Evaluation Factors and Sub-Factors	Alternative S2-1	Alternative S2-2 - Preferred
	Summary of Potential Net Effects and Ranking	
1.0 Natural Environment		
1.1 Fish and Fish Habitat		
1.1.1 Fish Habitat	Standard net effects to watercourses as outlined in the accompanying memo at the following: **11 watercourses:** • 1 main stem river crossing (Credit River, 0.3 km), baitfish and trout migration • 1 permanent tributary (assumed coldwater), salmon spawning and/or rearing • 2 permanent tributaries (1 warmwater 0.3 km, unconfirmed fish community – Levi Creek, contributing habitat for Redside Dace downstream; and 1 coolwater 0.8 km, confirmed baitfish) • 1 intermittent watercourse (warmwater), unconfirmed fish community • 6 ephemeral headwater features, not fish habitat Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, offsetting / enhancement measures; until confirmed, net effects remain the same as potential effects: • Crossing the main stem Credit River containing trout migration, effects may be minimal following standard design/construction mitigation. • Majority of tributary identified as trout specialized habitat (i.e. spawning and/or rearing) would be enclosed under alignment unless tributary can be realigned depending on the design of the interchange and associated ramps • Crossing permanent tributary parallel within alignment, possibly requiring ~800 m of realignment. HIGH NET EFFECT	Standard net effects to watercourses as outlined in the accompanying memo at the following: **14 watercourses:** • 1 main stem river crossing (Credit River, 0.3 km), baitfish and trout migration • 1 permanent, watercourse identified as Redside Dace Recovery Habitat (Levi Creek) • 1 permanent tributary (to Levi Creek) coolwater, unconfirmed fish community (contributing habitat for Redside Dace) • 5 intermittent watercourses, unconfirmed fish community (1 of which is contributing habitat for Redside Dace) • 6 ephemeral headwater features (associated with Levi and Credit Rivers; 1 ephemeral oxbow scar at the Credit River) Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, offsetting / enhancement measures; until confirmed, net effects remain the same as potential effects: • Crossing the main stem Credit River containing trout migration in addition to supporting American Eel habitat / migration route, effects may be minimal following standard design/construction mitigation • Crossing Redside Dace recovery habitat can be done with minimal effects, mitigated following MNRF guidance document MODERATE NET EFFECT
	RANKING: 2nd This alternative crosses the greatest number of permanent water courses including a tributary contributing to Redside Dace habitat that runs parallel within the alternative, and a permanent tributary with salmonid spawning/rearing habitat. Mitigation of impacts to these features would be challenging.	**RANKING: 1st** This alternative crosses fewer permanent watercourses and does not impact sensitive salmonid spawning/rearing habitat. The one crossing of recovery habitat for Redside Dace is slightly skewed but can be mitigated following MNRF guidance document and discussions with MECP. Potential complex design / impacts at the interchange for the network of drainage features contributing to Redside Dace recovery habitat downstream. Overall, impacts to watercourses are more easily mitigated in this alternative.
1.1.2 Fish Community	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, offsetting / enhancement measures; until confirmed, net effects remain the same as potential effects: • Crossing parallel tributary possibly ~800 m realignment • Crossing parallel tributary identified as trout spawning and/or rearing, realignment likely prohibitive, potential for full enclosure. • Crossing Credit River trout/salmon migration corridor in addition to supporting American Eel habitat / migration route and habitat for Atlantic Salmon • 2 crossings of contributing habitat for Redside Dace HIGH NET EFFECT	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, offsetting / enhancement measures; until confirmed, net effects remain the same as potential effects: • Crossing of the 1 permanent Redside Dace Recovery habitat watercourse at slight skew may result in slightly increased net effects • Crossing Credit River trout/salmon migration corridor in addition to supporting American Eel habitat / migration route and Atlantic Salmon habitat MODERATE NET EFFECT
	RANKING: 2nd This alternative impacts sensitive salmonid species in spawning / rearing habitat, and potentially impacts Redside Dace by contributing to habitat downstream. Also impacts a relatively long reach of permanent watercourse supporting moderately sensitive coolwater species within (not perpendicular to) alignment.	**RANKING: 1st** With appropriate mitigation at Redside Dace crossing, no significant impacts to sensitive fish communities. Crossing of the Credit River could likely be designed to have minimal negative impacts to fish and fish habitat and have limited impact on American Eel habitat / migration route and Atlantic Salmon habitat.
