4 ALTERNATIVE SOLUTIONS

4.1 Description of Alternative Solutions

The following alternatives were identified for consideration at the planning level to address the problems and opportunities identified in **Section 2.3**:

- "Do Nothing"
- Limit Development
- Travel Demand Management Measures (TDM)
- Improved Transit Services (GO Transit) / Other Modes of Transportation
- Intersection and / or Operational Improvements
- Improvements to Other Roadways Beyond Planned Program
- Improvements to Trafalgar Road

A brief description of each of the planning alternatives is outlined below; this applies to the study area of Trafalgar Road between north of 10 Side Road and Highway 7.

4.1.1 Do Nothing

With the *Do Nothing* alternative, the existing road network will be maintained as status quo. Only planned infrastructure improvements will be in place, for example, widening of Ninth Line, Steeles Avenue, and 10 Side Road (east of Trafalgar Road), as shown in the Halton Region Roads Capital Projects (to 2031).

4.1.2 Limit Development

Under this scenario, there would be more limits placed on land use development. Projections of future travel demands are based on the approved future urban area (Halton Region Official Plan, in accordance with the *Places to Grow*). Limiting development would reduce future travel demands and require fewer infrastructure improvements to be completed.

4.1.3 Travel Demand Management (TDM) Measures

Travel Demand Management measures include measures to reduce the number of vehicles during the peak hours, e.g. carpooling, staggered work hours, etc. These are currently part of Halton Region's overall transportation strategy, and can help manage the rate of growth in travel demand when considered in tandem with other alternatives.

4.1.4 Improved Transit Services (GO Transit) / Other Modes of Transportation

This alternative would involve upgrades to GO Transit services on the Kitchener Line, and provision of facilities for active transportation to accommodate pedestrians and cyclists.

4.1.5 Intersection and / or Operational Improvements

Intersection improvements include the addition of traffic signals, auxiliary lanes (e.g. right turn and left turn lanes) and additional lanes through the intersection. Operational improvements include modifications to signal timing plans, traffic signal interconnect systems, and road user information systems.

4.1.6 Improvements to Other Roadways Beyond Planned Program

This alternative would widen other Regional roadways in the immediate proximity to the Study Area beyond planned improvements (e.g. Steeles Avenue, Ninth Line, and 10 Side Road).

4.1.7 Improvements to Trafalgar Road

Improvements to the Trafalgar Road corridor to address future corridor requirements would involve widening from 2 to 4 general traffic lanes, provision for active transportation, and the consideration of grade separations with CN and Metrolinx railways.

4.2 Analysis and Evaluation of Alternative Solutions

The above-noted planning alternatives were assessed in terms of how they would address the problem under consideration outlined in **Section 2.3**. **Table 4-1** summarizes the analysis and evaluation of the planning alternatives under factor groups such as socio-economic environment, cultural environment, natural environment, transportation and costs. **Sections 4.2.1 to 4.2.7** discuss the results of this evaluation in further detail.

Table 4-1: Analysis and Evaluation of Alternative Solutions

	ALTERNATIVES SOLUTIONS						
FACTORS	**Do Nothing**	**Limit Development**	**Travel Demand Management Measures**	**Improved Transit Service / Other Modes of Transportation**	**Intersection and/or Operational Improvements**	**Improvements to Other Roadways Beyond Planned Program**	**Improvements to Trafalgar Road**
Socio-Economic Environment							
Property Effects / Existing Land Use / Community Effects	• No impact to adjacent properties and existing land use	• No impact to adjacent properties and existing land use	• No impact to adjacent properties and existing land use	• Would likely have some property impact due to the implementation of transit and active transportation related improvements (e.g. bus bays, transit stops, intersection reconstruction, bike lanes, multi-use pathways, etc.)	• Would likely have some property impact particularly for properties in close proximity to the intersections • Minimal impact to overall existing land use	• Improvements on other roadways have already been identified as part of the Region and local Transportation Master Plans. Impact to existing properties would be determined based on respective EA studies • Potential impact to access along the improved roadways	• Property impact generally along the frontage of properties adjacent to Trafalgar Road south of 15 Side Road. • Greater potential for direct property impacts north of 15 Side Road due to proximity of existing houses to Trafalgar Road in Stewarttown. • Some existing accesses on Trafalgar Road will become right-in/right-out only; however, U-Turn will be permitted at signalized intersections • Direct impacts due to realignment of Trafalgar Road in localized area to accommodate the proposed grade separations (CN and Metrolinx)
Consistency with Planning Policies (Official Plan, Transportation Master Plan, Active Transportation Plan)	• Not consistent with the Halton Region Transportation Master Plan • Not consistent with Region and Town's objective to promote Active Transportation	• Not consistent with the planned population and employment growth identified by Halton Region and Town of Halton Hills in conformance with the Provincial Growth Plan	• Consistent with the Region and Town's objectives to manage travel demand • However, this is not consistent within the Region and Town's need to provide additional capacity with the Trafalgar Road corridor	• Consistent with the Region and Town's vision to increase modal share of transit and other transportation methods	• Will not fully address transportation needs in the future	• Improvements on other roadways have already been identified as part of the Region and Town Transportation Master Plans; widening beyond planned program would be inconsistent with existing Regional planning	• Consistent with the Region and Town's Transportation Master Plans and Official Plans to provide additional capacity within the Trafalgar Road corridor
Impacts to Future Development	• Would not provide the transportation network improvements required (e.g. additional capacity) to support future developments (e.g. Vision Georgetown)	• Not consistent with the planned population and employment growth identified by Halton Region and the Town of Halton Hills	• No direct physical impact to future development	• No direct physical impact to future development	• No direct physical impact to future development • Does not provide the infrastructure improvement required for future developments	• Future developments will have to coordinate with the Region and Town to integrate with proposed additional roadway improvements (additional would be required beyond what is identified as the right-of-way in planning documents)	• Future developments will coordinate with the Region and Town to integrate with proposed Trafalgar Road improvements • Widening of Trafalgar Road will support future travel demand generated from future developments

	ALTERNATIVES SOLUTIONS						
FACTORS	**Do Nothing**	**Limit Development**	**Travel Demand Management Measures**	**Improved Transit Service / Other Modes of Transportation**	**Intersection and/or Operational Improvements**	**Improvements to Other Roadways Beyond Planned Program**	**Improvements to Trafalgar Road**
Noise	• Some potential increase in noise level due to increased traffic near noise sensitive areas adjacent to Trafalgar Road when compared to existing conditions	• Likely no significant impact to existing noise sensitive areas adjacent to Trafalgar Road	• Likely no significant impact to existing noise sensitive areas adjacent to Trafalgar Road	• Minimal change in noise level from new transit services	• Minimal change in noise level	• Potential increase in noise level to noise sensitive areas adjacent to the roadways	• Potential increase in noise level to noise sensitive areas adjacent to Trafalgar Road
Cultural Environment							
Archaeological Resources	• A Stage 1 Archaeology Assessment was completed. There are 20 registered sites located within 1 km of the Trafalgar Road corridor. The existing Trafalgar Road right-of-way is previously disturbed and did not require further assessment. Much of the study area outside of the existing right-of-way appears to be undisturbed, and will require a Stage 2 Archaeological Assessment if land is to be impacted. Details may be found in **Appendix G** – Stage 1 Archaeological Assessment.						
Built Heritage Resources / Cultural Landscape	• A built heritage and cultural landscapes review was carried out. Within the study area there are 5 Halton Hills Designated and Heritage Register Phase 1 and 2 Consolidated properties, and 9 properties associated with the historic settlement of Stewarttown. Devereaux House, located at 11494 Trafalgar Road, is the only property designated under Part IV of the Ontario Heritage Act. The heritage features are listed **in Appendix F** Cultural Heritage Resource Assessment.						
	• No impacts to cultural heritage landscapes			• Implementation of transit and/or active transportation facilities (e.g. bus bays and bike lanes) may have minor impacts to features located directly adjacent to the roadway.	• Likely limited impact to built heritage features.	• May have impact to other built heritage features along those roadways.	• Design will be modified to minimize impact to built heritage features where possible (e.g. at Devereaux House). Mitigation measures will be reviewed as required.
Natural Environment							
Fisheries and Aquatic Habitat	• Potential minor impact on fish habitat quality through increased traffic demand and resulting incremental contaminant runoff from existing roads • No net loss of fish habitat	• No net loss of fish habitat	• No net loss of fish habitat	• Incremental effects on fish habitat may be experienced to accommodate transit initiatives such as new stations, etc. These effects will depend on nature of improvements relative to watercourse features • No net loss of fish habitat	• Incremental effects on fish habitat may be experienced to accommodate intersection and/or operational improvements. These effects will depend on nature of improvements relative to watercourse features • No net loss of fish habitat	• Potential fish habitat effects associated with culvert replacements / extensions for road widening – dependent on nature of undertaking and agency liaison • Increased contaminant runoff volumes may be generated with widened pavement surface and will be mitigated	• Potential fish habitat effects associated with culvert replacements / extensions for road widening – dependent on nature of undertaking and agency liaison • Increased contaminant runoff volumes may be generated with widened pavement surface and will be mitigated • No net loss of fish habitat
Surface Water Quality and Quantity	• Potential minor impact on surface water quality through increased traffic demand and resulting incremental contaminant runoff from existing roads	• No direct impact to surface water quality and quantity	• No direct impact to surface water quality and quantity	• Incremental effects on surface water resources may be experienced to accommodate transit initiatives such as new stations, etc. These effects will depend on nature of improvements relative to watercourse features	• Potential impact on surface water quality through increased traffic demand and resulting incremental increase in contaminant runoff from existing roads	• Potential water quality effects through widening at existing water courses (short term impact due to construction, long term impact due to increased runoff)	• Potential water quality effects through widening at existing water courses (short term impact due to construction, long term impact due to increased runoff)
Vegetation (Wetland and Upland)	• No physical impacts to vegetation	• No physical impacts to vegetation	• No physical impacts to vegetation	• Incremental effects (such as vegetation / wetland	• Potential for physical removal of vegetation in	• Potential for physical removal where road	• Potential for physical removal where road

