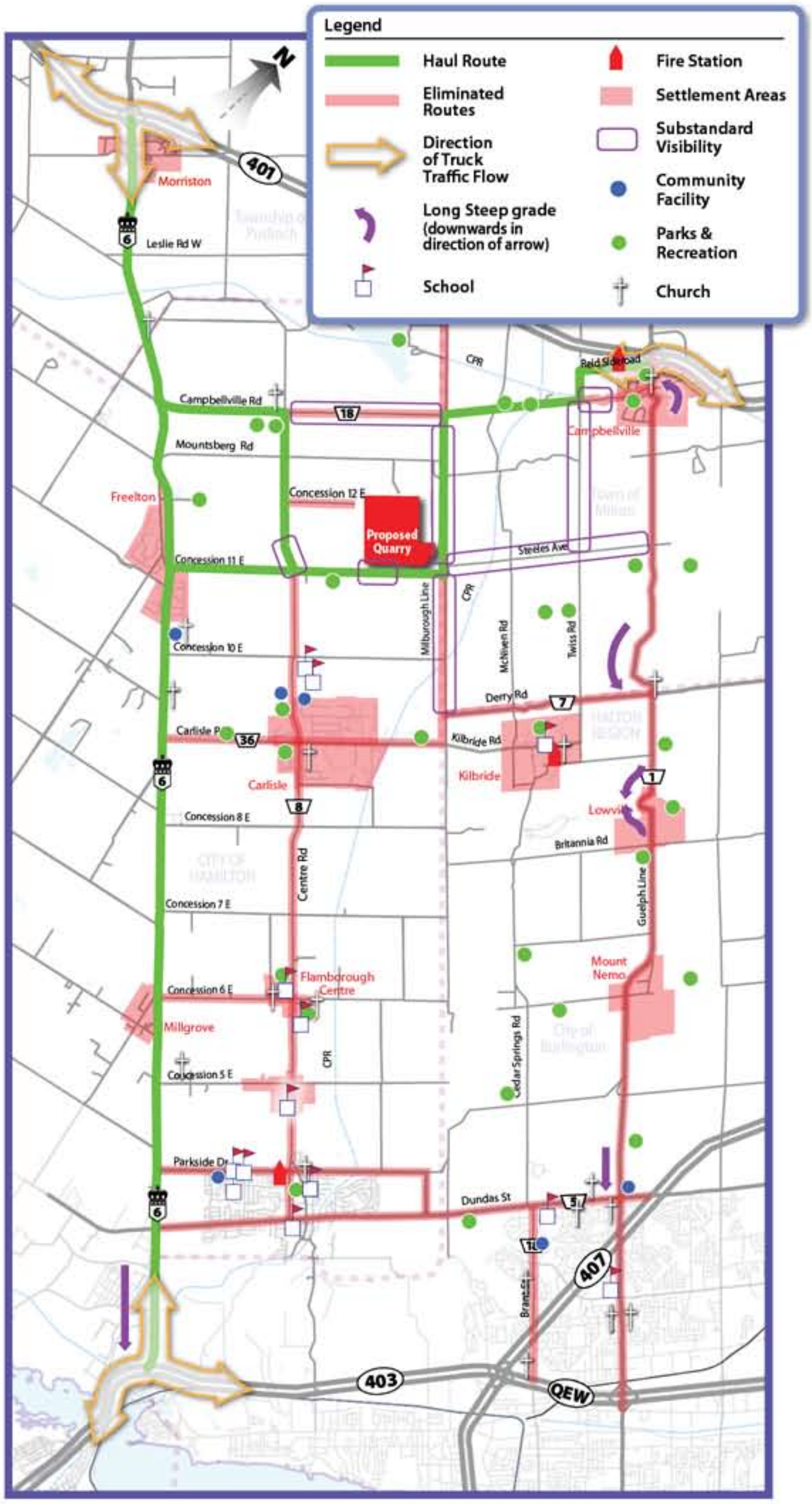
Short List of Alternative Haul Routes

We reviewed the long list of alternative haul routes and screened them to eliminate routes with significant disadvantages or impacts.
Screening criteria for screening the long list of alternative haul routes to achieve a short list of alternative haul routes were:

- Avoid settlements/built-up areas
- Avoid schools and parks
- Avoid roads with significant engineering and safety deficiencies
- Avoid significant impacts on the natural environmental
- Avoid extensions or new road construction to minimize environmental impacts

We would appreciate your feedback on the short list of alternative haul routes.

Note: The location of the site driveway has not been finalized and is subject to phasing and the results from hydrogeology.



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Hamilton Official Plan, Halton Official Plan, Map Art, Site Visit

5 Alternative Haul Routes Have Been Identified

Based on the short list of alternative haul routes, we identified 5 alternative haul routes to provide access to Highway 401 east and west and to Highway 403 east and west. They are illustrated below:

Alternative Haul Route 1

Alternative Haul Route 2

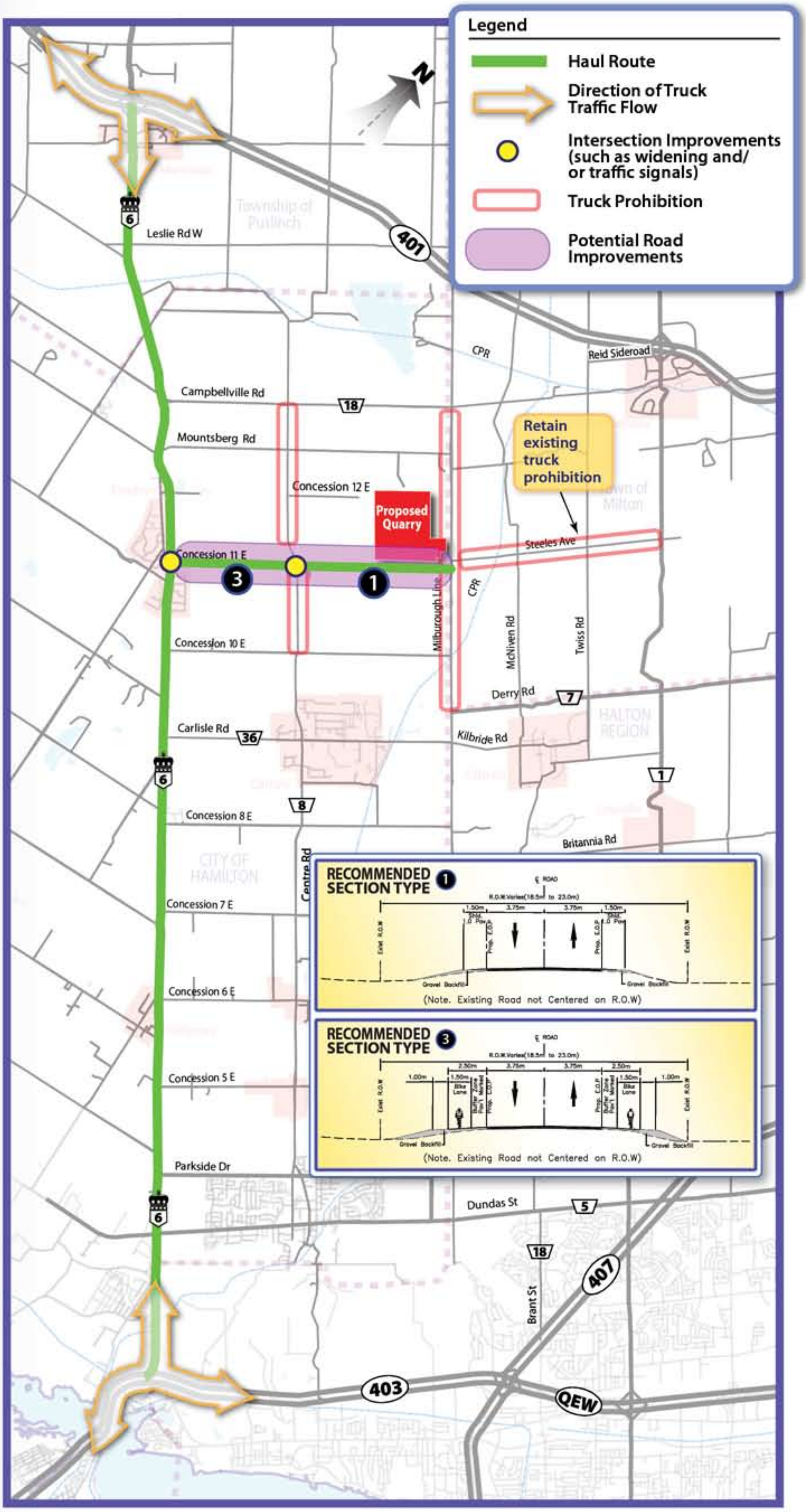
Alternative Haul Route 3

Combined Haul Routes

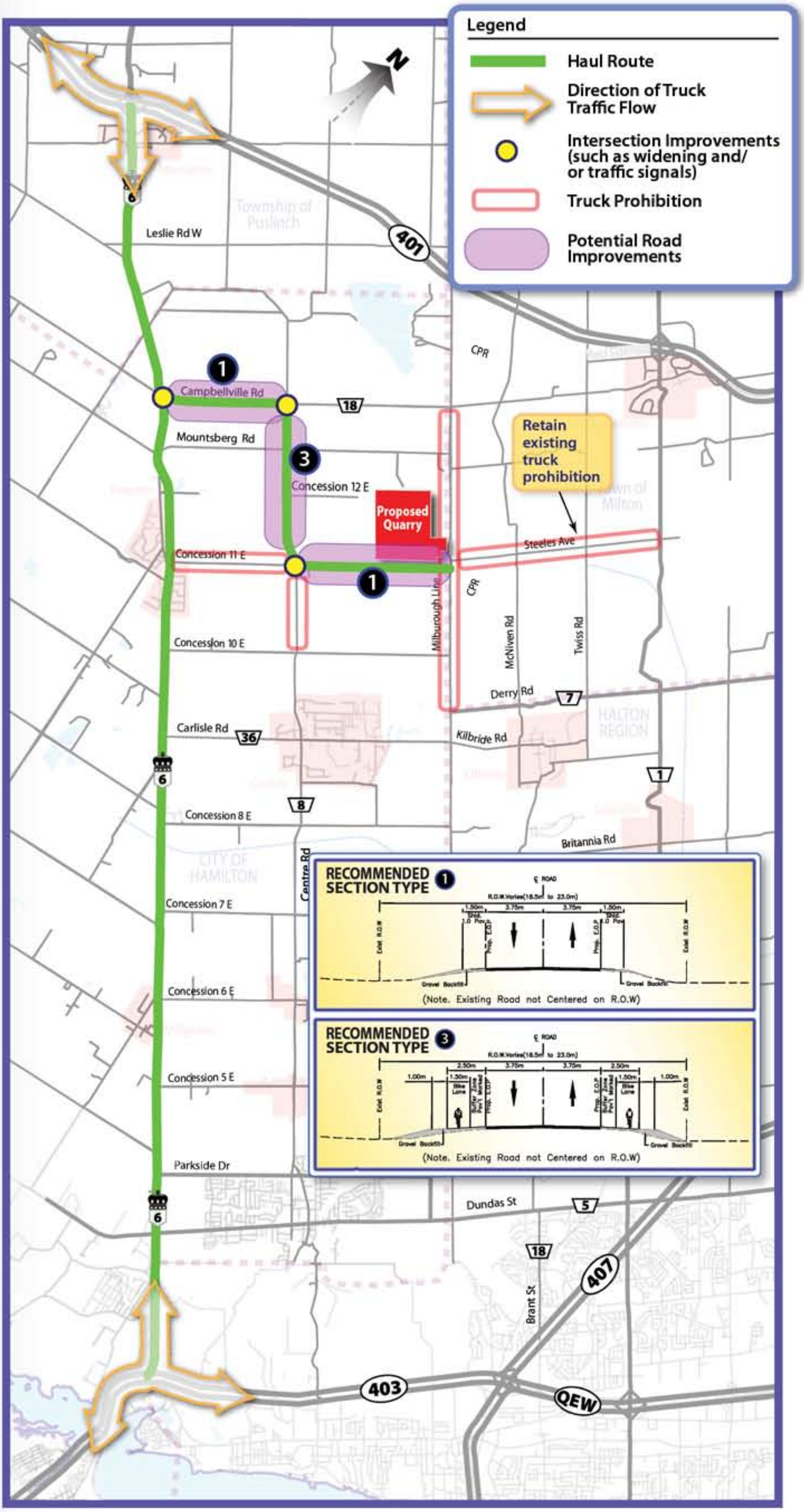
Alternative Haul Route 4

Alternative Haul Route 5

Alternative Haul Route 1

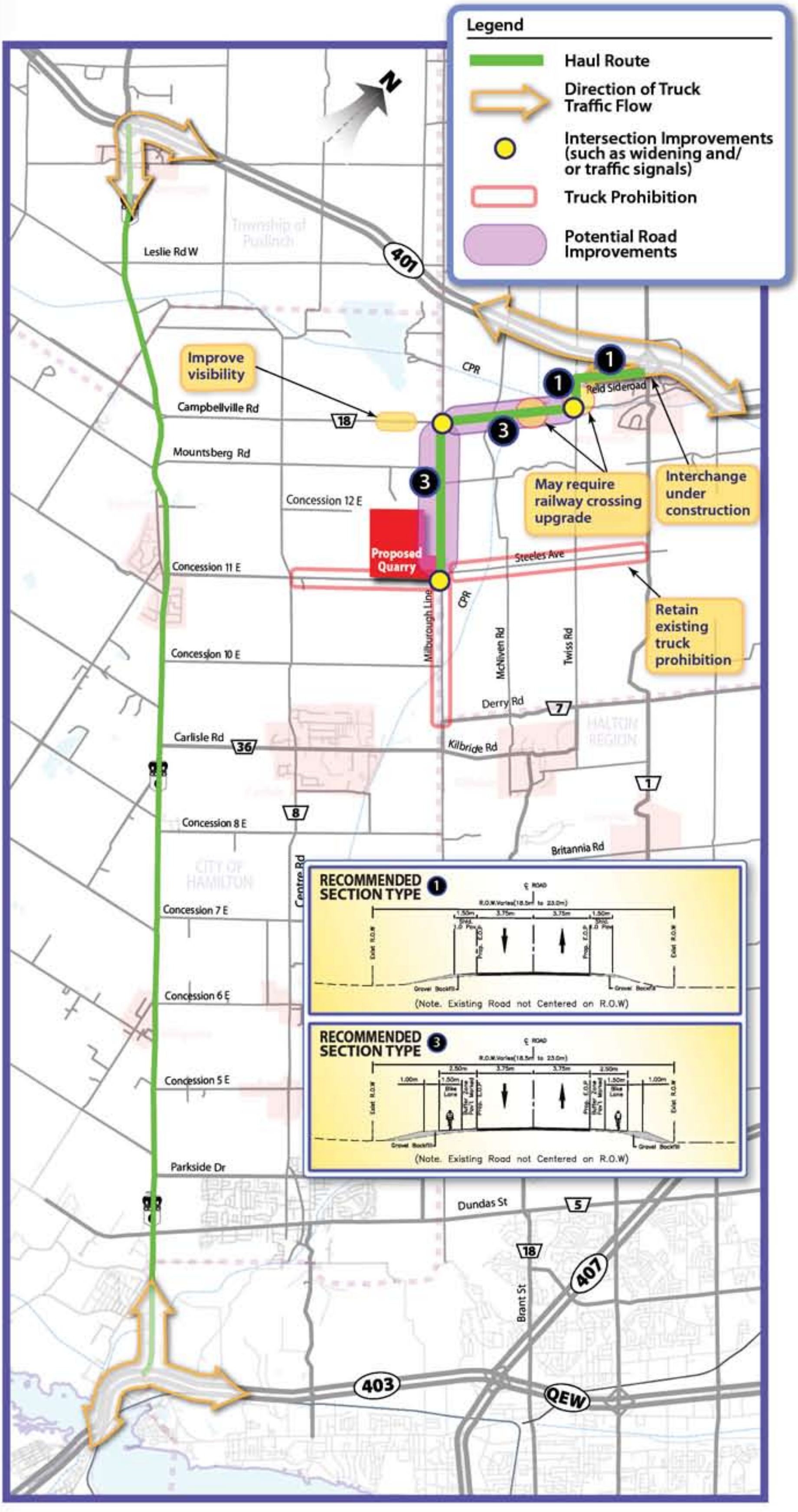


Alternative Haul Route 2

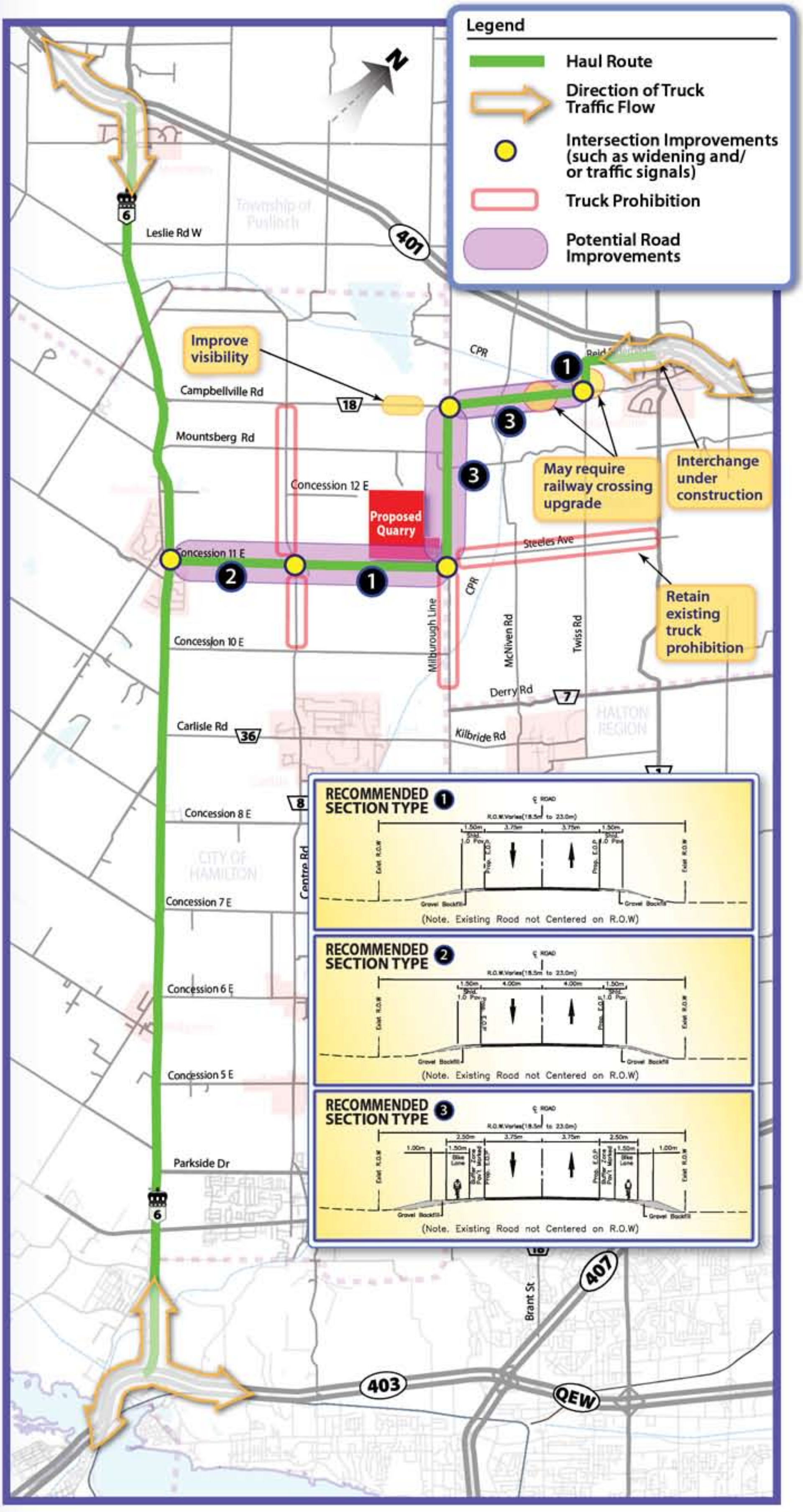


Alternate Haul Route 3

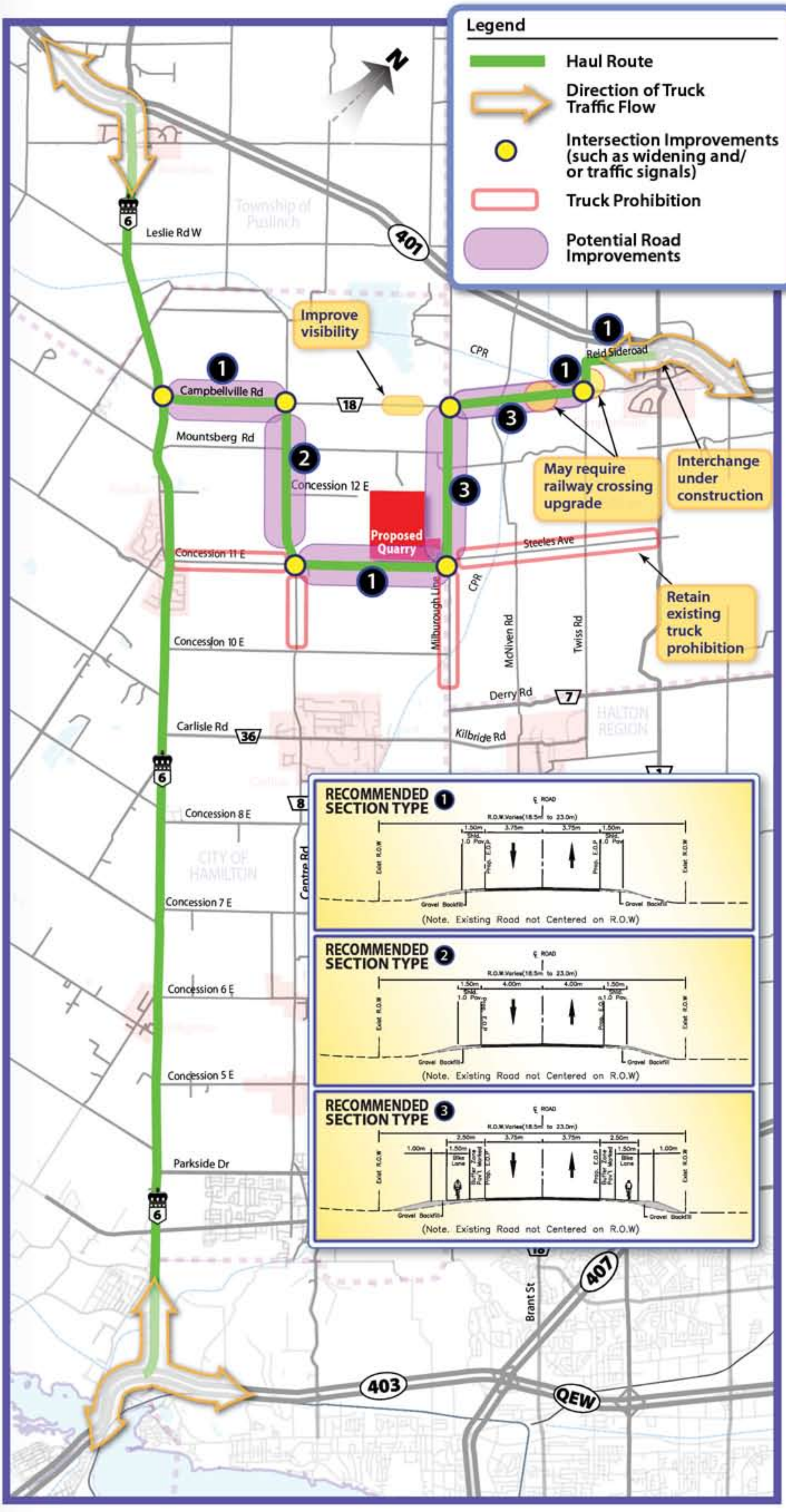
Note: Trucks are not prevented from travelling south via Hwy 6 - the impacts on Hwy 6 will be assessed as part of the evaluation of this alternative.



Alternative Haul Route 4



Alternate Haul Route 5



Detailed Analysis of the Alternative Haul Routes

We welcome your comments on the analysis.