1.2 Terrestrial Ecosystems		

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
1.2.1 Wildlife and Wildlife Habitat	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Large portions of small existing wildlife habitats will be removed. Net effects include: • Permanent loss of wildlife habitat including habitat for Species at Risk (SAR) and Species of Conservation Concern (SCC), confirmed Significant Wildlife Habitat (SWH) and other areas for breeding and rearing of young (e.g. amphibian breeding habitat) • Reduction of wildlife habitat quality through indirect effects that cannot be fully mitigated including edge effects (e.g. increased light and noise and the introduction of pathways for invasive species) and increased potential for animal-vehicle collisions • Removals through this alternative would represent ~19.8 ha losses, or complete removal for many habitat patches. • Removals would result in major fragmentation and edge effects for most patches. Loss of habitat would affect critical life stages through by removing habitat requirements (e.g. wetlands for amphibian breeding, forests for bat maternity colonies, etc.) MODERATE NET EFFECT	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Large portions of small existing wildlife habitats will be removed. Net effects include: • Permanent loss of wildlife habitat including confirmed habitat for Species at Risk (SAR) and Species of Conservation Concern (SCC), large tracts of confirmed SWH and other areas for breeding and rearing of young (e.g. amphibian breeding habitat) • Removals through this alternative would represent ~21.1 ha losses, or complete removal for many habitat patches. • Removals would result in major fragmentation and edge effects for most patches. Loss of habitat would affect critical life stages through by removing habitat requirements (e.g. wetlands for amphibian breeding, forests for bat maternity colonies, etc.). HIGH NET EFFECT
	RANKING: 1st The amount of wildlife habitat removed for Alternative S2-1 is less than Alternative S2-2.	**RANKING: 2nd** The amount of wildlife habitat removed for Alternative S2-2 is greater than Alternative S2-1.
1.2.2 Wetlands	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Portions of large existing wetland communities will be removed. Net effects include: • Removal of 2.2 ha of wetland, of which ~2.1 ha is PSW • The largest wetland in this section is Levi's Creek Wetland Complex (CR-LC-52) - this wetland will be insignificantly affected by this alternative, removing ~1.9 ha of this feature. • Churchville-Norval Wetland Complex will also be insignificantly affected by this alternative, removing ~0.3 ha of this feature. • The unevaluated wetland patch will be significantly affected by this alternative where ~0.05 ha will be removed from this feature. • Reduction in wetland quality through indirect effects that cannot be fully mitigated including edge effects (e.g. increased light, wind, road contaminants and the introduction of pathways for invasive species) and impacts to hydrologic and groundwater inputs that support these features MODERATE NET EFFECT	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Small portions of large existing communities will be removed. Net effects include: • This alternative will affect ~6.1 ha of wetland, of which ~5.4 ha is PSW. Impacts to features are moderate with removal of wetland communities. • Levi's Creek Wetland Complex will be insignificantly affected by this alternative, removing ~3.5 ha of this feature. • Churchville-Norval Wetland Complex will also be insignificantly affected by this alternative, removing ~1.9 ha of this feature. • The unevaluated wetland patch will be moderately affected where ~0.7 ha will be partially removed. • Reduction in wetland quality through Indirect effects that cannot be fully mitigated including edge effects (e.g. increased light, wind, road contaminants and the introduction of pathways for invasive species) and impacts to hydrologic and groundwater inputs that support these features MODERATE NET EFFECT
	RANKING: 1st Both alternatives affect PSW and unevaluated wetlands. This alternative will affect a smaller area and fewer wetland patches.	**RANKING: 2nd** Both alternatives affect PSW and unevaluated wetlands. This alternative will affect a greater area with more wetland patches.