	ALTERNATIVES SOLUTIONS						
FACTORS	**Do Nothing**	**Limit Development**	**Travel Demand Management Measures**	**Improved Transit Service / Other Modes of Transportation**	**Intersection and/or Operational Improvements**	**Improvements to Other Roadways Beyond Planned Program**	**Improvements to Trafalgar Road**
	• Possible incremental contaminant drift with increased traffic demand – localized vegetation stress			intrusion) may occur to accommodate various transit initiatives. These effects will depend on nature and location of improvements	localized areas where improvements are made. Anticipated that these would be relatively minor	widening borders existing vegetation / wetlands or where vegetation / wetlands features extend into right-of-way • Typically results in edge effects rather than fragmentation	widening borders existing vegetation / wetlands or where vegetation / wetlands features extend into right-of-way • Typically results in edge effects rather than fragmentation • Potential for fragmentation with alternative alignments.
Wildlife	• No physical impacts to wildlife and wildlife habitats	• No physical impacts to wildlife and wildlife habitats	• No physical impacts to wildlife and wildlife habitats	• Potential for incremental habitat removal / intrusion to accommodate various transit initiatives. These effects will depend on nature and location of improvements	• Potential for physical habitat impact in localized areas where improvements are made. Anticipated that these would be relatively minor, if any	• Potential for habitat removal where road widening borders existing vegetation / wetlands or where vegetation / wetland features extend into right-of-way • Existing drainage crossing structures used by wildlife may require lengthening • Potential for reduced quality in habitat adjacent to the widened roadway (increased noise, light)	• Potential for habitat removal where road widening borders existing vegetation / wetlands or where vegetation / wetland features extend into right-of-way • Existing drainage crossing structures used by wildlife may require lengthening • Potential for reduced quality in habitat adjacent to the widened roadway (increased noise, light) • Improved passage at Black Creek and other culverts
Transportation							
Ability to Accommodate Traffic Demand	• Will not provide capacity and infrastructure required for future transportation demand on Trafalgar Road	• Trafalgar Road is operating near capacity based on existing and planned future development and there are existing delayed due to the two at grade rail crossings (CN and Metrolinx)	• Would help to reduce and optimize transportation demand • Would require significant changes to travel behavior to achieve improved levels of service	• Provides choice for mobility needs of population (reduces auto dependency); potential for reduction of traffic congestion	• Localized improvements would not be sufficient to accommodate transportation demand generated by scale of planned development	• Needs for improvements to other roads to support future transportation demand generated for planned development have been established and identified in the Halton Transportation Master Plan	• Supports transportation demand for population growth adjacent to the corridor and surrounding area
Costs							
Order of Magnitude Cost (Construction Costs)	N/A	N/A	$	$$	$$	$$$$$	$$$$$
SUMMARY	• Do Nothing would restrict future approved development and would not address future transportation needs.	• Projections of future travel demands are based on the approved future urban area as shown in the Halton Region Official Plan. Limiting development was not considered to be	• While these are part of Halton Region's overall transportation strategy, on their own they do not address the need for additional capacity on Trafalgar Road.	• The increased use of transit (such as those provided by GO Transit) is part of the overall transportation strategy and it is expected that services will be improved through planning by local transit authorities.	• They would not fully address the identified problem but are required as part of the overall improvement strategy.	• These are required as part of the overall transportation strategy in addition to improvements to the Trafalgar Road corridor and will be subject to separate studies.	• Improvements to Trafalgar Road are required in order to address future corridor requirements, and support future developments and implementation of multimodal transportation strategies.

	ALTERNATIVES SOLUTIONS						
FACTORS	**Do Nothing**	**Limit Development**	**Travel Demand Management Measures**	**Improved Transit Service / Other Modes of Transportation**	**Intersection and/or Operational Improvements**	**Improvements to Other Roadways Beyond Planned Program**	**Improvements to Trafalgar Road**
		reasonable in isolation.		Improvements to Trafalgar Road will assist in achieving and implementing Halton Region's Transportation Master Plan by providing additional lanes and infrastructure to support transit services and provide for a multi-modal corridor.			
Recommended to be Carried Forward	**NO –** for comparison purposes only	**NO –** Not consistent with Provincial *Growth Plan*	**YES –** but within the overall strategy	**YES –** but within the overall strategy	**YES –** but within the overall strategy	**NO –** however, planned improvements would be under separate studies	**YES – carried forward as the preferred alternative solution**

4.2.1 Do Nothing

This alternative involves maintaining status quo. The existing roadway would be retained in its present configuration and operational problems would continue to grow. Only planned improvements will be in place including the widening of Ninth Line, Steeles Avenue, and 10 Side Road (east of Trafalgar Road). The *Do Nothing* alternative would not address future transportation needs of Trafalgar Road and result in the escalation of congestion issues. The existing at-grade rail crossings will continue to be an operation and safety concern. While this alternative is not considered to be a reasonable alternative, it is carried forward as part of the EA process and used for comparison purposes.

4.2.2 Limit Development

Projections of future travel demands are based on the approved future urban area as shown in the Halton Region Official Plan which is in conformance with the Provincial *Growth Plan*. One of the planned growth areas in the Town of Halton Hills is Vision Georgetown, which is slated for development and will require infrastructure improvements to be completed in advance. Limiting development was not considered to be reasonable in isolation, and therefore was not carried forward for further consideration as part of this study.

4.2.3 Travel Demand Management Measures

Travel Demand Management (TDM) measures include measures to reduce the number of vehicles during the peak hours, e.g. carpooling, staggered work hours, etc. While these are part of Halton Region's overall transportation strategy, on their own, they do not address the need for additional capacity on Trafalgar Road. There is a deficiency in roadway capacity under existing conditions, and while travel demand measures may help manage the rate of growth in travel demand; however, travel demand will continue to increase with ongoing growth and development. Therefore, this alternative is carried forward for further consideration as part of the overall transportation strategy.

4.2.4 Improved Transit Services (GO Transit) / Other Modes of Transportation

Upgrades to GO Transit services on the Kitchener Line and provision of facilities for active transportation to accommodate pedestrians and cyclists are part of the overall transportation strategy but do not address the problem on their own. Widening of Trafalgar Road would assist in achieving and implementing Halton Region's Transportation Master Plan by providing additional infrastructure to support transit service provided by GO Transit and active transportation facilities. Therefore, this is carried forward for further consideration as part of the overall transportation strategy.

4.2.5 Intersection and / or Operational Improvements

Intersection improvements include the addition of traffic signals, auxiliary lanes (e.g. right turn and left turn lanes) and additional lanes through the intersection. They would not fully address the identified problem but are required as part of the overall improvement strategy. Operational improvements include modifications to signal timing plans, traffic signal interconnect systems, and road user information systems. They would not fully address the identified problem but would be considered as part of the overall improvement strategy.

4.2.6 Improvements to Other Roadways Beyond Planned Program

Widening of other Regional roadways in the immediate study area beyond planned improvements (e.g. Steeles Avenue, Ninth Line, and 10 Side Road) would not be consistent with the Halton Region Transportation Master Plan, as well as other local improvements by the Town of Halton Hills (e.g. Eighth Line). This would lead to impacts beyond the planned rights-of-way.

4.2.7 Improvements to Trafalgar Road – Recommended

Improvements to the Trafalgar Road corridor are required in order to address future corridor requirements. In the Halton Region Transportation Master Plan, Trafalgar Road was identified as requiring additional capacity and widening from 2 to 4 general traffic lanes to support future growth. Provision for active transportation and grade separations at CN and Metrolinx railways are included as part of the improvements. Therefore, this is carried forward for further consideration as part of the overall improvement strategy.