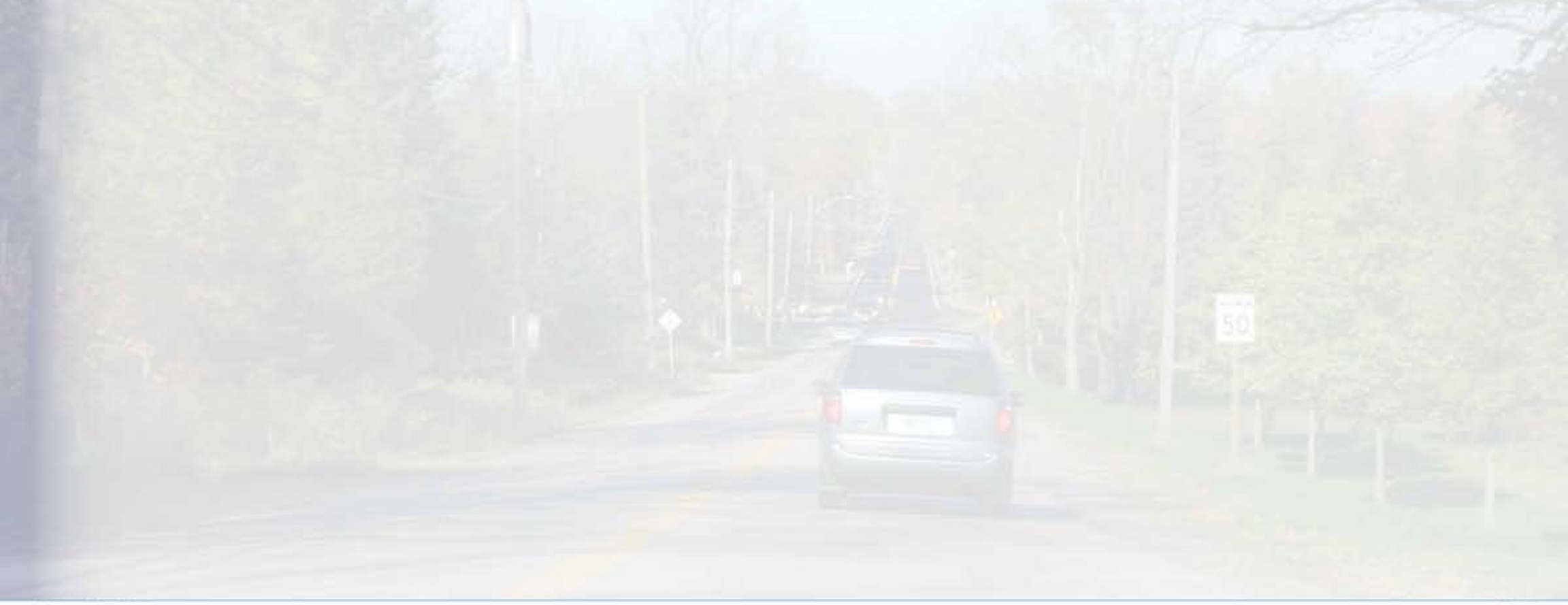
Aquatic Environment / Surface Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Savanta						
Potential for disturbance to aquatic habitat.	Number, character and sensitivity of watercourses crossed where road works are expected, exclusive of crossings of Highway 6). *Ephemeral – water flows for a short period of time in response to local precipitation events.* *Intermittent – water flows for several months of the year, usually in the wetter periods.*	MEDIUM 3 Permanent, 4 Intermittent 1 ephemeral = 8 crossings	HIGH 4 permanent 6 intermittent 2 ephemeral = 12 crossings	MEDIUM 2 permanent 4 intermittent = 6 crossings	HIGH 4 permanent 6 intermittent 3 ephemeral = 13 crossings	HIGH 5 permanent 8 intermittent 4 ephemeral = 17 crossings
	Likelihood of increased runoff effects on these watercourses. These effects can be managed largely through proven impact mitigation measures. **Riparian conditions of permanent water courses at proposed crossings**	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. In short-term, until vegetation becomes re-established, there will be a slight increase in runoff from adjacent banks disturbed during construction.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. In short-term, until vegetation becomes re-established, there will be a slight increase in runoff from adjacent banks disturbed during construction.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. In short-term, until vegetation becomes re-established, there will be a slight increase in runoff from adjacent banks disturbed during construction.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. In short-term, until vegetation becomes re-established, there will be a slight increase in runoff from adjacent banks disturbed during construction.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. In short-term, until vegetation becomes re-established, there will be a slight increase in runoff from adjacent banks disturbed during construction.
	Potential for increased erosion and sediment loading to receiving streams during construction. These effects can be largely mitigated through appropriate construction sedimentation mitigation measures.	LOW - MEDIUM Use of appropriate sediment and erosion control measures, work within appropriate construction timing guidelines and isolation of work area will be required.	LOW - MEDIUM Use of appropriate sediment and erosion control measures, work within appropriate construction timing guidelines and isolation of work area will be required.	LOW - MEDIUM Use of appropriate sediment and erosion control measures, work within appropriate construction timing guidelines and isolation of work area will be required.	LOW - MEDIUM Use of appropriate sediment and erosion control measures, work within appropriate construction timing guidelines and isolation of work area will be required.	LOW - MEDIUM Use of appropriate sediment and erosion control measures, work within appropriate construction timing guidelines and isolation of work area will be required.
	Likelihood of water quality impacts to watercourses from runoff as a result of road improvements.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. This may result in increased introduction of chlorides and/or sand, in addition to other pollutants such as grease/oil, etc.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. This may result in increased introduction of chlorides and/or sand, in addition to other pollutants such as grease/oil, etc.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. This may result in increased introduction of chlorides and/or sand, in addition to other pollutants such as grease/oil, etc.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. This may result in increased introduction of chlorides and/or sand, in addition to other pollutants such as grease/oil, etc.	LOW - MEDIUM Extension of existing crossings will result in slight increase in runoff from wider road/impervious surface. This may result in increased introduction of chlorides and/or sand, in addition to other pollutants such as grease/oil, etc.

We welcome your comments on the analysis.

Aquatic Environment / Surface Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Savanta						
Potential for removal of aquatic habitat from road improvements (e.g. bridge or culvert extensions or replacements).	Number of watercourse culverts/structures that could require extension to accommodate road improvements.	Potential for improvement in fish habitat/passage and/or groundwater upwellings by replacing corrugated plastic pipe (FCC11) (and possibly those associated with intermittent/ephemeral) with open foot structure. 3 permanent and 5 intermittent/ ephemeral watercourse crossings may require extensions.	Potential for improvement in fish habitat/passage and/or groundwater upwellings by replacing corrugated plastic pipe (FCC11) and CSP (BCEC), (and possibly those associated with intermittent/ephemeral) with open foot structure. 4 permanent and 8 intermittent/ephemeral watercourses may require extensions.	Potential for improvement in fish habitat/passage and/or groundwater upwellings by replacing CSP (KCCR), (and possibly those associated with intermittent/ephemeral) with open foot structure. 1 permanent and 4 intermittent/ephemeral watercourses may require extensions.	Potential for improvement in fish habitat/passage and/or groundwater upwellings by replacing corrugated plastic pipe (FCC11) and CSP (KCCR), (and possibly those associated with intermittent/ephemeral) with open foot structure. 4 permanent and 9 intermittent/ephemeral watercourses may require extensions.	Potential for improvement in fish habitat/passage and/or groundwater upwellings by replacing corrugated plastic pipe (FCC11) and CSP (BCEC and KCCR), (and possibly those associated with intermittent/ephemeral) with open foot structure. 5 permanent and 12 intermittent/ephemeral watercourses may require extensions.
Magnitude of removal effects.	MEDIUM	MEDIUM	MEDIUM	HIGH	HIGH
Sensitivity of habitat affected.	HIGH	HIGH	HIGH	HIGH	HIGH
Type of structure (bridge or culvert) being widened to accommodate road improvements	HIGH **Permanent watercourses** 5m wide open box culvert (Concession 11 Bronte Creek Tributary); 7.3 m wide open box culvert (Concession 11 Mountsberg Crk); 0.4 m corrugated plastic pipe (Concession 11 Flamboro Crk)	MEDIUM **Permanent watercourses** 6m open box culvert (west Campbellville Road Bronte Crk Tributary); 1m corrugated steel pipe (east Campbellville Road Bronte Crk Tributary); 7.3 m wide open box culvert (Concession 11 Mountsberg Crk); 0.4 m corrugated plastic pipe (Concession 11 Flamboro Crk). Refer to engineer for number of culverts/structures required	MEDIUM **Permanent watercourses** Three 1.8 m diameter corrugated steel pipes (Campbellville Road Killbride Crk). Refer to engineer for number of culverts/structures required	HIGH **Permanent watercourses** 5m wide open box culvert (Concession 11 Bronte Creek Tributary); 7.3 m wide open box culvert (Concession 11 Mountsberg Crk); 0.4 m corrugated plastic pipe (Concession 11 Flamboro Crk)Refer to engineer for number of culverts/structures required	MEDIUM **Permanent watercourses** 6m open box culvert (west Campbellville Road Bronte Crk Tributary); 1m corrugated steel pipe (east Campbellville Road Bronte Crek Tributary); 7.3 m wide open box culvert (Concession 11 Mountsberg Crk); 0.4 m corrugated plastic pipe (Concession 11 Flamboro Crk). Refer to engineer for number of culverts/structures required



Detailed Analysis of the Alternative Haul Routes

We welcome your comments on the analysis.

Terrestrial Environment Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Savanta						
Potential for disturbance to natural habitat.	Number and identification of sensitive features that the haul routes pass by. Distance of designated significant features traversed through (rural road segments where alterations/effects may occur)	4 Freelton Esker Wetland Complex FEWC Mountsberg East Wetlands MEW Carlisle North Forest CNF Lower Mountsberg Creek Wetland Complex LMCWC 2700 m	5 Freelton Esker Wetland Complex Mountsberg East Wetlands Carlisle North Forest Lower Mountsberg Creek Wetland Complex Puslinch Southeast Swamp PSS 2700m	4 Mountsberg East Wetlands Lower Mountsberg Creek Wetland Complex Carlisle North Forest Guelph Junction Woods GJW 2900m	5 Freelton Esker Wetland Complex Mountsberg East Wetlands Carlisle North Forest Lower Mountsberg Creek Wetland Complex Guelph Junction Woods 5600m	6 Freelton Esker Wetland Complex Mountsberg East Wetlands Carlisle North Forest Lower Mountsberg Creek Wetland Complex Puslinch Southeast Swamp Guelph Junction Woods 5600m
	Effects on vegetation from increased run-off from new road works, dust, emissions, etc.	HIGH	HIGH	HIGH	HIGH	HIGH
Potential for removal of natural habitat from road improvements.	Area (ha), character and sensitivity of vegetation to be removed due to required road improvements.	MEDIUM 1.6	MEDIUM 1.4	HIGH 4.5	HIGH 5.6	HIGH 5.8
	Potential effects on wildlife as a result of habitat removal.	LOW Loss of habitat Edge Effects Windthrow Sunscald/dessication Part loss of deer wintering yard	LOW Loss of habitat Edge Effects Windthrow Sunscald/dessication Part loss of deer wintering yard	MEDIUM Loss of habitat Edge Effects Windthrow Sunscald/dessication Part loss of deer wintering yard	MEDIUM Loss of habitat Edge Effects Windthrow Sunscald/dessication Part loss of deer wintering yard	MEDIUM Loss of habitat Edge Effects Windthrow Sunscald/dessication Part loss of deer wintering yard
Potential for increased wildlife kills.	Presence of wildlife corridors that the routes pass through.	HIGH Significant connectivity between FEW on both sides of Conc 11, and between MEW and CNF MNR significant deer wintering yard in Lower Mountsberg Creek	HIGH Significant connectivity between PSS on both sides of Campbellville Rd, and with MEW and CNF. MNR significant deer wintering yard in Lower Mountsberg Creek	HIGH Significant connectivity between MEW on both sides of Milburough Rd, and with GJW (and CNF) MNR significant deer wintering yard in Lower Mountsberg Creek	HIGH Significant connectivity between FEW on both sides of Conc 11, and between MEW and CNF. MNR significant deer wintering yard in Lower Mountsberg Creek	HIGH Significant connectivity between PSS on both sides of Campbellville Rd, with MEW on both sides of Millburough Rd and with GJW (and CNF), and with MEW and CNF. MNR significant deer wintering yard in Lower Mountsberg Creek
	Likelihood of increased vehicle wildlife conflicts as a result of increased truck traffic volumes.	HIGH	HIGH	HIGH	HIGH	HIGH
	Likelihood of increased vehicle wildlife conflicts as a result of the reluctance of wildlife to use longer/wider bridge or culvert structures.	MEDIUM	MEDIUM	HIGH	HIGH	HIGH

Detailed Analysis of Alternative Haul Routes

We welcome your comments on the analysis.