1.2.3 Woodlands and Vegetation	Net effects associated with the alternatives are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Opportunities for reducing net effects are limited to off-site compensation. Net effects include:	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Opportunities for reducing net effects are limited to off-site compensation. Net effects include:

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	• Removal of ~17.7 ha of vegetation communities including deciduous forest, mixed forest, cultural woodland and meadow • No interior woodland habitat is impacted by this alternative. • Two potentially significant woodlands encompassing ~8.3 ha is affected by this alternative associated with Credit River (Patch CR-NP-55 and CR-NP-63). • No interior woodland habitat is affected by this alternative. • One potentially significant valley land associated with the Credit River is affected by this alternative. • Reduction in vegetation community quality through indirect effects that cannot be fully mitigated including effects from road contaminants (e.g. salt, heavy metals, sediment / debris), introduction of pathways for invasive species, edge / exposure impacts (e.g. canopy blow down) Large woodland and other vegetated communities associated with the Credit River and Levi's Creek represent the majority of remaining patches of natural vegetation in the general landscape. MODERATE NET EFFECT	• Removal of ~19.8 ha of vegetation communities including deciduous forest, mixed forest, deciduous swamp and meadow • One potentially significant woodland (~4.7 ha removal) is affected by this alternative associated with Credit River (Patch CR-NP-55 and CR-NP-63). • No interior woodland habitat is impacted by this alternative. • One potentially significant valley land associated with the Credit River is affected by this alternative. • Reduction in vegetation community quality through Indirect effects that cannot be fully mitigated including effects from road contaminants (e.g. salt, heavy metals, sediment / debris), introduction of pathways for invasive species, edge / exposure impacts (e.g. canopy blow down) Large woodland and other vegetated communities associated with the Credit River and Levi's Creek represent the majority of remaining patches of natural vegetation in the general landscape. This alternative will affect larger, more contiguous woodland patches. HIGH NET EFFECT
	RANKING: 1st Both alternatives affect woodland and other communities. This alternative will affect a smaller area of less contiguous woodland features.	**RANKING: 2nd** Both alternatives affect woodland and other communities. This alternative will affect a greater area of contiguous woodland features.
1.2.4 Designated/Special/Natural Areas	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Net effects include: • There are no ESA, ESPAs, ANSI or other designated areas within this alternative. • There are no national or provincial parks within this alternative. • There are no Conservation Authority lands within this alternative. • This alternative is within the Greenbelt Plan Area – Natural Heritage System, ~461 m (~15 ha) of the alternative Net effects include removals of portions of Peel Region 'Core Areas of Greenlands System' and Region of Halton Key Features including fragmentation of two minor riparian zones and complete removal of an associated woodlot, and edge removal for one woodlot as described in sections above. MODERATE NET EFFECT	Net effects associated with the alternative are dependent on the ability to implement avoidance, mitigation, compensation / enhancement measures; until confirmed, net effects remain the same as potential effects. Net effects include: • There are no ESA, ESPAs, ANSI or other designated areas within this alternative. • There are no national or provincial parks within this alternative. • There are no Conservation Authority lands within this alternative. • This alternative is within the Greenbelt Plan Area – Natural Heritage System, ~343 m (~11 ha) of the alternative Net effects include removals of portions of Peel Region 'Core Areas of Greenlands System' including fragmentation and removal of forest for a significant riparian corridor (~0.7 km width) and a riparian area of ~0.5 km width as described in the sections above. Areas of removal are relatively less than the other alternative. LOW NET EFFECT
	RANKING: 2nd Effect to Greenlands. Both alternatives have the potential to affect Key Features. This alternative will result in greater area of Key Features removed.	**RANKING: 1st** Effect to Greenlands. Both alternatives have the potential to affect Key Features. This alternative will result in less area of Key Features removed.
1.3 Ecosystem Services	**Relative ES Value** • Agriculture: Moderate • Natural Cover: High • Cumulative: Moderate **ES Value Representation** • Agriculture: 24% • Natural Cover: 76% MODERATE NET EFFECT	**Relative ES Value** • Agriculture: Low • Natural Cover: Moderate • Cumulative: Moderate **ES Value Representation** • Agriculture: 21% • Natural Cover: 79% MODERATE NET EFFECT
	RANKING: 2nd	**RANKING: 1st**

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	While both alternatives have an overall moderate net effect using the Ecosystem Service (ES) Net Effects weighting, both land use ES value categories were higher for S2-1 than S2-2, making this alternative less preferred.	While both alternatives have an overall moderate net effect using the Ecosystem Service (ES) Net Effects weighting, both land use ES value categories were lower for S2-2 than S2-1 making this the preferred alternative.