5 ALTERNATIVE DESIGN CONCEPTS

Phase 3 of the Municipal Class EA process involves the development and review of alternative design concepts. Having established the need for improvements on Trafalgar Road (**Section 2.2**) and selected a recommended planning alternative (**Section 4**), the next phase involved the development of alternative designs.

5.1 Approach to Developing Alternative Design Concepts

The following were taken into consideration for the widening of Trafalgar Road from two to four lanes between 10 Side Road and Highway 7

- Background information from previous studies and relevant planning documents (e.g. Official Plans, Transportation Master Plan, Active Transportation Master Plan);
- Integrate with ongoing, planned and completed improvements
- Lindsay Court access, including access to the long term care facility
- Impacts to adjacent properties
- Impacts to community features (e.g. Trafalgar Sports Complex, churches, and schools)
- Access to existing properties
- Cultural heritage features (e.g. cemeteries, Devereaux House, etc.)
- Natural environment features
- Provision for active transportation facilities
- Urban section (i.e. curb and gutter) vs. rural section (i.e. ditches)
- Grade separations (underpass vs. overpass) at CN and Metrolinx
- Stormwater management and fluvial geomorphology
- Construction staging and rail detour

5.1.1 Preliminary Screen of Trafalgar Road Alternatives – North of 10 Side Road to 15 Side Road

Consideration was given to widening Trafalgar Road between 10 Side Road and 15 Side Road from two to four lanes:

- Widen Trafalgar Road on existing centreline
- Widen Trafalgar Road to the east only (i.e. holding the westerly property line)
- Widen Trafalgar Road to the west only (i.e. holding the easterly property line)

There are existing agricultural land uses, as well as intermittent residential houses on both sides of Trafalgar Road between 10 Side Road and 15 Side Road. Key constraints included existing houses are in close proximity to the roadway on both sides of the road and the Mount Pleasant Cemetery.

Given these constraints, it is not considered reasonable to develop alternatives that widen to the east only, west only, or “strictly” on the existing centreline for the entire section. Based on preliminary screening of alternatives, it is proposed to widen based on a “best fit” approach (i.e. a combination to widen by the centreline, to the east or to the west) to accommodate the proposed cross sectional elements.

5.2 Design Criteria

Trafalgar Road is proposed to be widened from two to four lanes between 10 Side Road and Highway 7. The design criteria are summarized in **Table 5-1**.

Table 5-1: Preliminary Design Criteria – Trafalgar Road (North of 10 Side Road to Highway 7)

	Design Standard
Design Speed	80 km/h
Posted Speed	70 km/h rural 60 km/h urban
No. of Lanes and Width	4 lanes at 3.5 m each
Provision for Pedestrians and Cyclists	Paved shoulder (1.5 m) in rural section Bike Lane (1.8 m) in urban section Multi use path (3.0 m) Sidewalk (2.0 m)
Minimum Grade	0.5 %
Maximum Grade	6 %
Minimum Curve Radius	250 m
Minimum Stopping Sight Distance	135 m
Minimum Crest Curve	K_{crest} = 35
Minimum Sag Curve	K_{sag} = 30
Basic Right-of-Way	42 m

5.3 Grade Separation

One of the key considerations of a rail / road grade separation is whether the road will go over or under the railway tracks. The option of the rail alignment being adjusted is typically not considered because of the constraints on the rail (approximately 1% maximum grade) and the long distances and associated high costs of realignment that would be required to achieve the required clearance.

5.3.1 CN Rail Crossing

Trafalgar Road currently crosses the CN rail crossing (two tracks) at-grade north of 17 Side Road/ Maple Avenue. The exposure index warrant to consider a grade separation at this location was documented in **Section 2.2.4**.

The preliminary plans and profiles for Trafalgar Road underpass and overpass options at the CN rail tracks were developed (see correspondence to CN dated December 23, 2015 in **Appendix A**). The grade separation would require shifting the alignment of Trafalgar Road to the east in the proximity of the rail tracks to allow a suitable angle of approach to the grade separation while minimizing area impacts.

Table 5-2 provides a summary of overpass vs. underpass under various considerations.

Table 5-2: Overpass vs. Underpass at CN Rail Crossing

Consideration	Overpass	Underpass	Preferred Alternative
Road Design (Plan and Profile)	• Trafalgar Road shifted to the east (by up to approximately 60 m) to reduce skew of crossing structure • 7.15 m typical planning clearance between base of rail and structure. • Maximum road grade at 4%	• Trafalgar Road shifted to the east (by up to approximately 60 m) to reduce skew of crossing structure • 5 m typical planning clearance between rail structure and top of road. • Maximum road grade at 5%	Underpass
Property Impact	• Based on preliminary grading limits and early estimations approximately 3.75 ha property required • Requires full buy-out of four properties in the northeast quadrant of Trafalgar Road / Maple Avenue. Retaining wall required to the east at this location to minimize impacts from grading to adjacent properties and wetland feature. • Significant impacts to Club at North Halton and will require configuring the golf course. Retaining wall required to minimize impact to the golf course. • Direct impact to Devereaux House, a heritage property designated under Part IV of the Ontario Heritage Act. Retaining wall required to avoid impact to Devereaux House.	• Based on preliminary grading limits and early estimations approximately 3.1 ha property required • Requires full buy-out of four properties in the northeast quadrant of Trafalgar Road / Maple Avenue. • Some property impacts to the Club at North Halton, however reconfiguring the golf course is not anticipated. • Minimal impact to Devereaux House, a heritage property designated under Part IV of the Ontario Heritage Act.	Underpass
Access	• Due to resulting road profile, access to 17 Side Road / Maple Avenue cannot be retained. • Similarly, access to Trafalgar Sports Park will not be retained and will have to be relocated to the north where there is an existing stormwater management pond. Moving the Trafalgar Sports Park access will also require reconfiguration of the internal road connection within the Sports Park. • Adjacent property accesses	• Will be able to provide connection to 17 Side Road / Maple Avenue. • The existing access to Trafalgar Sports Park will be retained as a signalized intersection.	Underpass

Consideration	Overpass	Underpass	Preferred Alternative
	through this area will be reconfigured or closed		
Stormwater Management	• Drainage will be accommodated by gravity flow. • No pumping station is required.	• Drainage will be accommodated by gravity flow. • No pumping station is required.	Same – Underpass or Overpass
Construction Staging – Road	• Utilize existing Trafalgar Road as detour.	• Utilize existing Trafalgar Road as detour.	Same – Underpass or Overpass
Construction Staging – Rail	• Rail detour not required.	• Rail detour required.	Overpass

Based on the analysis and evaluation of the overpass vs. underpass alternatives, the **underpass alternative is considered to be preferred** as it would have less impacts to adjacent land uses, including Devereaux House, it would maintain critical connection to 17 Side Road / Maple Avenue and maintain the existing access to Trafalgar Sports Park. These are considered to be major factors for the Region, Town of Halton Hills and the local communities.

CN noted their support for the proposed underpass in a letter dated May 12, 2016, see **Appendix A**.

5.3.2 Metrolinx Rail Crossing

Trafalgar Road currently crosses the Metrolinx rail corridor (one track) at grade north of 20 Side Road. The exposure index warrant to consider a grade separation at this location was documented in **Section 2.2.4**.

The preliminary plans and profiles for Trafalgar Road underpass and overpass options at the Metrolinx rail tracks have been developed (see correspondence to Metrolinx dated December 23, 2015 in **Appendix A**). The grade separation would require shifting the alignment of Trafalgar Road to the west in the proximity of the rail tracks to allow a suitable angle of approach to the grade separation while minimizing area impacts.

Table 5-3 below provides a summary of overpass vs. underpass under various considerations.