Land Use Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Glen Schnarr and Associates						
Potential for disruptive effects to sensitive planned land uses.	Number, character of planned development areas.	1 -Urban (Big Box Retail)	2 -Urban (Big Box Retail) -Chestnut Grove Estates (13 Lot Estate Residential)	1 -Bridlewood Estates (29 Lot Estate Residential)	2 -Urban (Big Box Retail) -Bridlewood Estates (29 Lot Estate Residential)	3 -Urban (Big Box Retail) -Bridlewood Estates (29 Lot Estate Residential) -Chestnut Grove Estates (13 Lot Estate Residential)
	Sensitivity of planned development to increased truck traffic.	LOW Sensitivity	MEDIUM-LOW Sensitivity -Chestnut Grove has large lots, no direct access to Campbellville	MEDIUM-LOW Sensitivity -Currently on Reid Sideroad, a well-travelled truck route -Seclusion, natural buffers -No direct access to Reid from lots	MEDIUM-LOW Sensitivity -Currently on Reid Sideroad, a well-travelled truck route -Seclusion, natural buffers -No direct access to Reid from lots	MEDIUM-LOW Sensitivity -includes both estate residential developments
Potential for removal of planned land uses from road improvements.	Area and sensitivity of planned land use eliminated by road improvements. * TPR = Total Property Required	MEDIUM land use impacts • Agricultural (medium low sensitivity) 10,536 sq.m. (49% of TPR*) • Wood lots and Conservation Lands 1,830 sq m. (9% of TPR) • Business (medium low sensitivity) 1,648 sq.m. (8% of TPR) • Community/Recreational (medium sensitivity) 1,320 sq.m. (6% of TPR) • Residential/vacant (medium high sensitivity) 6,128 sq.m. 29% of TPR)	MEDIUM -LOW land use impacts • Agricultural (medium low sensitivity) 13,156 sq.m. (58% of TPR) • Wood lots and Conservation Lands 0 sq m. (0% of TPR) • Business (medium low sensitivity) 2,177 sq.m. (10% of TPR) • Community/Recreational (medium sensitivity) 392 sq.m. (2% of TPR) • Residential/vacant (medium high sensitivity) 6,903 sq.m. (31% of TPR)	MEDIUM -HIGH land use impacts • Agricultural (medium low sensitivity) 11,824 sq.m. (35% of TPR) • Wood lots and Conservation Lands 3,185 sq m. (9% of TPR) • Business (medium low sensitivity) 2,443 sq.m. (7% of TPR) • Community/Recreational (medium sensitivity) 0 sq.m. (0% of TPR) • Residential/vacant (medium high sensitivity) 166,658 sq.m. (49% of TPR)	MEDIUM -HIGH land use impacts • Agricultural (medium low sensitivity) 19,377 sq.m. (40% of TPR) • Wood lots and Conservation Lands 4,273 sq m. (9% of TPR) • Business (medium low sensitivity) 3,278 sq.m. (7% of TPR) • Community/Recreational (medium sensitivity) 10 sq.m. (0% of TPR) • Residential/vacant (medium high sensitivity) 21,432 sq.m. (44% of TPR)	MEDIUM -HIGH land use impacts • Agricultural (medium low sensitivity) 19,600 sq.m. (39% of TPR) • Wood lots and Conservation Lands 3,185 sq m. (6% of TPR) • Business (medium low sensitivity) 4,021 sq.m. (8% of TPR) • Community/Recreational (medium sensitivity) 207 sq.m. (0% of TPR) • Residential/vacant (medium high sensitivity) 22,820 sq.m. (46% of TPR)
Conformity with applicable plans and polices.	Degree of conformity with Official Plans.	MEDIUM (Moderate) -Hwy 6 is a designated truck route (no restrictions) -Concession 11 not a designated Truck Route and requires municipal permission	MEDIUM (Moderate) -Hwy 6 and Centre Rd. are designated truck routes (no restrictions) -Campbellville Road is designated truck route (with seasonal restrictions) -Concession 11 not a designated Truck Route and requires municipal permission	MEDIUM-HIGH -Twiss Rd. and Reid Sdrd are both designated truck routes (no restrictions) - Campbellville Road is designated truck route (with seasonal restrictions) -Milburough Line not a designated Truck Route and requires municipal permission	MEDIUM (Moderate) -Municipal permission required for Conc. 11 and Milburough Line	MEDIUM (moderate) -Municipal permission required for Concession 11 and Milburough Line
	Degree of conformity with the Greenbelt Plan.	MEDIUM-HIGH -least amount of land required for Road improvements (minimizes the amount of GB traversed, and min. disturbance to landscape)	MEDIUM -relatively small (2nd lowest) amount of land required for road improvements (minimizes the amount of the Greenbelt traversed, and minimizes disturbance to landscape)	MEDIUM-HIGH -relatively small (3rd lowest) amount of land required for road improvements (minimizes amount of GB traversed) -closest / most direct route to majority of market	MEDIUM-LOW -Relatively large (2nd highest) amount of land required for road improvements -does not minimize amount of land traversed within GB -includes most direct route to majority of market	MEDIUM-LOW -Relatively large (highest) amount of land required for road improvements -does not minimize amount of land traversed within GB -includes most direct route to majority of market
	Degree of conformity with the Niagara Escarpment Plan.	HIGH Conformity	HIGH Conformity	HIGH Conformity	HIGH Conformity	HIGH Conformity

Detailed Analysis of Alternative Haul Routes

We welcome your comments on the analysis.

Social Environment and Community Impacts Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Gartner Lee Limited						
Potential for disruption to residents' use and enjoyment of property.	Number of residences fronting and/or backing directly onto a potential truck route. Consideration of truck exposure (No. residences x No. quarry trucks one direction)	940 Truck Exposure Index (535,800)	1005 Truck Exposure Index (572,850)	961 Truck Exposure Index (71,490)	1019 Truck Exposure Index (144,045)	1084 Truck Exposure Index (151,520)
	Ingress and egress interference at residential driveways Consideration of truck exposure (No. ingress and egress interference x No. quarry trucks one direction)	333 Truck Exposure Index (189,810)	392 Truck Exposure Index (223,440)	317 Truck Exposure Index (32,190)	375 Truck Exposure Index (57,405)	434 Truck Exposure Index (64,190)
	Number of defined neighbourhoods along a potential truck route. * Neighbourhoods are defined as a subdivision, a more substantial grouping of houses then a cluster but not a defined community either such as Freelton Consideration of truck exposure (No. defined neighbourhoods x No. quarry trucks one direction)	10 Truck Exposure Index (5,700)	10 Truck Exposure Index (5,700)	**12** Truck Exposure Index (5,220)	12 Truck Exposure Index (4,440)	13 Truck Exposure Index (4,555)
	Ingress and egress interference at roadways used to access neighbourhoods along a potential truck route Consideration of truck exposure (No. ingress and egress interference x No. quarry trucks one direction)	14 Truck Exposure Index (7,980)	14 Truck Exposure Index (7,980)	16 Truck Exposure Index (9,210)	16 Truck Exposure Index (4,105)	17 Truck Exposure Index (4,220)
Potential for effects on community character	Qualitative assessment of likely changes to the unique or distinctive qualities of the communities potentially affected (i.e., physical, economic and/or socio-cultural features of the communities)	LOW: This route affects the community of Morriston, and to a lesser extent the communities of Freelton and Milgrove because they are located off the main highway. 31 businesses or institutions that support the rural character of this community are located along this route. 10 defined neighbourhoods along this route.	MEDIUM: This route affects the communities of Morriston, Mountsberg and to a lesser extent the communities of Freelton and Milgrove because they are located off the main highway. 37 businesses or institutions that support the rural character of this community are located along this route. 10 defined neighbourhoods along this route.	LOW: This route affects the community of Morriston, and to a lesser extent the communities of Freelton and Milgrove because they are located off the main highway. 30 businesses or institutions that support the rural character of this community are located along this route. 12 defined neighbourhoods along route.	LOW-MEDIUM This route affects the community of Morriston and to a lesser extent the communities of Freelton and Milgrove because they are located off the main highway. 37 businesses or institutions that support the rural character of this community are located along this route. 12 defined neighbourhoods along this route.	HIGH This route affects the community of Mountsberg, Morriston and to a lesser extent the communities of Freelton and Milgrove because they are located off the main highway. 43 businesses or institutions that support the rural character of this community are located along this route. 13 number of defined neighbourhoods along this route.
Potential for effects on community cohesion	Qualitative assessment of likely changes to community cohesion due to disruption and/or displacement effects, potential for voluntary out-migration and creation of a barrier effects due to truck traffic. Note: The community of Freelton and Milgrove is located along the route on highway 6; however, this is a major road that already experiences heavy traffic. The Freelton and Milgrove town centres are located to the north of highway 6; therefore, the effect on community cohesion in these communities is considered low.	**MEDIUM:** The haul route travels along highway 6 through the main street/town centre of the Village of Morriston therefore bisecting the community. This route does not bisect any defined neighbourhoods or clusters.	**HIGH:** The haul route travels along highway 6 through the main street/town centre of the Village of Morriston; and along Centre street; therefore bisecting the communities of Mountsberg and Morriston. This route does not bisect any defined neighbourhoods or clusters.	**LOW:** Some trucks may travel along highway 6 through the main street/town centre of the Village of Morriston therefore bisecting the community. This route does not bisect any defined neighbourhoods or clusters.	**MEDIUM:** The haul route travels along highway 6 through the main street/town centre of the Village of Morriston therefore bisecting the community. This route does not bisect any defined neighbourhoods or clusters.	**HIGH:** The haul route travels along highway 6 through the main street/town centre of the Village of Morriston; and along Centre street; therefore bisecting the communities of Mountsberg and Morriston. This route does not bisect any defined neighbourhoods or clusters.

We welcome your comments on the analysis.

Social Environment and Community Impacts Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Gartner Lee Limited						
Potential for disruption to residents' use and enjoyment of property	Change in the existing character of the road					
	Highway 6 (Hwy 401 to Hwy 403)	LOW Impact	LOW Impact		LOW Impact	LOW Impact
	Concession 11 (Hwy 6 to Centre)-	HIGH Impact			MEDIUM Impact	
	Concession 11 (Centre to Milburough	LOW Impact	LOW Impact		LOW Impact	LOW Impact
	Centre (Concession 11 to Campbellville		HIGH Impact			MEDIUM Impact
	Campbellville (Hwy 6 to Centre)		LOW Impact			LOW Impact
	Milburough (Concession 11 to Campbellville)-			HIGH Impact	HIGH Impact	HIGH Impact
	Campbellville (Milburough to Twiss)			MEDIUM-HIGH Impact	MEDIUM -HIGH Impact	MEDIUM-HIGH Impact
	Twiss (Campbellville to Reid)			LOW Impact	LOW Impact	LOW Impact
	Reid Sideroad (Twiss to Guelph Line)			LOW Impact	LOW Impact	LOW Impact
Potential for disruption to users of operations at recreational and community features and/or institutions.	Number of recreational or community features and/or institutions located along a potential truck route. Consideration of truck exposure (No. community features x No. quarry trucks one direction)	21 Truck Exposure Index (11,970)	25 Truck Exposure Index (14,250)	27 Truck Exposure Index (5,190)	29 Truck Exposure Index (6,055)	33 Truck Exposure Index (6,515)
	Number of sensitive / vulnerable recreational or community features and/or institutions. Consideration of truck exposure (No. vulnerable community features x No. quarry trucks one direction)	18 Truck Exposure Index (10,260)	22 Truck Exposure Index (12,540)	24 Truck Exposure Index (5,040)	26 Truck Exposure Index (5,710)	30 Truck Exposure Index (6,170)
	Ingress and egress interference at entrances to recreational or community features and/or institutions. Consideration of truck exposure (No. ingress and egress interference x No. quarry trucks one direction)	16 Truck Exposure Index (9,120)	20 Truck Exposure Index (11,400)	14 Truck Exposure Index (3,660)	21 Truck Exposure Index (4,455)	26 Truck Exposure Index (5,030)
Potential for displacement/ removal of residents & residential property from road improvements.	Number and area of residences/residential property required (partial removals).	58 6,128 sqm	123 6,903 sqm	79 16,658 sqm	137 21,432 sqm	202 22,820 sqm
	Number and area of residences/residential properties required (full displacement)	None	None	None	None	None
	Number of vulnerable residents/households displaced	None	None	None	None	None

We welcome your comments on the analysis.