1.4 Groundwater		
1.4.1 Areas of Groundwater Recharge or Discharge	• Small loss of recharge due to footprint and small loss of discharge due to interception. LOW NET EFFECT	• Small loss of recharge due to footprint and small loss of discharge due to interception. LOW NET EFFECT
	RANKING: 1st Same Net Effect	**RANKING: 1st** Same Net Effect
1.4.2 Groundwater Source Areas and Wellhead Protection Areas	• No Net Effects NO NET EFFECT	• No Net Effects NO NET EFFECT
	RANKING: 1st Same Net Effect	**RANKING: 1st** Same Net Effect
1.4.3 Large Volume Wells	• No Net Effects. NO NET EFFECT	• No net effects. NO NET EFFECT
	RANKING: 1st Same Net Effect	**RANKING: 1st** Same Net Effect
1.4.4 Private Wells	• Potential reduction in water quality within the shallow aquifer in at least 17 wells due to potential salt issue only. • At least 5 wells are to be removed/decommissioned by alternative. LOW NET EFFECT	• Potential reduction in water quality within the shallow aquifer in at least 20 wells due to potential salt issue only. • At least 14 wells are to be removed/decommissioned by alternative. MODERATE NET EFFECT
	RANKING: 1st This alternative has fewer shallow wells and less wells to be decommissioned.	**RANKING: 2nd** This alternative has more shallow wells and more wells to be decommissioned.
1.4.5 Groundwater-Dependent Commercial Enterprises	• One commercial use and wells displaced. MODERATE NET EFFECT	• No commercial use and wells displaced. LOW NET EFFECT
	RANKING: 2nd This alternative includes the presence of a commercial well.	**RANKING: 1st** No commercial wells present in this alternative.
1.4.6 Groundwater-Sensitive Ecosystems	• Low potential to affect sensitive ecosystems with wetland areas in buffer zone and warmwater streams that are not highly dependent on groundwater. Some loss of discharge function anticipated. LOW NET EFFECT	• Low potential to affect sensitive ecosystems with wetland areas in buffer zone and warmwater streams that are not highly dependent on groundwater. Some loss of discharge function anticipated. LOW NET EFFECT
	RANKING: 1st Same Net Effect	**RANKING: 1st** Same Net Effect
1.5 Surface Water		
1.5.1 Watershed / Subwatershed Drainage Features / Patterns	• Perpendicular crossings will not be an issue and can be accommodated using culverts. There may be an opportunity in the headwaters of Levi Creek to combine some adjacent features to reduce the number of culverts. • Long realignments are going to be required as tributaries of Levi Creek and East Sixteen Mile Creek are beneath the footprint of the roadway. • 10th Line interchange results in a significant impact. • Bovaird interchange results in a moderate impact.	• While there are a number of crossings, there is one significant crossing over Levi Creek and another over the Credit River. The impacts are mitigatable or avoidable in all cases. • The Winston Churchill Blvd. interchange, while not ideally situated, is mitigatable and/or avoidable through interchange design or repositioning.

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	MODERATE NET EFFECT	LOW NET EFFECT
	RANKING: 2nd More challenging impacts on crossings; interchanges are problematic due to proximity to watercourses.	**RANKING: 1st** Minimal impacts compared to S2-1.
1.5.2 Surface Water Quality and Quantity	• Introduces 53 ha of impervious area, including 21 ha to East Sixteen Mile Creek watershed, 24 ha to Levi Creek watershed and 7 ha to the main branch of Credit River; • Realignment of regulated watercourse approximately 760 m (tributary of East 16 Mile Creek); • Medium impacts on quality through direct and indirect discharges of contaminated and sediment-laden run-off, thermal impact on the coolwater system; • Medium impacts on hydrology due to changes in ground permeability; • High effects on modifications to surface drainage patterns and alterations of water bodies. HIGH NET EFFECT	• Introduces 44 ha of impervious area, including 4 ha to East Sixteen Mile Creek watershed, 10 ha to Mullet Creek watershed, 20 ha to Levi Creek watershed and 10 ha to the main branch of Credit River; • Medium impacts on quality through direct and indirect discharges of contaminated and sediment-laden run-off, thermal impact on the coolwater system. • Medium impacts on hydrology due to changes in ground permeability. • Medium effects on modifications to surface drainage patterns and alterations of water bodies. MODERATE NET EFFECT
	RANKING: 2nd Larger impervious area; realignment of regulated watercourse resulting in potential alteration to drainage pattern.	**RANKING: 1st** Smaller impervious area.