Table 5-3: Overpass vs. Underpass at Metrolinx Rail Crossing

Consideration	Overpass	Underpass	Preferred Alternative
Road Design (Plan and Profile)	• Trafalgar Road shifted to the west (by approximately 35 m) in the proximity of the rail tracks to reduce skew of crossing structure. • 7.15 m typical planning clearance between top of	• Trafalgar Road would be shifted to the west (by approximately 35 m) to reduce skew of crossing structure. • 5 m typical planning clearance between the	Underpass

Consideration	Overpass	Underpass	Preferred Alternative
	track and structure. • Maximum road grade at 5.5%	underside of the rail structure and top of road. • Maximum road grade at 3.5%	
Property Impact	• Based on preliminary grading limits and early estimations approximately 2.6 ha property required. • Significant impacts to land uses on both sides of Trafalgar Road. Retaining walls required to minimize impacts to existing residential properties on the east side. Grading would extend into the agricultural field on the west side if retaining walls are not provided. • Greater impacts to areas designated under the Niagara Escarpment Plan (lands on the west of Trafalgar Road in the proximity of the Metrolinx crossing). • Require full buy-out of three properties in the southwest quadrant of Trafalgar Road / 20 Side Road (two if retaining wall built on the west side)	• Based on preliminary grading limits and early estimations approximately 1.9 ha property required. • Require full buy-out of two properties in the southwest quadrant of Trafalgar Road / 20 Side Road. • Some property impacts along the easterly property line of the land in the southwest quadrant of Trafalgar Road and Highway 7. • Relatively less impacts to areas designated under the Niagara Escarpment Plan (lands on the west of Trafalgar Road in the proximity of the Metrolinx crossing).	Underpass
Access	• Due to resulting road profile, access to 20 Side Road would require significant realignment. • Intersection to Highway 7 will have to be relocated.	• Will be able to provide connection to 20 Side Road. • Intersection with Highway 7 would remain at the same location.	Underpass
Stormwater Management	• Drainage will be accommodated by gravity flow. • No pumping station is required.	• Drainage will be accommodated by gravity flow. • No pumping station is required.	Same – Underpass or Overpass
Construction Staging – Road	• Utilize existing Trafalgar Road as detour.	• Utilize existing Trafalgar Road as detour.	Same – Underpass or Overpass
Construction Staging – Rail	• Rail detour not required.	• Rail detour required.	Overpass

Based on the analysis and evaluation of the overpass vs. underpass alternatives, the **underpass alternative is considered to be preferred** as it would have less impacts to adjacent land uses, including areas designated under the Niagara Escarpment Plan, it

would allow connection to 20 Side Road, and maintain the existing intersection location at Highway 7. These are considered to be major factors for the Region, MTO, Town of Halton Hills, NEC and the local community.

Metrolinx noted their support for the proposed underpass in a letter dated January 18, 2016, see **Appendix A**.

5.4 Description of Alternative Design Concepts – 15 Side Road to Highway 7

There are a number of constraints through this section of Trafalgar Road, including:

Socio-Economic Environment:

- Stewarttown Community – proximity of residential houses
- Club at North Halton Golf and Country Club
- Community features –Trafalgar Sport Complex and schools
- Accesses to adjacent properties
- New subdivision east of Sixth Line
- Proposed developments
- Existing subdivision north of Princess Anne Drive
- Agricultural land uses

Cultural Environment

- Devereaux House – Designated under Part IV of the Ontario Heritage Act
- Devereaux Cemetery
- St. John Cemetery

Natural Environment

- Black Creek Crossing
- Hungry Hollow ESA
- Designated Greenbelt Plan Area
- Designated Niagara Escarpment Plan area

Geometric

- Two at-grade rail crossings (CN and Metrolinx)
- Connection to existing crossing roads (15 Side Road, 17 Side Road, 20 Side Road and Highway 7)

5.4.1 Conceptual Corridors

Given the many constraints within the study area, three conceptual corridors were proposed as shown in **Exhibits 5-1 to 5-3**. The Conceptual Corridor Options were presented at Public Information Centre 1 on November 20, 2014, see **Section 6.1.3.1.**

- **Conceptual Corridor 1**: This option considers the roadway improvements along the existing Trafalgar Road corridor. The crossing at Black Creek will be widened. The roadway will be grade separated at the CN Rail crossing (underpass) and Metrolinx Rail crossing (underpass).
- **Conceptual Corridor 2**: Bypasses Stewarttown to the west (about mid-concession) from south of 15 Side Road to Highway 7. The roadway would connect to Highway 7 at the current intersection location. Under this option, the railway crossings along the existing Trafalgar Road alignment will remain at-grade while the grade separations will be provided for the realignment.

CONCEPTUAL CORRIDOR - OPTION 1
Widen along Existing Trafalgar Road - South of 15 Side Road to Highway 7

Legend

- Farm
- Educational Institution
- Historical Building
- Church
- Cemetery
- Signalized Intersection
- Rail Line
- Existing At-Grade Crossing
- Potential Grade Separation
- Contours (0.5 m)
- Roads / Highways
- Existing Cycling Facilities
- Proposed Cycling Facilities
- Intermittent
- Permanent
- Study Area
- Property Line
- Potential Local Connection
- Municipal Boundary
- CH/CVC Boundary
- Pit Quarry
- Golf Course
- Vision Georgetown Study
- Greenbelt Limits
- Niagara Escarpment Boundary
- Potential Corridor
- Rural Cluster
- Hamlet Boundary
- Wetlands Identified
- Regional Wetlands
- Provincial Wetlands
- Recreation
- Wooded Area
- Water Body

Land Use

- Agricultural Rural Area
- Hamlet
- Mineral Resource Extraction Area
- Natural Heritage System
- Urban Area
- Future Development

N

SIXTH LINE

10 SIDE ROAD

15 SIDE ROAD

CNR

17 SIDE ROAD

20 SIDE ROAD

Future Development

TOWN OF HALTON HILLS

Connection to 10 Side Road

Ashgrove

TRAFALGAR ROAD

Connection to 15 Side Road

Stewarttown

Connection to 17 Side Road

Trafalgar Sports Park

TRAFALGAR ROAD

Connection to 20 Side Road

Potential Grade Separation

Potential Grade Separation

MAPLE AVENUE

Georgetown

Metrolinx GO Transit - Kitchener Line

HWY. 7

Not to Scale

Halton

MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Conceptual Corridor Option 1 (Along Existing Trafalgar Road)

Exhibit

5-1

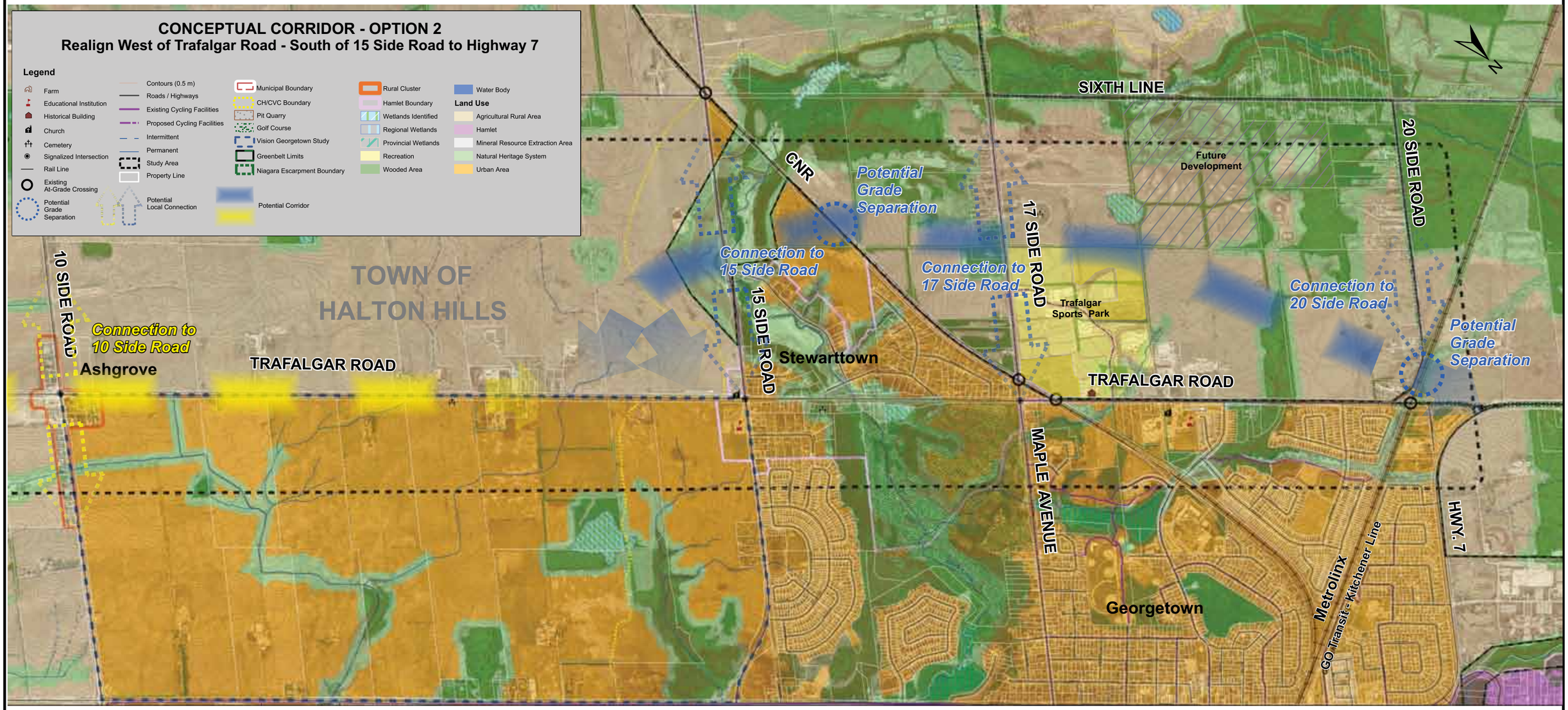
CONCEPTUAL CORRIDOR - OPTION 2
Realign West of Trafalgar Road - South of 15 Side Road to Highway 7