Social Environment and Community Impacts Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Gartner Lee Limited						
Potential for displacement/ removal of recreational or community features and/or institutions.	Number and area of recreational or community features (including trails, bicycle routes, parks and open space) and/or institutional properties required (partial removals).	There is 1 parks and community institutions along this route. There is potential for 1,320 sqm partial displacement. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 4 parks and community institutions along this route. There is potential for 392 sqm partial displacement. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 2 parks and community institutions along this route. There is potential for 0 sqm partial displacement. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 3 parks and community institutions along this route. There is potential for 10 sqm partial displacement. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 6 parks and community institutions along this route. There is potential for 207 sqm partial displacement. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.
	Number and area of recreational or community features (including trails, bicycle routes, parks and open space) and/or institutional properties required (full displacement).	There are 6 parks and community institutions along this route. None will require full removals. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 8 parks and community institutions along this route. None will require full removals. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 4 parks and community institutions along this route. None will require full removals. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 10 parks and community institutions along this route. None will require full removals. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.	There are 12 parks and community institutions along this route. None will require full removals. After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians and cyclists.
	Number of sensitive / vulnerable recreational or community features and institutions displaced.	There are 16 sensitive / vulnerable recreational or community features and institutions that may be impacted by the route. The route will not displace any of these features.	There are 19 sensitive / vulnerable recreational or community features and institutions that may be impacted by the route. The route will not displace any of these features.	There are 16 sensitive / vulnerable recreational or community features and institutions that may be impacted by the route. The route will not displace any of these features.	There are 22 sensitive / vulnerable recreational or community features and institutions that may be impacted by the route. The route will not displace any of these features.	There are 25 sensitive / vulnerable recreational or community features and institutions that may be impacted by the route. The route will not displace any of these features.
RWDI Air Inc						
Noise impacts on community	No of residences experiencing changes in noise levels: • 0 to 3 dB • > 3 to 5 dB • > 5 to 10 dB • > 10 dB	 • 1037 • 85 • 30 • 57	 • 998 • 85 • 48 • 75	 • 12 • 0 • 83 • 42	 • 809 • 85 • 107 • 99	 • 1085 • 85 • 125 • 117
	No of Schools, Daycares, Senior Housing on route	• 0	• 1 • Mountsberg Community Centre	• 0	• 0	• 1 • Mountsberg Community Centrre
	No of Churches or Places of worship on route [N1]	• 1 • Seventh Day Adventist	• 2 • Seventh Day Adventist • Mountsberg Baptist	• 1 • St. David's Presbyterian	• 2 • St. David's Presbyterian • Seventh Day Adventist	• 3 • St. David's Presbyterian • Seventh Day Adventist • Mountsberg Baptist
	Relative Evaluation Score [N1]	• 567	• 879	• 551	• 1100	• 1412
	Note N1: Quantitative Noise Evaluation score is calculated as follows: Number of Residences in 3 to 5 dB category x 1 + Number of Residences in 5 to 10 dB category x 3 + Number of Residences in > 10 dB category x 6 + Number of Schools, Daycares, and Senior Housings x 100 + Number of Places of Worship x 50 Evaluation Score For Alternative 3, does not include 60 truck movements per day along Highway 6, as this represents an negligible increase over existing conditions For Alternatives 1, 2, 4 and 5, does not include the United Church of Hamilton (1552 Hwy 6) as changes are insignificant in this area					

We welcome your comments on the analysis.

Social Environment and Community Impacts Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
RWDI Air Inc						
Air quality impacts on community	Number of residences and that would experience potential air quality impacts as a result of tail pipe emissions (<200m from roadway). [AQ1]	• 1209 receptors from 10m to 500m from the edge of the roadway • 834 Receptors less than 200 m from edge of roadway • • Quantitative Rating: 3599	• 1206 receptors from 10m to 500m from the edge of the roadway • 857 Receptors less than 200 m from roadway • Quantitative Rating: 3781	• 137 receptors from 10m to 500m from the edge of the roadway • 65 Receptors less than 200 m from roadway • Quantitative Rating: 212	• 1350 receptors from 10m to 500m from the edge of the roadway • 900 receptors less than 200 m from roadway • Quantitative Rating: 3306	• 1347 receptors from 10m to 500m from the edge of the roadway • 923 Receptors less than 200 m from roadway • Quantitative Rating: 3993
	Note AQ1: Quantitative Air Quality Evaluation score is calculated as follows (used for air quality, dust, and potential human health impacts): No of residences within 500 m of roadway x 1 + No of residences located on downwind side of roadway with respect to prevailing winds x 1 + No of residences located downwind side of roadway with respect to prevailing winds x 1 + No of residences located <10m from Roadway x 4 + No of residences located between 10 and 20m from roadway x 2 + No of residences located between 20 and 50m from roadway x 1 + No of residences where the speed limit is >80km/hour x 2 + No of residences where the shoulder is unpaved x 2 + No of residences where traffic increase due to hauling increases average traffic counts by >200% x 5 + No of residences where traffic increase due to hauling increases average traffic counts by >100% x 3 + No of residences where traffic increase due to hauling increases average traffic counts by >50% x 1 + No. of Schools, Daycares, and Senior Housings x 100 + No. Places of Worship x 50 Evaluation Score For Alternative 3, does not include 60 truck movements per day along Highway 6, as this represents an negligible increase over existing conditions For Alternatives 1, 2, 4 and 5, does not include the United Church of Hamilton (1552 Hwy 6) as changes are insignificant in this area					
Dust impacts on community	Number of residences likely to experience dust impacts as a result of additional truck traffic. [AQ1]	1209 receptors from 10m to 500m from the edge of the roadway 834 Receptors less than 200 m from edge of roadway Quantitative Rating: 3599	1206 receptors from 10m to 500m from the edge of the roadway 857 Receptors less than 200 m from roadway Quantitative Rating: 3781	137 receptors from 10m to 500m from the edge of the roadway 65 Receptors less than 200 m from roadway Quantitative Rating: 212	1350 receptors from 10m to 500m from the edge of the roadway 900 receptors less than 200 m from roadway Quantitative Rating: 3306	1347 receptors from 10m to 500m from the edge of the roadway 923 Receptors less than 200 m from roadway Quantitative Rating: 3993
	Note AQ1: See Notes portion of "Air quality impacts on community" section for note AQ1 and explanation of relative evaluation score					
Vibration impact on community	Number of residences likely to experience vibrational impacts as a result of increased truck traffic. [V1]	LOW	LOW	LOW	LOW	LOW
	Note V1: No residences are expected to be adversely impacted by road traffic related vibration. Alternatives are equally preferable.					
Potential for health impacts on community	Number of residences (receptors) within 200m of the haul routes that would potentially be exposed to substances resulting from tail pipe emissions due to air quality impacts related to increased truck traffic. [AQ1][HH1]	834 Receptors less than 200 m from edge of roadway Quantitative Rating: 3599	857 Receptors less than 200 m from roadway Quantitative Rating: 3781	65 Receptors less than 200 m from roadway Quantitative Rating: 212	900 receptors less than 200 m from roadway Quantitative Rating: 3306	923 Receptors less than 200 m from roadway Quantitative Rating: 3993
	Note AQ1: See Notes portion of "Air quality impacts on community" section for note AQ1 and explanation of relative evaluation score Note HH1: Potential health impacts due to additional haul route traffic are directly related to the emissions as a part of the air quality assessment. Alternative Route #3 has a relatively lower potential for air quality impacts and has less residences along the route. Therefore, from a human health perspective, this route represents the least predicted impact. Utilize the resident counts and rankings from the air quality section					

Detailed Analysis of Alternative Haul Routes

Economic Environment and Business Impact Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Gartner Lee Limited						
Potential for disruption to business enterprises.	Number of business enterprises fronting and/or backing along a potential truck route. Consideration of truck exposure (No. businesses x No. quarry trucks one direction)	153 Truck Exposure Index (87,210)	156 Truck Exposure Index (88,920)	163 Truck Exposure Index (12,990)	168 Truck Exposure Index (24,420)	171 Truck Exposure Index (24,765)
	Number of sensitive / vulnerable business enterprises fronting and/or backing along a potential truck route Consideration of truck exposure (No. sensitive businesses x No. quarry trucks one direction)	91 Truck Exposure Index (51,870)	97 Truck Exposure Index (55,290)	101 Truck Exposure Index (11,130)	106 Truck Exposure Index (17,290)	111 Truck Exposure Index (17,865)
	Ingress and egress interference at entrances to business enterprises. Consideration of truck exposure (No. ingress and egress x No. quarry trucks one direction)	140 Truck Exposure Index (79,800)	146 Truck Exposure Index (83,220)	130 Truck Exposure Index (31,440)	160 Truck Exposure Index (35,740)	165 Truck Exposure Index (36,315)
Potential for removal of business enterprises and/ or property.	Number and area of business enterprise and/or other commercial or industrial property required (partial removals).	5 1,648 sqm	8 2,177 sqm	15 2,443 sqm	20 3,278 sqm	23 4,021 sqm
	Number and area of business enterprise and/or other commercial/industrial property required (full displacement)	None	None	None	None	None
	Number of sensitive / vulnerable business enterprises displaced.	None	None	None	None	None
Potential magnitude of effects on property values.	Qualitative assessment of the potential magnitude of effects on property values due to changes in traffic, traffic noise and roadway visibility at residential properties. Assessment is based on noise and air quality analysis, driveway exposure index, and number of residences fronting and/or backing directly onto a potential truck route	LOW - MEDIUM	MEDIUM - HIGH	LOW	MEDIUM	HIGH
RWDI Air Inc.						
Noise impacts on businesses	Number of businesses expected to experience increases in noise levels over future baseline [N1, N2]	3	22	8	11	30
	Note N1: Industrial and agricultural not included. Note N2: Does not include businesses along Highway 6. Due to existing background traffic, changes due to the proposal will be insignificant at all businesses along Highway 6 portions of the haul routes.					
Air quality impacts on businesses	Number of businesses along the proposed haul route(s) affected dust as a result of additional truck traffic [AQ1, AQ2]	3	22	8	11	30
	Note AQ1: Industrial and agricultural not included. Note AQ2: Does not include businesses along Highway 6. Due to existing background traffic, changes due to the proposal will be insignificant at all businesses along Highway 6 portions of the haul routes					
Dust impacts on businesses	Number of businesses along the proposed haul route(s) affected dust as a result of additional truck traffic [AQ1, AQ2]	3	22	8	11	30
	Note AQ1: Industrial and agricultural not included. Note AQ2: Does not include businesses along Highway 6. Due to existing background traffic, changes due to the proposal will be insignificant at all businesses along Highway 6 portions of the haul routes					

We welcome your comments on the analysis.

Economic Environments and Business Impacts Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Conna Consulting Inc.						
Potential for effect on agricultural operations.	Number and type of farms along the haul route potentially disrupted by truck traffic. Consideration of Truck Exposure (No. farms x No. quarry trucks one direction)	Equestrian (12) Other livestock (3) Cash crop (22) Agricultural Market/Nursery (5) **Total (42)** Truck Exposure Index (23,940)	Equestrian (12) Other livestock (5) Cash crop (27) Agricultural Market/Nursery (5) **Total (49)** Truck Exposure Index (27,930)	Equestrian (7) Other livestock (3) Cash crop (18) Agricultural Market/Nursery (4) **Total (32)** Truck Exposure Index (3,810)	Equestrian (15) Other livestock (3) Cash crop (24) Agricultural Market/Nursery (5) **Total (47)** Truck Exposure Index (7,105)	Equestrian (15) Other livestock (5) Cash crop (29) Agricultural Market/Nursery (5) **Total (54)** Truck Exposure Index (7,910)
	Area (sqm) and productivity/value of cropland removed for road improvements. Cropland is a subset of farm property	LOW 3,685	MEDIUM 8,066	MEDIUM 2,612	LOW-MEDIUM 4,945	MEDIUM 7,201
	Number and area (sqm) of farm properties required for road improvements. Considered a farm property if the lot is greater than 10 acres and can include cropland.	**24** 10,536 sq.m.	**40** 13,386 sq.m.	**25** 11,824 sq.m.	**49** 19,377 sq.m.	**65** 19,600 sq.m.