1.6 Air Quality and Climate Change		
1.6.1 Local and regional air quality impacts; greenhouse gas emissions	• Some residences on 9th Line, Embleton Rd., 10th Line and Winston Churchill Blvd. are anticipated to be close enough to the GTAW to experience a change in air quality; however, air pollutants will remain within acceptable levels. LOW NET EFFECT	• Some residences on 10th Line, Embleton Rd., Winston Churchill Blvd. and Heritage Rd. are anticipated to be close enough to the GTAW to experience a change in air quality; however, air pollutants will remain within acceptable levels. LOW NET EFFECT
	RANKING: 2nd Approximately the same number of affected residences as S2-2, but contributes to a longer overall corridor length.	**RANKING: 1st** Approximately the same number of affected residences as S2-1, but this alternative also contributes to the shortest overall corridor length, thus reducing the contribution to regional emissions of GHG and air pollutants.
2.0 Land Use / Socio-Economic Environment		
2.1 Land Use Planning Policies, Goals, Objectives		
2.1.1 Indigenous Land Claims	Treaties including Nanfan (1701), Treaty 3 (1795), Treaty 3.75 (1795), Treaty 13 (1805), Treaty 13A (1805), Treaty 18, 1818, Treaty 19 (1918), Williams Treaty (1923), as well as various Assertions and Claims. • Additional Indigenous Assertions and/or Claims may be filed and/or proven at any time. MODERATE NET EFFECT	Treaties including Nanfan (1701), Treaty 3 (1795), Treaty 3.75 (1795), Treaty 13 (1805), Treaty 13A (1805), Treaty 18, 1818, Treaty 19 (1918), Williams Treaty (1923), as well as various Assertions and Claims. • Additional Indigenous Assertions and/or Claims may be filed and/or proven at any time. MODERATE NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
2.1.2 Provincial / Federal Land Use Planning Policies / Goals / Objectives	• Impacts PPS agricultural lands and public space and recreation policies. • Impacts 149 hectares of Agricultural Lands. • Impacts 12 hectares of Greenbelt lands Protected Countryside – Natural Heritage System. • Impacts 36 hectares of Environmental Policy Area. • Impacts Agricultural System to greatest extent. MODERATE NET EFFECT	• Impacts PPS agricultural and employment lands and housing policies. • Impacts 74 hectares of Agricultural Lands. • Impacts 11 hectares of Greenbelt lands Protected Countryside – Natural Heritage System. • Less Impact on Agricultural System. LOW NET EFFECT
	RANKING: 2nd	**RANKING: 1st**

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	Impacts a high amount of agricultural lands and System; largest overall impact on designated lands.	Impacts a low amount of agricultural and Greenbelt lands.
2.1.3 Municipal (local and regional) Land Use Planning Policies / Goals / Objectives	• Does not provide exposure or access to Employment Lands. • Low effect on the Norval Secondary Plan. • Low effect on the Bram West Secondary Plan. • Cannot further reduce impacts to Bram West Secondary Plan or Norval Secondary Plan; moving route south would increase impacts to Bram West Secondary Plan and moving route north would increase impacts on Norval Secondary Plan. MODERATE NET EFFECT	• Provides good exposure for future employment lands. • Moderate impact on the Bram West Secondary Plan. LOW NET EFFECT
	RANKING: 2nd Has the greatest impact on agricultural lands as it bisects the lands within the Agricultural System. This alternative does not provide access to employment lands and impacts a portion of the Norval Secondary Plan at the southern point. It has minimal impact on the Bram West Secondary Plan.	**RANKING: 1st** Has the least impact on agricultural lands and provides better exposure/ access to employment lands in Halton Hills, but removes a portion of the designated employment lands. This alternative has a greater impact on the Bram West Secondary Plan, but does provide a 400-series highway connection to the area.