Legend

- Farm
- Educational Institution
- Historical Building
- Church
- Cemetery
- Signalized Intersection
- Rail Line
- Existing At-Grade Crossing
- Potential Grade Separation
- Contours (0.5 m)
- Roads / Highways
- Existing Cycling Facilities
- Proposed Cycling Facilities
- Intermittent
- Permanent
- Study Area
- Property Line
- Potential Local Connection
- Municipal Boundary
- CH/CVC Boundary
- Pit Quarry
- Golf Course
- Vision Georgetown Study
- Greenbelt Limits
- Niagara Escarpment Boundary
- Potential Corridor
- Rural Cluster
- Hamlet Boundary
- Wetlands Identified
- Regional Wetlands
- Provincial Wetlands
- Recreation
- Wooded Area
- Water Body

Land Use

- Agricultural Rural Area
- Hamlet
- Mineral Resource Extraction Area
- Natural Heritage System
- Urban Area



Not to Scale

Halton | MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Conceptual Corridor Option 2 (Bypass)

Exhibit **5-2**

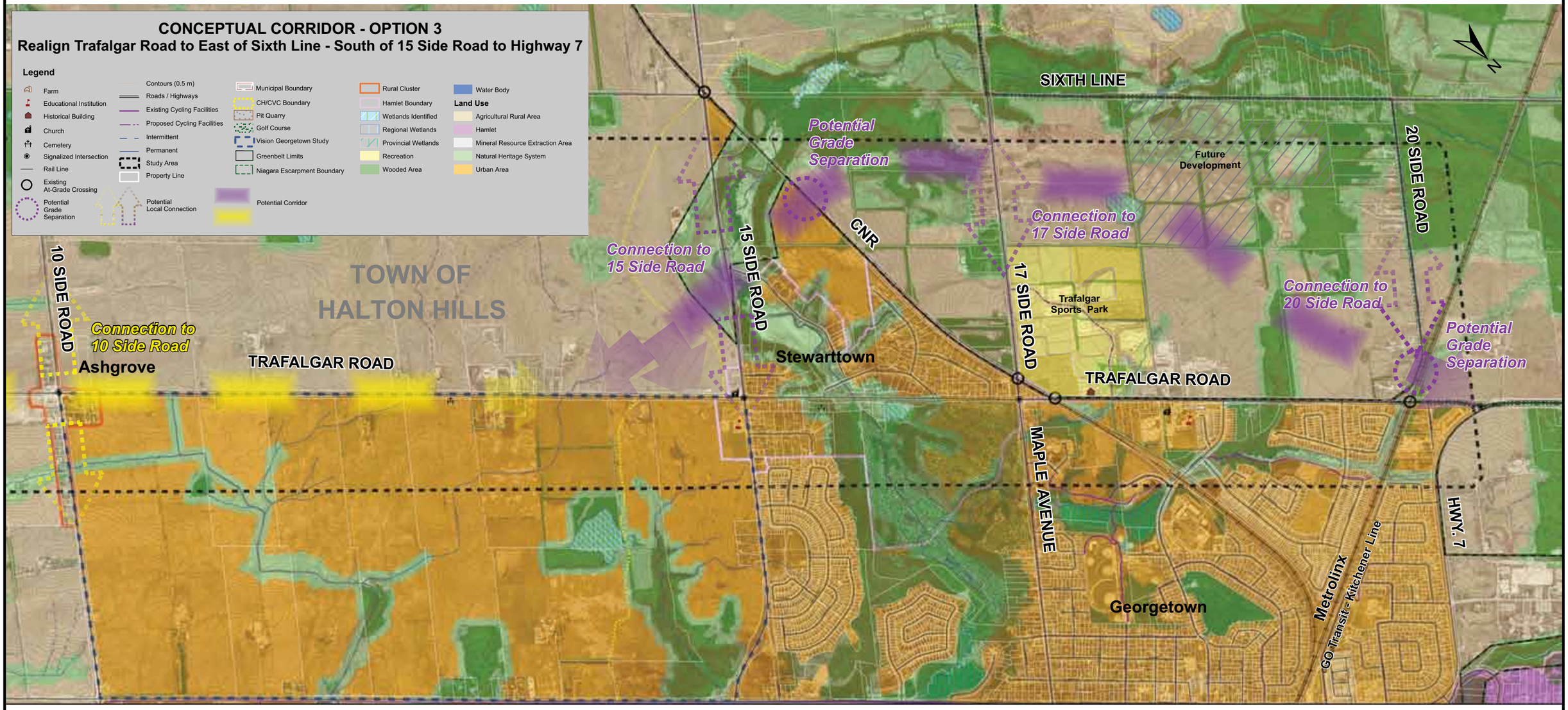
CONCEPTUAL CORRIDOR - OPTION 3
Realign Trafalgar Road to East of Sixth Line - South of 15 Side Road to Highway 7

Legend

- Farm
- Educational Institution
- Historical Building
- Church
- Cemetery
- Signalized Intersection
- Rail Line
- Existing At-Grade Crossing
- Potential Grade Separation
- Contours (0.5 m)
- Roads / Highways
- Existing Cycling Facilities
- Proposed Cycling Facilities
- Intermittent
- Permanent
- Study Area
- Property Line
- Potential Local Connection
- Municipal Boundary
- CH/CVC Boundary
- Pit Quarry
- Golf Course
- Vision Georgetown Study
- Greenbelt Limits
- Niagara Escarpment Boundary
- Potential Corridor
- Rural Cluster
- Hamlet Boundary
- Wetlands Identified
- Regional Wetlands
- Provincial Wetlands
- Recreation
- Wooded Area
- Water Body

Land Use

- Agricultural Rural Area
- Hamlet
- Mineral Resource Extraction Area
- Natural Heritage System
- Urban Area



Not to Scale

Halton | MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Conceptual Corridor Option 3 (Bypass)

Exhibit **5-3**

- **Conceptual Corridor 3**: This is the most westerly of the three options and bypasses Stewarttown from south of 15 Side Road to Highway 7. The roadway would connect to Highway 7 at the current intersection location. Under this option, the railway crossings along the existing Trafalgar Road alignment will remain at-grade while the grade separations will be provided for the realignment.

5.4.2 Design Alternatives

Preliminary plans were developed within the Conceptual corridors. Altogether, five alignment alternatives were developed for the improvements to Trafalgar Road between 15 Side Road and Highway 7, namely, Alternatives 1A, 1B, 1C, 2 and 3.

Alternatives 1A, 1B, and 1C are along the existing alignment, while Alternatives 2 and 3 bypass Stewarttown to the west of Trafalgar Road. Overviews of these alternatives are documented in the following sub-sections. See **Exhibits 5-4 to 5-9**.

5.4.2.1 Alternatives 1A, 1B and 1C

The three alternatives under Alternative 1 (namely, Alternatives 1A, 1B and 1C) consider roadway improvements along the existing Trafalgar Road corridor.

The area between 15 Side Road and Stewarttown Road South was the most constrained area through the corridor and was initially shown as a “focused area for additional review” during the EA process.

Grade separations at the CN and Metrolinx Rail crossings on Trafalgar Road are proposed. Alternatives 1A, 1B, and 1C follow the same alignment north of the CN Rail crossing as shown in **Exhibit 5-7**, with the key distinguishing characteristics of the three sub-alternatives as follows.

Alternative 1A

Trafalgar Road would be widened from two to four lanes with the addition of on-road bike lanes, as well as a multi-use path on the east side and a sidewalk on the west side. It is proposed that the profile of Trafalgar Road would be raised to eliminate potential flooding conditions at Black Creek during Regional storm events, as well as to address the existing steep grade through the Black Creek valley. As a result, Stewarttown Road South would become a cul-de-sac due to the grade difference between Stewarttown Road South and the new Trafalgar Road. Stewarttown Road North would become a signalized intersection.

From approximately 300 m south of 17 Side Road/Maple Avenue, the alignment of Trafalgar Road would shift to the east and cross under CN rail via an underpass and the alignment would reconnect Trafalgar Road at the access to the Trafalgar Sports Complex (i.e. immediately north of Devereaux House). From the access to the Trafalgar Sports Complex northerly, Trafalgar Road would generally be widened to the west since there are existing residential land uses on the east side.