Cultural and Heritage Resources Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Archaeologix Inc.						
Potential for disturbance to built heritage/cultural features.	Number and character of built heritage features potentially affected by truck traffic. Note: Highway 6 has heritage structures requiring further assessment in the villages of Freelton and Morriston (both treated as cultural landscape units) but their impact is already moderated by the heavier traffic of Highway 6 compared to the rest of the study area. Consideration of Truck Exposure (No. Built Heritage features x No. quarry trucks one direction)	There were 6 built heritage features (including 2 subsumed under a cultural landscape unit) along this route: five houses and a barn dating from *c.*1840 to *c.*1900. The character of the built heritage is highly significant given some of the buildings have been listed in the City of Hamilton heritage inventory. Truck Exposure Index (3,420)	There were 20 built heritage features (including 6 subsumed under a cultural landscape unit) along this route: 15 houses, two barns, and a church with its associated cemetery and rectory dating from *c.*1835 to 1922. The character of the built heritage is highly significant given some of the buildings have been listed in the City of Hamilton heritage inventory or designated under Part IV of the *Ontario Heritage Act*. Truck Exposure Index (8,550)	There were 2 built heritage features along this route excluding Highway 6: two houses dating from *c.*1860 to *c.*1890. Given the presence of not many heritage properties, the character of the built heritage is moderately significant. Truck Exposure Index (1,140)	There were 8 built heritage features (including 2 subsumed under a cultural landscape unit) along this route: seven houses and a barn dating from *c.*1840 to *c.*1900. The character of the built heritage is highly significant given some of the buildings have been listed in the City of Hamilton heritage inventory. Truck Exposure Index (1,600)	There were 22 built heritage features (including 6 subsumed under a cultural landscape unit) along this route: 17 houses, two barns, and a church with its associated cemetery and rectory dating from *c.*1835 to 1922. The character of the built heritage is highly significant given some of the buildings have been listed in the City of Hamilton heritage inventory or designated under Part IV of the *Ontario Heritage Act*. Truck Exposure Index (2,750)
	Number of heritage properties removed from construction of road improvements (distinguish between partial and full removals). (Understanding is that heritage property refers to the building itself-Potential Land removals have been accounted for in other sections)	LOW No heritage properties would be removed since they are far enough back from the road, but any identified cultural landscape units could be impacted by the construction and would need further assessment to see what preservation measures need to be undertaken. Along this route, 2 cultural landscape units were identified.	LOW No heritage properties would be removed since they are far enough back from the road, but any identified cultural landscape units could be impacted by the construction and would need further assessment to see what preservation measures need to be undertaken. Along this route, 5 cultural landscape units were identified.	LOW No heritage properties would be removed since they are far enough back from the road, but any identified cultural landscape units could be impacted by the construction and would need further assessment to see what preservation measures need to be undertaken. Along this route, 0 cultural landscape units were identified.	LOW No heritage properties would be removed since they are far enough back from the road, but any identified cultural landscape units could be impacted by the construction and would need further assessment to see what preservation measures need to be undertaken. Along this route, 2 cultural landscape units were identified.	LOW No heritage properties would be removed since they are far enough back from the road, but any identified cultural landscape units could be impacted by the construction and would need further assessment to see what preservation measures need to be undertaken. Along this route, 5 cultural landscape units were identified.
Potential for effects on archaeological resources.	Potential for effects on archaeological resources as a result of road improvements (as reflected through archaeological potential). Note: Highway 6 currently has no standing archaeological issues that will be affected by increased traffic, *assuming that no road expansion will be made along Highway 6*.	Approximately 5.3 km of the roadside (measuring the two sides of the road separately) or 44.91% of this route exhibits moderate to HIGH archaeological potential that would need Stage 2 archaeological assessment to determine if any archaeological remains would be impacted.	Approximately 11.2 km of the roadside (measuring the two sides of the road separately) or 61.54% of this route exhibits moderate to HIGH archaeological potential that would need Stage 2 archaeological assessment to determine if any archaeological remains would be impacted.	Approximately 5.7 km of the roadside (measuring the two sides of the road separately) or 34.76% of this route exhibits moderate to HIGH archaeological potential that would need Stage 2 archaeological assessment to determine if any archaeological remains would be impacted.	Approximately 11.0 km of the roadside (mea suring the two sides of the road separately) or 39.01% of this route exhibits moderate to HIGH archaeological potential that would need Stage 2 archaeological assessment to determine if any archaeological remains would be impacted.	Approximately 16.9 km of the roadside (measuring the two sides of the road separately) or 48.84% of this route exhibits moderate to HIGH archaeological potential that would need Stage 2 archaeological assessment to determine if any archaeological remains would be impacted.

Detailed Analysis of Alternative Haul Routes

We welcome your comments on the analysis.

Transportation Analysis Table

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
iTRANS Consulting Inc.						
Change in road service level.	Change in road level of service/congestion (considers road section, length, change in level of service). Total average delay increase per route per vehicle	75 seconds	77 seconds	52 seconds	56 seconds	53 seconds
	Unsignalized (Total average delay increase per route per vehicle)	4 seconds	6 seconds	41 seconds	34 seconds	34 seconds
	Signalized (Total average delay increase per route per vehicle)	70 seconds	70 seconds	11 seconds	23 seconds	20 seconds
	Signalized (Total average delay increase per route per vehicle)	0.04	0.04	0.01	0.01	0.01
	Change in access levels for road users. (Change in delay to side street traffic in 2031 with and without quarry truck traffic)	0 seconds	2 seconds	3 seconds	2 seconds	1 second
	Effects on other roadways as a result of traffic diversion.	LOW Impact No traffic diversion as a result of quarry operations	LOW Impact No traffic diversion as a result of quarry operations	LOW Impact No traffic diversion as a result of quarry operations	LOW Impact No traffic diversion as a result of quarry operations	LOW Impact No traffic diversion as a result of quarry operations
	Potential for delay to quarry trucks at level rail crossings. (Percent chance of being delayed)	0%	0%	5.2% at Twiss Crossing <5.2% at Campbellville Crossing	5.2% at Twiss Crossing <5.2% at Campbellville Crossing	5.2% at Twiss Crossing <5.2% at Campbellville Crossing
Potential for change in road safety level.	Potential for increase in collision frequency and severity. (Difference in safety index with and without the quarry in 2031) Note: The percentage change in collisions (expressed as equivalent property damage collisions) that are expected as a result in the increase in volumes due to the quarry traffic	1.4%	1.4%	0.8%	0.9%	0.9%
	Number of access points along the haul route.	494	523	467	548	577
	Number of intersections along the haul route. Consideration of Truck Exposure (No. intersections x No. quarry trucks one direction)	43 Truck Exposure Index (24,510)	47 Truck Exposure Index (26,790)	52 Truck Exposure Index (9,660)	58 Truck Exposure Index (11,770)	62 Truck Exposure Index (12,230)
	Truck-rail exposure index at level rail crossings (daily # quarry trucks x daily # trains).	0 No level rail crossings	0 No level rail crossings	25,000 at Twiss crossing < 25,000 at Campbellville crossing	20,020 at Twiss crossing <20,020 at Campbellville Crossing	20,020 at Twiss crossing <20,020 at Campbellville Crossing
	Driveway exposure index (# driveways x quarry truck traffic)	281,580	298,110	49,440	86,385	89,720

We welcome your comments on the analysis.

Transportation Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
iTRANS Consulting Inc.						
Potential for change in road safety level (Continued)	Number of sections with limited sight lines and/or steep grades on non-provincial highways (by direction)	5	9	10	15	19
	Number of intersections with limited sight lines and/or steep grades on non-provincial highways	1	3	3	4	6
	School bus route lengths (km) along the haul route (Frequency of school bus trips x segment length). Consideration of Truck Exposure (bus km x No. quarry trucks one direction)	196 km Truck Exposure Index (111,914)	264 km Truck Exposure Index (150,571)	222 km Truck Exposure Index (41,457)	261 km Truck Exposure Index (51,890)	329 km Truck Exposure Index (59,690)
	Conflict with agricultural vehicles and equipment.	MEDIUM	HIGH	LOW	MEDIUM	HIGH
Change in Road Function	Increase in Traffic: ▪ daily expressed as the maximum traffic increase that would be experienced along a portion of the alternative haul route ▪ average increase experienced on a haul route link expressed as a percentage	1308 vehicles 150%	1308 vehicles 73%	1150 vehicles 59%	920 vehicles 47%	920 vehicles 33%
	Required change in road classification	LOW-MEDIUM no change in road classification	LOW no change in road classification	LOW-MEDIUM no change in road classification but there will be a change in the environment from residential to mixed traffic	LOW-MEDIUM no change in road classification	LOW-MEDIUM no change in road classification
	Road widening required					
	Highway 6 (Hwy 401 to Hwy 403)	No widening	No widening	No widening	No widening	No widening
	Concession 11 (Hwy 6 to Centre)-	Widen paved surface from approximately 6.17 m to 12.50 m			Widen paved surface from approximately 6.17 m to 11.00 m	
	Concession 11 (Centre to Milburough	Widen paved surface from 6.46 m to 10.50 m	Widen paved surface from 6.46 m to 10.50 m		Widen paved surface from 6.46 m to 10.50 m	Widen paved surface from 6.46 m to 10.50 m
	Centre (Concession 11 to Campbellville		Widen paved surface from approximately 6.70 m to 12.50 m			Widen paved surface from approximately 6.70 m to 11.00 m
	Campbellville (Hwy 6 to Centre)		Widen paved surface from approximately 6.41 m to 10.50 m			Widen paved surface from approximately 6.41 m to 10.50 m
	Milburough (Concession 11 to Campbellville)-			Widen paved surface from 6.70 m to 12.50 m	Widen paved surface from 6.70 m to 12.50 m	Widen paved surface from 6.70 m to 12.50 m
	Campbellville (Milburough to Twiss)			Widen paved surface from 6.51 m to 12.50 m	Widen paved surface from 6.51 m to 12.50 m	Widen paved surface from 6.51 m to 12.50 m
	Twiss (Campbellville to Reid)			Widen paved surface from 7.00 m to 10.50 m	Widen paved surface from 7.00 m to 10.50 m	Widen paved surface from 7.00 m to 10.50 m
	Reid Sideroad (Twiss to Guelph Line)			Widen paved surface from 6.50 m to 10.50 m	Widen paved surface from 6.50 m to 10.50 m	Widen paved surface from 6.50 m to 10.50 m

We welcome your comments on the analysis.

Transportation Analysis Table (Continued)

Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
iTRANS Consulting Inc.						
Potential for conflicts with cyclists.	Length of route coinciding with designated or suggested bike routes	2.5 km	3.3 km	6.1 km	8.6 km	9.4 km
	Length of route without adequate shoulders for cyclists	LOW After the proposed cross-section changes are implemented there is 0 km of designated cycling routes without adequate shoulders.	LOW After the proposed cross-section changes are implemented there is 0 km of designated cycling routes without adequate shoulders.	LOW After the proposed cross-section changes are implemented there is 0 km of designated cycling routes without adequate shoulders.	LOW After the proposed cross-section changes are implemented there is 0 km of designated cycling routes without adequate shoulders.	LOW After the proposed cross-section changes are implemented there is 0 km of designated cycling routes without adequate shoulders.
Potential for conflicts with pedestrians.	Number of schools along the route	No schools along this route	No schools along this route	No schools along this route	No schools along this route	No schools along this route
	Number of parks and community centres excluding Highway 6	1 parks and community institutions ▪ Lawson Park	4 parks and community institutions ▪ Lawson Park ▪ Memorial Park ▪ Mountsberg Community Centre (Historic School House) ▪ Mountsberg Baptist Church and Cemetery	2 parks and community institutions ▪ Campbellville New Ball Park ▪ Campbellville Emergency Response Centre (Firehall#2)	3 parks and community institutions ▪ Lawson Park ▪ Campbellville New Ball Park ▪ Campbellville Emergency Response Centre (Firehall#2)	6 parks and community institutions ▪ Lawson Park ▪ Memorial Park ▪ Mountsberg Community Centre (Historic School House) ▪ Mountsberg Baptist Church and Cemetery ▪ Campbellville New Ball Park ▪ Campbellville Emergency Response Centre (Firehall#2)
	Length of route without adequate shoulders/sidewalks for pedestrians	LOW After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians. There are no sidewalks along the route.	LOW After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians. There are no sidewalks along the route.	LOW After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians. There are no sidewalks along the route.	LOW After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians. There are no sidewalks along the route.	LOW After the proposed cross-section changes are implemented there is 0 km of the route without adequate shoulders for pedestrians. There are no sidewalks along the route.