2.1.4 Development Objectives of Private Property Owners	• Likely interest to develop lands but no applications made because of the GTA West Study Area. LOW NET EFFECT	• Likely interest to develop lands but no applications made because of the GTA West Study Area. LOW NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
2.2 Land Use – Community		
2.2.1 First Nation Reserves	• No reserves in study area. NO NET EFFECT	• No reserves in study area. NO NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
2.2.2 Indigenous Sacred Areas	• No known or reported Indigenous Sacred Areas. NO NET EFFECT	• No known or reported Indigenous Sacred Areas. NO NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
2.2.3 Urban and Rural Residential Uses and Properties	• Two (2) residential properties impacted (4.6 hectares). LOW NET EFFECT	• Eleven (11) residential properties impacted (14.93 hectares). MODERATE NET EFFECT
	RANKING: 1st Has less impact on residential properties compared to S2-2.	**RANKING: 2nd** Has a greater impact on properties compared to S2-1.
2.2.4 Commercial/ Industrial Uses and Properties	• Impacts three (3) properties (Sheridan Nurseries, Sun Opta and Crawford Village Bakery). LOW NET EFFECT	• Impacts five (5) properties (Naka Greenhouses, Carl Laidlaw Orchards and Orchlaw Farms, residential dwelling with no business name, Blue Sky Kitchen and Bath Repair). MODERATE NET EFFECT
	RANKING: 1st This alternative impacts agricultural commercial properties but does not impact the use/access of the agricultural commercial properties it impacts.	**RANKING: 2nd** This alternative has significant impacts on a greater number of commercial properties.
2.2.5 Recreational Areas and Tourist Attractions	• No impacts.	• No impacts.

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	NO NET EFFECT	NO NET EFFECT
	RANKING: 1st No impacts	**RANKING: 1st** No impacts
2.2.6 Community Facilities / Institutions	• No impacts. NO NET EFFECT	• No impacts. NO NET EFFECT
	RANKING: 1st No impacts	**RANKING: 1st** No impacts
2.2.7 Municipal Infrastructure and Public Service Facilities	• No impacts. NO NET EFFECT	• No impacts. NO NET EFFECT
	RANKING: 1st No impacts	**RANKING: 1st** No impacts
2.3 Noise Sensitive Areas (NSA's)		
2.3.1 Transportation Noise	• Several residences on 9th Line, Embleton Rd., 10th Line and Winston Churchill Blvd. are anticipated to be close enough to the GTAW to experience a significant change in noise level. LOW NET EFFECT	• Several residences on 10th Line, Embleton Rd., Winston Churchill Blvd. and Heritage Rd. are anticipated to be close enough to the GTAW to experience a significant change in noise level. LOW NET EFFECT
	RANKING: 1st Slightly less change in sound level at affected residences than S2-2	**RANKING: 1st** Slightly greater change in sound level at affected residences than S2-1
2.4 Land Use – Resources		
2.4.1 Indigenous Treaty Rights and Land Use Management	Treaties including Nanfan (1701), Treaty 3 (1795), Treaty 3.75 (1795), Treaty 13 (1805), Treaty 13A (1805), Treaty 18, 1818, Treaty 19 (1918), Williams Treaty (1923), as well as various Assertions and Claims. • Additional Indigenous Assertions and/or Claims may be filed and/or proven at any time. MODERATE NET EFFECT	Treaties including Nanfan (1701), Treaty 3 (1795), Treaty 3.75 (1795), Treaty 13 (1805), Treaty 13A (1805), Treaty 18, 1818, Treaty 19 (1918), Williams Treaty (1923), as well as various Assertions and Claims. • Additional Indigenous Assertions and/or Claims may be filed and/or proven at any time. MODERATE NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
2.4.2 Agriculture / Specialty Crop • Removal or sterilization of Class 1 – 3 agricultural lands • Specialty Crops/Cropland affected • Cropland affected • Livestock operations affected • Loss of agricultural buildings	• Loss of 173.7 ha of Class 1 – 3 lands • Loss of 4.2 ha of nursery stock cropland • Loss of 118.7 ha of common field crop cropland Loss of 11.2 ha of open field cropland Loss of 23.4 ha of forage/pasture cropland • Four livestock operations affected (Horse/beef, 2 Dairy, Llama) • Loss of one plastic covered, semi-circular hay storage, one bank barn, one farm residential unit, one retired pole barn with extension, one abandoned farm residence, six plastic greenhouses, six glass and plastic greenhouses, one small bank barn plus extension, one machine shed, one shed, one farm residential unit	• Loss of 105.5 ha of Class 1 – 3 lands • Loss of 9.2 ha of orchard lands • Loss of 38.5 ha of common field crop cropland Loss of 1.2 ha of open field cropland Loss of 9.9 ha of forage/pasture cropland Loss of 10.8 ha of small grain cropland • Two livestock operations affected (Horse, Dairy) • Loss of one pole barn (retired), and one farm residential unit, one pole barn