Scale 1:2000

Halton | MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Alternative 1A
15 Side Road to North of Entrance of Trafalgar Sports Complex

Exhibit
5-4

Scale 1:2000

Halton Region | MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Alternative 1B
15 Side Road to North of Entrance of Trafalgar Sports Complex

Exhibit
5-5

Scale 1:2000

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TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Alternative 1C
15 Side Road to North of Entrance of Trafalgar Sports Complex

Exhibit 5-6

Scale 1:2000

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TRAFALGAR ROAD CLASS EA STUDY (Section 2)
North of 10 Side Road to Highway 7

Alternatives 1A, 1B and 1C
North of Entrance of Trafalgar Sports Complex to Highway 7

Exhibit
5-7


Halton
MMM GROUP
TRAFALGAR ROAD CLASS EA STUDY (NORTH)
North of 10 Side Road to Highway 7
Alternative 2
15 Side Road to Highway 7
Exhibit
5-8
Scale 1:2000
Sixth Line
15 Side Road
17 Side Road
20 Side Road
ESTATES OF BLACK CREEK
(Residential Subdivision
Under Construction)
Alternative 2
POTENTIAL NEW STRUCTURES
CN
Mill Pond Drive
Black
Creek
Metrolinx
GO Transit - Kitchener Line
Trafalgar Road (Regional Road 3)
Trafalgar Road (Regional Road 3)
CLOSED
Highway 7

Halton Region | MMM GROUP

TRAFALGAR ROAD CLASS EA STUDY (NORTH)
North of 10 Side Road to Highway 7

Alternative 3
15 Side Road to Highway 7

Exhibit
5-9

North of Berton Boulevard, Trafalgar Road would shift to the west and cross under the Metrolinx rail north of 20 Side Road via an underpass and would tie into Highway 7 at the current intersection location. 20 Side Road would be realigned as it approaches the new alignment of Trafalgar Road.

Alternative 1B

Similar to Alternative 1A, Trafalgar Road would be widened from two to four lanes with the addition of on-road bike lanes, as well as a multi-use path on the east side and a sidewalk on the west side. It is proposed that the profile of Trafalgar Road would be raised to eliminate potential flooding conditions at Black Creek during Regional storm events, as well as to address the existing steep grades through the Black Creek valley. As a result, Stewarttown Road South would become a cul-de-sac due to the grade difference between Stewarttown Road South and the new Trafalgar Road. Stewarttown Road North would become a signalized intersection.

The key difference between Alternative 1B and Alternatives 1A and 1C is that from approximately 300 m south of 17 Side Road, the alignment of Trafalgar Road under Alternative 1B would shift to the east slightly and then curve to the west to cross under CN rail via an underpass (versus crossing CN to the east, as with Alternatives 1A and 1C. For approximately 300 m north of 17 Side Road/Maple Avenue, the realigned Trafalgar Road would be located within the Trafalgar Sports Complex. The roadway would follow the existing alignment of Trafalgar Road again at the access to the Trafalgar Sports Complex (i.e. immediately north of Devereaux House). The roadway would be closer to Devereaux House under this alternative. From the access to the Trafalgar Sports Complex northerly, Trafalgar Road would generally be widened to the west since there are existing residential land uses on the east side.

Under this alternative, 17 Side Road will have to be realigned, also within the Trafalgar Sports Complex, to provide a new connection between 17 Side Road and Trafalgar Road.

North of Berton Boulevard, Trafalgar Road would shift to the west and cross under the Metrolinx rail north of 20 Side Road via an underpass and would tie into Highway 7 at the current intersection location. 20 Side Road would be realigned as it approaches the new alignment of Trafalgar Road.

Alternative 1C

Similar to Alternative 1A, Trafalgar Road would be widened from two to four lanes with the addition of on-road bike lanes, as well as a multi-use path on the east side and a sidewalk on the west side. It is proposed that the profile of Trafalgar Road would be raised to eliminate potential flooding conditions at Black Creek during Regional storm events, as well as to address the existing steep grades through the Black Creek valley. As a result, Stewarttown Road South would become a cul-de-sac due to the grade difference between Stewarttown Road South and the new Trafalgar Road. Under this alternative, Stewarttown Road North would become a right-in/right-out intersection at Trafalgar Road and it would also extend northerly to connect to 17 Side Road; this portion of Stewarttown Road North would function like a “service road” parallel to Trafalgar Road.

From approximately 500 m south of 17 Side Road, the alignment of Trafalgar Road would shift to the east and cross under CN rail via an underpass and the alignment would reconnect Trafalgar Road at the access to the Trafalgar Sports Complex (i.e. immediately north of Devereaux House). This alternative would intrude further into the property at the Club at North Halton by approximately an additional 20 m compared to Alternative 1A. From the access to the Trafalgar Sports Complex northerly, Trafalgar Road would generally be widened to the west since there are existing residential land uses on the east side.

North of Berton Boulevard, Trafalgar Road would shift to the west and cross under the Metrolinx rail north of 20 Side Road via an underpass and would tie into Highway 7 at the current intersection location. 20 Side Road would be realigned as it approaches the new alignment of Trafalgar Road.

Lindsay Court

As noted above, Alternatives 1A, 1B, and 1C follow the same alignment north of the CN Rail crossing as shown in **Exhibit 5-7**. It should be noted that the sight line at the existing Lindsay Court / Trafalgar Road intersection requires improvements and that the existing access from the long term care facility at Trafalgar Road / Highway 7 to Highway 7 was intended to be temporary only until such time when the Lindsay Court / Trafalgar Road intersection is reconstructed. The access from Lindsay Court was initially shown to be connected to Highway 7 (per **Exhibit 5-7**); however, this was subsequently updated per consultation with MTO (see **Section 6.2.9**). The preliminary plan of the preferred alternative shown in Chapter 7 reflects the reconstructed intersection of Lindsay Court / Trafalgar Road.

5.4.2.2 Alternative 2

This alternative would bypass Stewarttown to the west (about mid-concession) from south of 15 Side Road to Highway 7. Trafalgar Road would swing to the west from approximately 800 m south of 15 Side Road and would cross 15 Side Road approximately 650 m west of the existing Trafalgar Road / 15 Side Road intersection. Just south of the new 15 Side Road intersection, there would be a new crossing of Black Creek. From 15 Side Road, the roadway would continue northerly to cross the CN rail as an underpass and then continue northerly to connect with 17 Side Road (approximately 710 m west of the existing Trafalgar Road / 17 Side Road intersection). This portion of new Trafalgar Road between 15 Side Road and 17 Side Road would be within the Stewarttown Woods ESA, including woodlot and wetland features.

The new 17 Side Road intersection would be located between Trafalgar Sports Complex and Devereaux Cemetery. From 17 Side Road, the alignment would continue northerly through the west-end of Trafalgar Sports Park (east of Devereaux Cemetery). From the northern property limits of Trafalgar Sports Park, the alignment would then head northeast, crossing diagonally through agricultural lands towards the existing Highway 7 / Trafalgar Road intersection location. The alignment would cross 20 Side Road and the Metrolinx rail line via an underpass. Under this alternative, the railway crossings along the existing Trafalgar Road alignment would remain at-grade.

20 Side Road would be realigned and Lindsay Court would be extended as it approaches the new alignment of Trafalgar Road.

5.4.2.3 Alternative 3

This alternative is the most westerly of the alternatives and would bypass Stewarttown from south of 15 Side Road to Highway 7. Trafalgar Road would swing to the west from approximately 800 m south of 15 Side Road and would cross 15 Side Road approximately 750 m west of the existing Trafalgar Road / 15 Side Road intersection. Just north of the new 15 Side Road intersection, there would be a new crossing of Black Creek. A long span structure would possibly be required to span the valley of Black Creek. From 15 Side Road, the roadway would continue northerly to cross the CN rail as an underpass and then continue northerly to connect with 17 Side Road (approximately 1 km m west of the existing Trafalgar Road / 17 Side Road intersection). This portion of new Trafalgar Road between 15 Side Road and 17 Side Road would be within the Stewarttown Woods ESA, including woodlot and wetland features.

The new 17 Side Road intersection would be located to the west of Devereaux Cemetery.

The alignment would continue north to the west of Devereaux Cemetery, crossing diagonally through the undisturbed north end of the cemetery and continuing northeast through agricultural lands towards the existing Highway 7 / Trafalgar Road intersection location. The alignment would cross 20 Side Road and the Metrolinx rail line via an underpass. Under this alternative, the railway crossings along the existing Trafalgar Road alignment will remain at-grade.

20 Side Road would be realigned and Lindsay Court would be extended as it approaches the new alignment of Trafalgar Road.