Cost Analysis Table

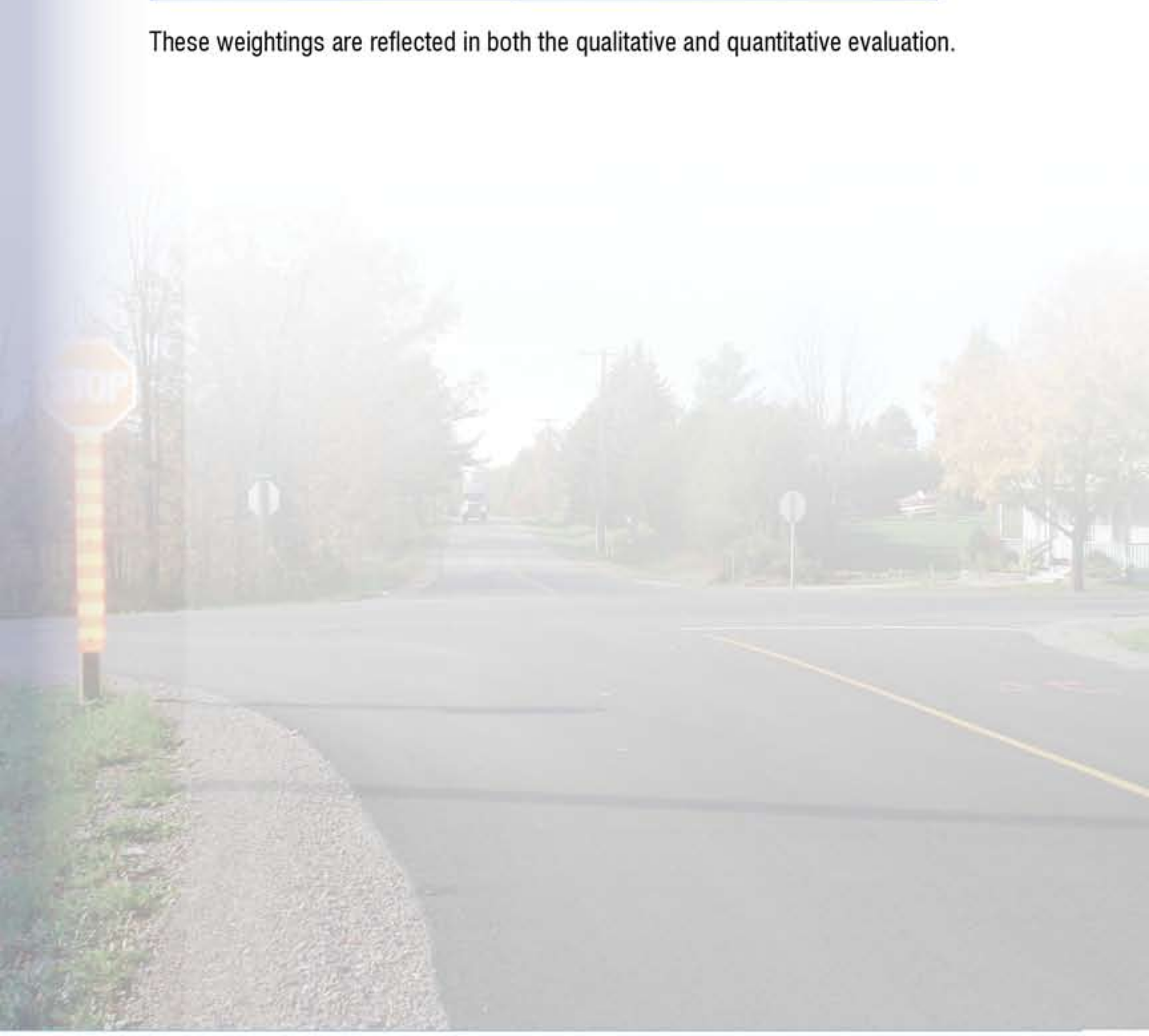
Criteria	Indicators	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
iTRANS Consulting Inc., RJ. Burnside, and Golder						
Estimated infrastructure costs.	Estimated cost for all required road and other infrastructure improvements.	$ 5,167,000	$ 6,586,000	$ 6,960,000	$ 11,563,000	$ 12,823,000
	Please Note Assumptions made. 1. Widening to be Centered on existing Road CL. 2. No Change in Existing Road Grade 3. Depth of Granular 'A' 150mm, 'B' 450mm Asphalt 150mm 4. Full Width of Road to be Repaved with 50mm of Asphalt 5 .Paved Shoulder/Buffer/Bike Path Paved with 50mm Asphalt. 6, Item Cost- Excavation $14/cum,Gran 'A' $ 25/T, Gran 'B' $20/T Asphalt $ 80/T, Sawcut $ 10/lm 7. No Allowance for Extra Cut or Fill. 8. No Allowance for Additional Property Required.					
	Potential for additional costs to the municipality(s) (e.g. impacts to municipal maintenance operations). (km)	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
	Estimated property costs for all required road and other infrastructure improvements.	LOW	LOW	MEDIUM	HIGH	HIGH

How were the Major Criteria Weighted

Based on input received from the public and from agency stakeholders, the following weighting has been given to the major criteria and used in the evaluation of the alternative haul routes:

Major Criteria	Relative Weighting
Aquatic Environment / Surface Water	More Important
Terrestrial Environment	More Important
Land Uses	Important
Social Environment and Community Impacts	Most Important
Economic Environment and Business Impacts	More Important
Cultural and Heritage Resources	Important
Transportation and Safety	Most Important
Cost	More Important

These weightings are reflected in both the qualitative and quantitative evaluation.



Evaluation Approach

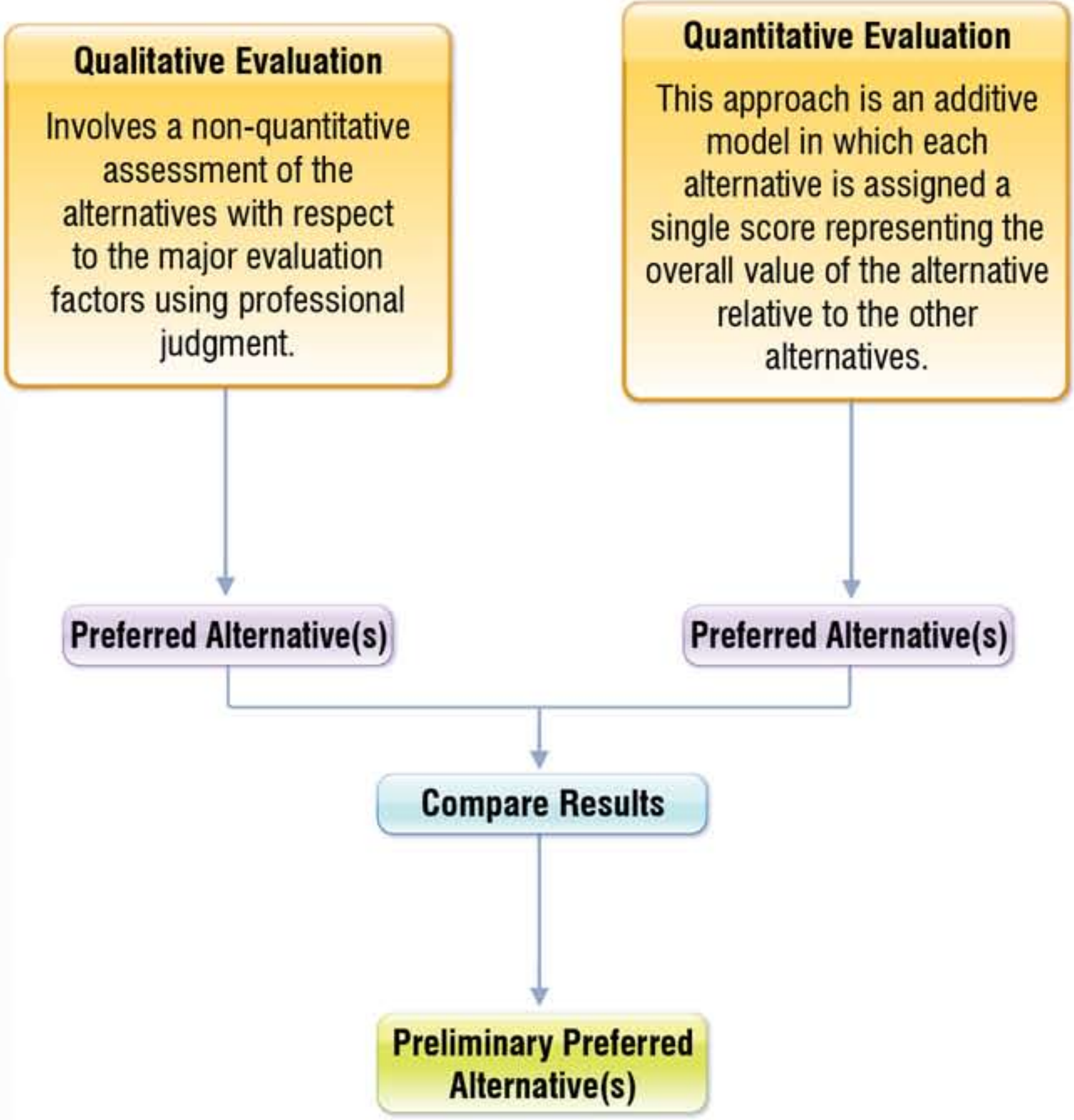
The evaluation of the five alternative haul routes has been conducted in a systematic manner:

- Consistent with standard Ontario Environmental Assessment Procedures,

- A comparative evaluation which involved separate evaluations:
  - qualitative evaluation
  - quantitative evaluation

- Two different evaluation methods which serves two purposes:
  - Identify the sensitivity of the evaluation criteria to a particular route
  - Test if the two methods arrive at the same preliminary preferred haul route.

To arrive at the preliminary preferred alternative we conducted a comparative evaluation using two separate methods to independently arrive at the preferred alternative haul routes. The methodologies applied have been used previously in Environmental Assessments and are consistent with established evaluation procedures. The results of the two methods are then compared to confirm or adjust the preferred alternative(s).



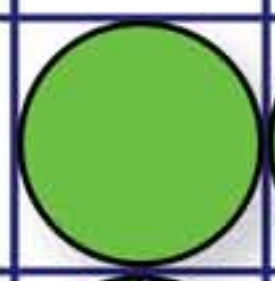
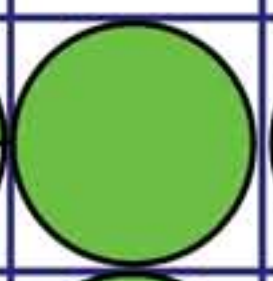
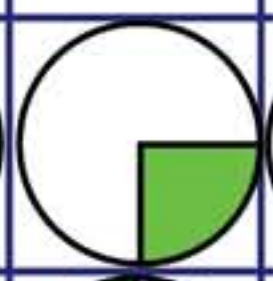
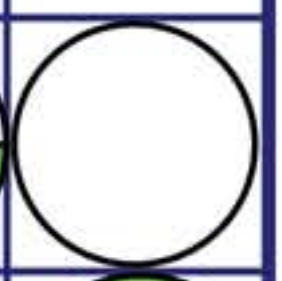
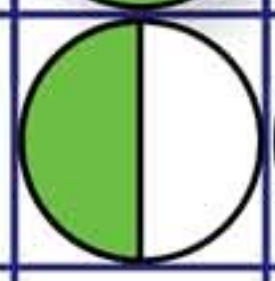
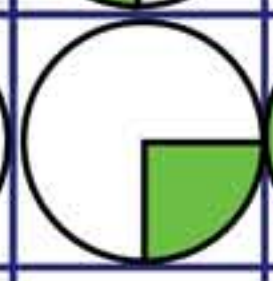
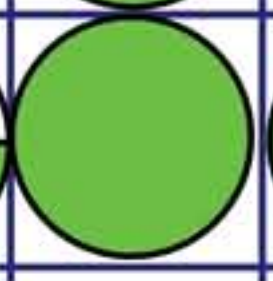
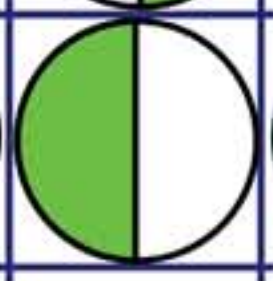
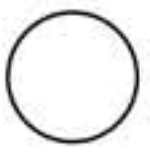
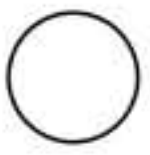
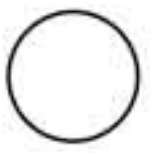
Qualitative Evaluation

The qualitative evaluation involved a non-quantitative assessment of the alternative haul routes with respect to the eight major evaluation factors: Aquatic Environment, Terrestrial Environment, Land Uses, Social Environment, Economic Environment, Cultural Heritage, Transportation and Safety, and Cost. One of the main advantages of this approach is that it considers the main tradeoffs among the alternatives, and therefore highlights the major advantages and disadvantages for each alternative. This approach has been applied in other studies.