5.5 Analysis and Evaluation of Alternative Designs

The analysis and evaluation for the improvements to the Trafalgar Road corridor is based on a set of analysis criteria. The analysis criteria are divided into five major groupings:

Table 5-4: Factors for Analysis and Evaluation

GROUPING	FACTORS
Socio-Economic Environment	Community and Property Effects Provision for Pedestrians Provision for Cyclists Land Use Compatibility Noise and Air Quality Illumination
Cultural Environment	Built Heritage Resources Archaeology Resources
Natural Environment	Policy Areas Vegetation Wildlife Fisheries and Aquatic Habitat

GROUPING	FACTORS
	Surface Water Quality and Quantity
Transportation	Traffic Operations (Future Conditions 2031) Intersection Requirements Geometrics Standards Rail Operations Network Compatibility Utilities
Preliminary Cost Estimate	Capital Cost Constructability and Construction Staging Maintenance Cost

5.5.1 Description of Groupings and Factors

Socio-Economic Environment – This grouping addresses effects of the alternatives on the existing properties. It also assesses whether the alternatives support the future land use of the adjacent properties. The factors within the grouping are defined as follows:

- ***Community and Property Effects*** – Identifies impacts to residential areas, impacts to farm and business operations, impacts to institutional and recreational uses, as a result of the proposed alternatives.
- ***Access***– Identifies how access to properties will be impacted as a result of the proposed alternatives due to horizontal and vertical profile changes, median conditions, etc.
- ***Provision for Pedestrians*** – Identifies opportunities to accommodate pedestrian facilities.
- ***Provision for Cyclists*** – Identifies opportunities to accommodate cyclist facilities.
- ***Land Use Compatibility*** – Identifies compatibility of the proposed alternatives to existing and future land use
- ***Noise and Air Quality*** – Identifies impacts to noise and air quality
- ***Illumination*** – Identifies opportunities for illumination

Cultural Environment – This grouping addresses effects of the alternatives on the historical and archaeological components of the environment. This grouping is a measure of the cultural effects on community features. The factors within the grouping are defined as follows:

- ***Built Heritage*** – Identifies impact to built heritage resources in the study area.
- ***Archaeology*** – Identifies impact to archaeological resources in the study area.

Natural Environment – This grouping addresses effects of the alternative on the natural environmental features. The factors within the grouping are defined as follows:

- ***Policy Areas*** – Identifies impacts to designated natural environmental features / areas (e.g. Greenbelt Plan areas, Niagara Escarpment Plan areas, Environmentally Sensitive Areas, Endangered Species habitats, etc.)
- ***Vegetation*** – Identifies impacts to vegetation, considering sensitivity, quality and significance of vegetation (including provincially or regionally rare / uncommon plant species) and relative magnitude of potential effect
- ***Wildlife*** – Identifies impact to the wildlife in the study area, including impacts to species of conservation concern (federally and provincially and TRCA species of

conservation concern), impacts on habitats and impacts to wildlife movement opportunities
- ***Fisheries and Aquatic Habitat*** – Identifies the effects of the alternatives to fish and fish habitat considering sensitivity and relative magnitude of potential effect
- ***Surface Water Quality and Quantity*** – Identifies potential to affect surface and ground water quality in adjacent areas

Transportation – This grouping identifies the extent to which an alternative can provide reasonable transportation services. The factors within the grouping are defined as follows:

- ***Traffic Operations (Future Conditions 2031)*** – Identifies ability to accommodate future travel demand
- ***Road Safety*** – Consideration of road safety, such as road grade through Black Creek valley, traffic at intersections, and rail crossing safety
- ***Intersection Requirements*** – Identifies removal or addition of intersections and opportunities for intersection improvements
- ***Geometric Standards*** – Identifies the geometric features, which include design speed minimum radius, maximum grade, etc.
- ***Rail Operations*** – Identifies number of crossings: grade separated and/or at-grade
- ***Network Compatibility*** – Identifies how the alternative would meet the transportation needs as part of the existing and future road network
- ***Utilities*** – Identifies utilities relocation requirements

Preliminary Cost Estimate – This grouping identifies the order of magnitude cost required to build the alternative.

- ***Capital Cost*** – Consideration of cost for each alternative in terms of order of magnitude
- ***Constructability and Construction Staging*** - Consideration of staging and detour requirements, as well as geotechnical and foundation conditions
- ***Maintenance Cost*** – Consideration of total amount of infrastructure to be maintained post construction

The detailed analysis and evaluation table can be found in **Appendix H**.

5.5.2 Analysis and Evaluation of Alternatives– Widening Along Existing Trafalgar Road vs. Bypass Options

5.5.2.1 Socio-Economic Environment

The trade-offs amongst Alternative 1 (1A, 1B, 1C, i.e. along the existing corridor) and Alternatives 2 and 3 (bypass alternatives) are largely related to impacts to existing land uses vs. agricultural and rural lands. Alternative 1 (1A, 1B, 1C) would have less absolute area of property required compared to Alternatives 2 and 3 but would result in a greater number of direct property impacts compared to Alternative 2 and 3. Alternative 1 would also require some property along the westerly property limit from the Stewarttown Public School. In addition, the shift in the alignment of Trafalgar Road to the east in the area of 17 Side Road / Maple Avenue would include impacts the Club at

North Halton. Under Alternatives 2 and 3, about four to six large agricultural parcels would be severed and would impact farming potential and operations.

There would be direct impacts to property accesses under Alternative 1 (1A, 1B and 1C), most are related to reducing the length / vertically connecting the driveways, which can largely be mitigated. While Alternatives 2 and 3 would not have any direct impacts to accesses along the existing Trafalgar Road corridor, much of the agricultural lands would be severed and the new Trafalgar Road alignment would create a barrier for farming operations, requiring mitigation if possible.

Alternatives 2 and 3 are not considered as compatible to existing and future land uses compared to Alternative 1 (1A, 1B, 1C). Alternatives 2 and 3 (i.e. bypass alignments) would sever viable agricultural lands, and would be located away from the Georgetown and Stewarttown communities and businesses where additional transportation capacity, active transportation facilities, as well as where railway grade separations are currently required. In addition, Alternatives 2, (particularly), and 3 (less so) would directly impact the Trafalgar Sports Park and Devereaux Cemetery.

5.5.2.2 Cultural Environment

Devereaux House is the only feature designated under Part IV of the Ontario Heritage Act within the study area. From a built heritage perspective, none of the alternatives would directly impact Devereaux House; although Alternative 1B would encroach on some of the open / landscaped areas associated with the property, making it less desirable. There are other indirect impacts to cultural heritage landscapes associated with each alternative but none are designated features.

St. John's Anglican Church located in the southeast quadrant of Trafalgar Road / 15 Side Road would not be directly impacted under any of alternatives.

The St. John Cemetery is located approximately 300 m north of 15 Side Road. The cemetery is not visible from Trafalgar Road as it is situated on a hill on the east side of the existing retaining wall south of Black Creek (i.e. top of slope beyond the retaining wall). Under Alternative 1, the existing wall will have to be reconstructed to accommodate the road widening. The reconstructed wall will be located within the Region's right-of-way. No property will be required from the Cemetery.

From an archaeological perspective, Alternatives 2 and 3 would be located in undisturbed areas (greenfield construction) and a Stage 2 archaeological assessment would be required. There may be potential for archaeology finds particularly in areas close to the creek crossings. Much of the right-of-way along existing Trafalgar Road under Alternative 1 (1A, 1B, and 1C) was previously disturbed and would have less archaeological potential compared to Alternatives 2 and 3.

5.5.2.3 Natural Environment

From a natural environment perspective, Alternatives 2 and 3 (i.e. bypass alternatives) are significantly inferior compared to Alternative 1 (1A, 1B, 1C) as both bypass alternatives would sever important natural environment features such as the Stewarttown Woods ESA, the Black Creek Valley and a number of woodlots.

Alternatives 2 and 3 would also introduce new crossings of Black Creek, as well as the need to potentially replace the existing Black Creek crossings on 15 Side Road.

Natural environment impacts associated with Alternative 1 (1A, 1B, 1C) are largely related to encroachment along the existing right-of-way. Alternative 1B is slightly less preferred as it would impact potential bobolink and eastern meadowlark habitats north of 17 Side Road (west of Trafalgar Road); listed as provincially threatened species under the Endangered Species Act. Alternatives 2 and 3 would impact the potential bobolink and eastern meadowlark habitats south of Highway 7. Alternative 1 (1A, 1B, 1C) may also impact the same potential habitats south of Highway 7 depending on the access treatment at Lindsay Court.

5.5.2.4 Transportation

From a transportation perspective, all alternatives would provide additional suitable north-south capacity to support inter regional traffic. However, the location of Alternatives 2 and 3 (i.e. bypass alternatives) would be located much further west of Georgetown and Stewarttown, therefore, not able to support the local transportation needs. In addition, the existing at grade crossings (CN and Metrolinx) on Trafalgar Road would remain at grade under Alternatives 2 and 3 and therefore, would continue to cause delay, especially with the potential for increased train frequency in the future (e.g. all-day two-way service as proposed by Metrolinx in The Big Move). Emergency vehicles destined to Georgetown and Stewarttown properties would still have to rely on existing Trafalgar Road; the existing at grade crossings may lead to potential delay in response time or detours.

Amongst Alternatives 1A, 1B, and 1C, Alternative 1B is less preferred as it would require the realignment of 17 Side Road and converting a portion of the access within Trafalgar Sports Park into a minor arterial road. Alternative 1C would be more preferred compared to Alternative 1A, as Alternative 1C would provide a “service road” concept for those on Stewarttown Road and also residents (south of 17 Side Road) who currently have direct access to Trafalgar Road. This would reduce the number of direct accesses to Trafalgar Road, and would be more desirable in terms of the overall operation of the corridor.

5.5.2.5 Cost and Construction Staging

From a cost and construction perspective, Alternatives 1A, 1B, and 1C are moderately preferred over Alternatives 2 and 3 as the latter would be higher in terms of ongoing infrastructure maintenance required (i.e. the need to maintain two facilities). While Alternatives 1A, 1B, and 1C would have high staging costs related to lane closures and the construction of Black Creek crossing improvements, Alternatives 2 and 3 would require the construction of a new crossing structure at Black Creek, as well as the replacement of the two crossing along 15 Side Road in proximity of the new alignment.

In terms of construction staging, Alternatives 2 and 3 would be relatively less complicated compared to Alternative 1 (1A, 1B, 1C) as construction would all be done in “greenfield” conditions; however, construction through greenfield areas would be more disruptive to the local rural setting.

From a geotechnical perspective, high level review indicated that replacement of the Black Creek crossing along existing Trafalgar Road (i.e. Alternative 1 – 1A, 1B and 1C)

due to widening and flood reduction requirements is preferred over constructing a new crossing of Black Creek under a new alignment (i.e. Alternatives 2 and 3). Overall geotechnical conditions anticipated along the alternative alignments are generally similar and are not expected to have a significant influence on the selection of the preferred alignment, with the possible exception of the Black Creek crossing.

5.5.2.6 Summary

The analysis and evaluation of alternatives was presented at Public Information Centre 2 on June 17, 2015, see **Section 6.1.3.2**.

Overall, Alternatives 1A, 1B and 1C were considered to be more preferred compared to Alternatives 2 and 3.

While Alternatives 1A, 1B and 1C would result in direct impact to a number of adjacent properties, there would be less impact to the agricultural lands in the areas.

Alternatives 1A, 1B and 1C would have significantly less impact to the natural environment including several sensitive environmental features such as Black Creek, the Niagara Escarpment and the Greenbelt.

Alternatives 2 and 3 would alter the cultural heritage landscape by introducing a new road though greenfield, undisturbed areas, as well as Devereaux Cemetery.

All alternatives would support the existing and future transportation demand; however, Alternatives 2 and 3 would be located much further away from the Georgetown community and planned growth area.

Alternatives 2 and 3 would be relatively less complicated to stage in comparison to Alternatives 1A, 1B and 1C; however, would have greater challenges with construction access through natural features.

Table 5-5 summarizes the rankings of the alternatives amongst the factor groups.

Table 5-5: Summary of Analysis and Evaluation of Alternatives

Factor	ALTERNATIVE 1A	ALTERNATIVE 1B	ALTERNATIVE 1C	ALTERNATIVE 2	ALTERNATIVE 3
Socio-Economic Environment	Moderately Preferred	Moderately Preferred	Moderately Preferred	Less Preferred	Less Preferred
Cultural Environment	More Preferred	Moderately Preferred	More Preferred	Less Preferred	Less Preferred
Natural Environment	More Preferred	More Preferred	More Preferred	Less Preferred	Least Preferred
Transportation	Moderately Preferred	Moderately Preferred	Moderately Preferred	Moderately Preferred	Moderately Preferred
Cost and Construction	Moderately Preferred	Moderately Preferred	Moderately Preferred	Less Preferred	Less Preferred
Overall Preference	Moderately to More Preferred			Less Preferred	Least Preferred

5.5.3 Analysis of Alternatives – Alternatives 1A, 1B and 1C

Based on the analysis and evaluation documented in **Section 5.5.2**, Alternatives 1A, 1B and 1C were considered to be preferred over Alternatives 2 and 3 (bypass options).

As noted in **Section 5.4.2.1**, between 15 Side Road and north of the CN Rail crossing, three alignment alternatives were explored and presented to the public at Public Information Centre 2 on June 17, 2015.

Alternatives 1A, 1B and 1C had varying social and natural environment impacts; therefore, additional review, as well as meetings with affected stakeholders were carried out following Public Information Centre 2 to identify a preferred alternative amongst the three.

5.5.3.1 Socio-Economic Environment

Amongst Alternatives 1A, 1B and 1C, the potential impacts associated with each alternative are very similar, except for the property requirement in the proximity of 17 Side Road / Maple Avenue. Alternative 1B is not preferred as it would directly impact the Trafalgar Sports Complex and would also require the reconstruction of the stormwater management pond, as well as a new minor arterial within Trafalgar Sports Park. Alternative 1C would have greater property impact to the North Halton Golf and Country Club, and therefore, not preferred.

5.5.3.2 Cultural Environment

Devereaux House is the only property within the study area designated under Part IV of the Ontario Heritage Act.

Alternative 1B would be less preferred compared to Alternatives 1A and 1C as it would impact the front lawn area of the Devereaux House property and would be located closer to the Deveraux House compared to Alternatives 1A and 1C. Alternative 1B would also require the realignment of 17 Side Road, and would change the landscape surrounding Devereaux House.

5.5.3.3 Natural Environment

A new crossing over Black Creek would be required under all alternatives, including a rise in the road profile to avoid over topping of the road under Regional storm events. All alternatives are considered to be equally ranked under potential impacts to natural environment.

5.5.3.4 Transportation

All three alternatives would provide additional north-south capacity on Trafalgar Road. However, Alternative 1B is less preferred as it would require the realignment of 17 Side Road through Trafalgar Sports Complex.

5.5.3.5 Cost and Construction Staging

Alternative 1B would likely cost more compared to Alternatives 1A and 1C as it would require the realignment of 17 Side Road and the reconstruction of the stormwater

management pond in Trafalgar Sports Complex. The construction staging of Alternative 1B would also be relatively more complex compared to Alternatives 1A and 1C as the CN rail detour would be complicated in combination with the construction of the 17 Side Road realignment.

As noted in **Section 5.5.3.1**, Alternative 1C would have greater property impact to the North Halton Golf and Country Club; therefore, it is expected that the corresponding property and mitigation costs would be higher than Alternatives 1A and 1B.

5.6 Selection of Technically Preferred Alternative

In summary, **Alternative 1A has been identified as the Technically Preferred Alternative** as it would avoid impacts to Trafalgar Sports Complex, minimize impacts to Devereaux House property, limits impact to the Club at North Halton and would have suitable construction staging and geometric design. This is considered to be the best balanced alternative amongst factors in socio-economic environment, cultural environment, natural environment, transportation, as well as cost and construction.

Following the selection of Alternative 1A as the preferred alternative, refinements were made to the alignment specifically in the area through Stewarttown (i.e. between 15 Side Road and Black Creek) as that is the most constrained section through the study corridor with residential properties in close proximity to the roadway, as well as natural features (e.g. Black Creek) and heritage features (e.g. St. John's Anglican Church).

Between 15 Side Road and Black Creek, considerations were given to widening Trafalgar Road to the west only (i.e. holding the easterly Trafalgar Road right-of-way) vs. widening to the east only (i.e. holding the westerly Trafalgar Road right-of-way). These options were reviewed based on factors in socio-economic, cultural environment, natural environment and constructability.

From the socio-economic perspective, both options would result in direct impact to multiple properties adjacent to Trafalgar Road.

From a cultural heritage perspective, St. John's Anglican Church (located in the southwest quadrant of Trafalgar Road and 15 Side Road) would be directly impacted under the option that widen to the west only. While the Church is not designated under Part IV of the Ontario Heritage Act, it is listed as a cultural heritage property under the Town of Halton Hills inventory. Access to St. John's cemetery (east side at Black Creek) would also be impacted under both options.

The widening of Trafalgar Road will require a new crossing of Black Creek. From a constructability perspective, a new Black Creek crossing to the east would be preferred to allow for less complex staging and there are also existing hydro lines on the west side of Trafalgar Road, which widening to the east only would result in less impacts.

Overall, the option to widen to the east only between 15 Side Road and Black Creek is preferred.

Alternative 1A was presented as the Technically Preferred Alternative at Public Information Centre 3 on December 2, 2015, see **Section 6.1.3.3**.