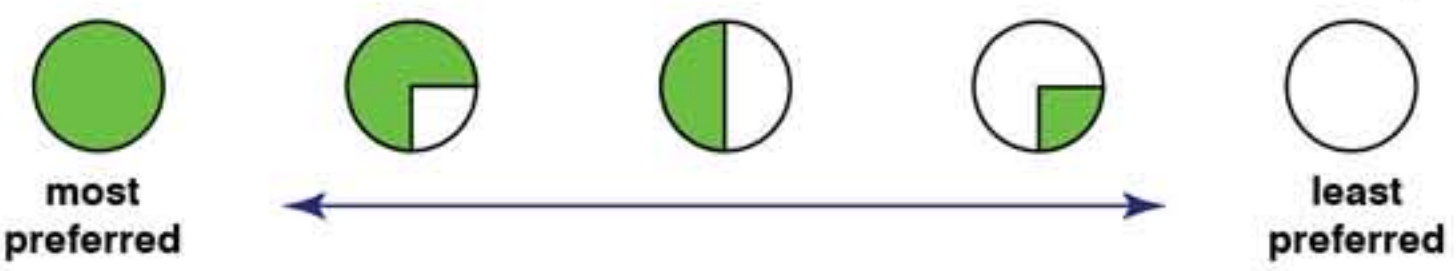
- The project team reviewed the analysis results and discussed the key advantages and disadvantages of each of the alternatives for each of the evaluation factors.
- Each participant applied professional judgment.
- The team evaluated each alternative haul route in terms of the major evaluation factors as "most preferred" alternative haul route to the "least preferred" alternative haul route.
- The project team came to a consensus on the qualitative assessment for each factor, considering public and stakeholder comments on the relative importance of the factors.

Qualitative Evaluation (Continued)

The interim findings from the qualitative evaluation shows that the preferred haul routes in order of preference are: Alternative Haul Route 3, Alternative Haul Route 1, Alternative Haul Route 2, Alternative Haul Route 4, and Alternative Haul Route 5. However, these are only interim findings and may be revised based on input from the public, CART, and agency stakeholders.

	Qualitative Evaluation				
Category	Alternative Haul Route **1**	Alternative Haul Route **2**	Alternative Haul Route **3**	Alternative Haul Route **4**	Alternative Haul Route **5**
Social & Community Impacts (most important)					
Transportation & Safety (most important)					
Aquatic Environment (more important)					
Terrestrial Environment (more important)					
Economic Environment & Business Impacts (more important)					
Cost (more important)					
Land Uses (important))					
Cultural & Heritage Resources (important)					
Overall					

Legend



Quantitative Evaluation

A concurrent numerical evaluation was also used to complement the qualitative evaluation. The approach is an additive model in which each alternative was assigned a single score representing the overall value of the alternative relative to the other alternatives. This methodology has been used in EA studies.

The numerical evaluation methodology applied the following major steps:

1. A relative weight was assigned to each of the eight factors out of 100 points. This weight was determined by a team of specialists. The team of specialists had representatives present from transportation, planning, and environmental disciplines.

   Public input on the importance of the evaluation criteria and indicators was collected via comment sheets, work books, and discussions during the public information centres held in November 2007 and January 2008.

2. Within each category, the individual criteria were assigned weights by the respective specialist, for a total of 100 points.

3. Within each criterion, individual indicators were also assigned a weight out of 100.

4. For each indicator, the alternatives were assessed with respect to their performance, by assigning a rating between 1 and 10. The alternative that achieved the best performance for that indicator was assigned a rating of 10. The remaining alternatives were assigned ratings of less than 10, to be reflective of the relative performance of the alternatives with respect to the best alternative.

   For indicators with quantitative measures which reflected the relative performance of the alternatives, the following formulas were used:

   - Where a high value was less preferred (example, number of homes affected) the following formula was used:

     10-[10{(indicator value-minimum value)/maximum value}]

   - Where a high value was most preferred (example, degree of conformity with official plans) the following formula was used:

     10(indicator value/maximum value)

The use of the above formulae for quantitative indicators enabled the team of specialists to systematically, objectively, and consistently determine the appropriate performance rating for the alternatives. Where the indicators had qualitative measures they were translated into a numeric value using the following scale:

- Low = 1
- Low-Medium = 3
- Medium = 5
- Medium-High=7
- High=10

5. The performance ratings were multiplied by the indicator weights, criteria weights, and factor weights, and then summed for each alternative to arrive at a total score for each alternative. The scores represent the relative value of the alternatives. The alternative with the highest score therefore theoretically represents the best alternative.

6. The analyses were undertaken, using weights established by:
   - The Team of Specialists
   - Individual members of the Team of Specialists
   - Specialists for each factor
   - Public input

Quantitative Evaluation (Continued)

The interim findings from the qualitative evaluation shows that the preferred haul routes in order of preference are: Alternative Haul Route 3, Alternative Haul Route 1, Alternative Haul Route 2, Alternative Haul Route 4, and Alternative Haul Route 5. However, these are only interim findings and may be revised based on input from the public, CART, and agency stakeholders.

	Weighting	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Aquatic Environment						
weighted score	12	60	95	124	83	76
Terrestrial Environment						
weighted score	12	124	124	102	67	66
Land Uses						
weighted score	8	75	79	51	68	67
Social and Community Impacts						
weighted score	26	206	170	264	198	152
Economic Environment and Business Impacts						
weighted score	12	113	73	121	100	63
Cultural and Heritage Resources						
weighted score	6	54	38	61	57	48
Transportation						
weighted score	17	166	143	149	136	115
Cost						
weighted score	6	60	54	53	48	43
Overall Score		856	776	926	759	630
Ranking of Preferred Alternatives		2	3	1	4	5

Summary of Qualitative and Quantitative Evaluation

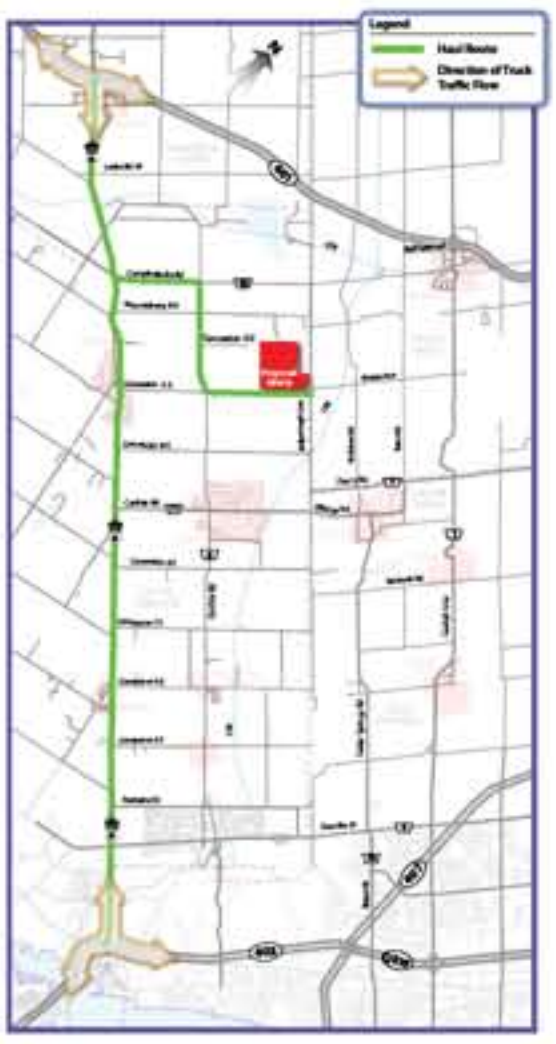
Both the qualitative evaluation and the quantitative evaluation independently arrive at the same conclusion that the preferred haul routes in order of preference are: Alternative Haul Route 3, Alternative Haul Route 1, Alternative Haul Route 2, Alternative Haul Route 4, and Alternative Haul Route 5.

In conclusion the haul routes are presented below in order of preference:

Alternative Haul Route 3
(Most Preferred)

Alternative Haul Route 1
(Next Most Preferred)

Alternative Haul Route 2



Alternative Haul Route 4

Alternative Haul Route 5

Sensitivity Analysis

A sensitivity analysis was carried out for the Quantitative Evaluation to determine if different weights for the factors would change the evaluation results. The sensitivity analysis tests the robustness of the evaluation.

As noted on the Qualitative Evaluation display board the base evaluation results are shown below.

Base Evaluation Results

	Overall Score				
	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Base Weightings	856	776	926	759	630
Ranking	2	3	1	4	5

Sensitivity Analysis #1 – Public Input

In this sensitivity analysis the criteria weights were based on public input derived from public comment sheets and discussions at PIC #2 and PIC #3. Each of the major criteria was assigned a rating of 'most important,' 'more important,' or 'important.' Those ratings were then translated into a numerical format 'most important' = 3, 'more important' = 2, and 'important' = 1. The results are summarized in the table below.

Public Input Sensitivity Analysis Results

	Overall Score				
	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Public Input Weightings	873	792	922	762	637
Ranking	2	3	1	4	5

Using weights developed from public input, sensitivity analysis 1 identified that the preferred haul routes in order of preference are: Alternative Haul Route 3, Alternative Haul Route 1, Alternative Haul Route 2, Alternative Haul Route 4, and Alternative Haul Route 5.

Sensitivity Analysis #2 – Equal Weights

In this sensitivity analysis we gave equal weights to the major criteria. The results are summarized in the table below.

Equal Weights Sensitivity Analysis Results

	Overall Score				
	Alternative Haul Route 1	Alternative Haul Route 2	Alternative Haul Route 3	Alternative Haul Route 4	Alternative Haul Route 5
Equal Weighting	877	799	906	777	659
Ranking	2	3	1	4	5

Sensitivity Analysis 2 identified that the preferred haul routes in order of preference are: Alternative Haul Route 3, Alternative Haul Route 1, Alternative Haul Route 2, Alternative Haul Route 4, and Alternative Haul Route 5.

Sensitivity Analysis Summary

The sensitivity analysis shows that using different weights does not change the order of preference of the alternative haul routes.

We are interested in your comments on the sensitivity analysis and suggestions for additional sensitivity analyses.

Next Steps

The next steps for the Haul Route Study are summarized below.

We will review all comments and suggestions received from the public and stakeholders.

Based on the input we receive from the public, agencies, municipalities, and other stakeholders we will:

- Revise the interim analysis of the impacts of the alternative haul routes
- Revise the interim evaluation (qualitative and quantitative) that compares the alternative haul routes
- Carry out additional sensitivity analysis as required
- Review potential road improvements and mitigating measures for the alternative haul routes
- Recommend a preferred haul route and associated road improvements
- Continue to work closely with CART and other agency stakeholders
- Continue to consider and incorporate public comments
- Hold Public Information Centre #5 to present the draft results of the comparative evaluation and effects assessment

A draft report will be prepared that documents the following:

- Baseline conditions
- Detailed analysis
- Evaluation approach
- Comparative evaluation
- Details on the preferred haul route and the potential effects and recommended mitigation

Changes to the above will be posted on the study website.

The draft report will be circulated to the Combined Aggregate Review Team (CART), affected municipalities, other agencies, and the public for review and comment.

The report will be finalized considering the comments received on the draft report.

Your Input is Important

Have any questions, concerns, or comments?

We invite you to fill in the comment sheets or email us with your comments and suggestions.

Comments are always welcome.

If you wish to be put on our mailing list, require further information, or wish to provide input to the study, you can contact us in the following ways:

Telephone: 1-866-602-0080 (toll free)
Email: communityinfo@stmaryscbm.com
Website: www.flamboroughquarry.ca

Thank You!