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
• Agricultural buildings within 50 m	• One bank barn, one pole barn, five plastic greenhouses, two glass and plastic greenhouses within 50 m	• One pole barn and farm residential unit, one bank barn and farm residential unit, and two sheds unit within 50 m
• Field crop operations affected	• Twelve field crop operations affected	• Thirteen field crop operations affected
• Farm properties greater than 20 ha affected	• Fourteen farm properties greater than 20 ha affected	• Ten properties greater than 20 ha affected
• Farm properties less than 20 ha affected	• Seven farm properties less than 20 ha affected	• Ten farm properties less than 20 ha affected
• Severed parcels greater than 20 ha created	• Six severed parcels greater than 20 ha created	• Five severed parcels greater than 20 ha created
• Severed parcels less than 20 ha created	• Twenty-one severed parcels less than 20 ha created	• Fifteen severed parcels less than 20 ha created
• Landlocked parcels created	• Four landlocked parcels created	• Four landlocked parcels created
• High investment operations affected	• Four high investment operations affected (land only)	• Two high investment operations affected (land only)
• Farm equipment transportation routes affected	• No effect	• No effect
• Division of agricultural community areas	• No effect	• No effect
• Loss of tile drainage	• Loss of 6.4 ha of systematic tile drainage (two properties)	• No effect
	HIGH NET EFFECT	MODERATE NET EFFECT
	RANKING: 2nd • Greater loss of Class 1-3 lands • Less loss of lands used for nursery stock cropland • Greater loss of cropland • Greater number of livestock operations affected • Greater loss of agricultural buildings • Greater number of high investment operations affected	**RANKING: 1st** • Less loss of Class 1 – 3 lands • Greater loss of lands used for nursery stock cropland • Less loss of cropland • Fewer number of livestock operations affected • Fewer number of agricultural buildings lost • Fewer high investment operations affected
2.4.3 Recreation	• No impacts. NO NET EFFECT	• No impacts. NO NET EFFECT
	RANKING: 1st No impacts	**RANKING: 1st** No impacts
2.4.4 Aggregate and Mineral Resources	• No impacts. NO NET EFFECT	• No impacts. NO NET EFFECT
	RANKING: 1st No impacts.	**RANKING: 1st** No impacts.
2.5 Major Utility Transmission Corridors and Pipelines		
2.5.1 Major Existing Utility Transmission Corridors and Pipelines	• No impacts NO NET EFFECT	• No impacts NO NET EFFECT
	RANKING: 1st	**RANKING: 1st**

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	No impacts	No impacts.
2.5.2 Major Proposed Utility Transmission Corridors and Pipelines	• No impacts. NO NET EFFECT	• No impacts. NO NET EFFECT
	RANKING: 1st No impacts.	**RANKING: 1st** No impacts.
2.6 Contaminated Property and Waste Management	**Properties within alternative:** • Four (4) commercial / light industrial properties. **Properties within 250 m of alternative:** • Two (2) commercial / light Industrial properties; • One (1) institutional (religious centre). MODERATE NET EFFECT	**Properties within alternative:** • Six (6) commercial / agricultural business properties. **Properties within 250 m of alternative:** • One (1) commercial /agricultural business properties; • One (1) institutional property (community centre). HIGH NET EFFECT
	RANKING: 1st One (1) property of high concern to be directly impacted; Three (3) properties of medium concern to be directly impacted; One (1) property of high concern to be indirectly impacted; Two (2) properties of medium concern to be indirectly impacted.	**RANKING: 2nd** One (1) property of high concern to be directly impacted; Five (5) properties of medium concern to be directly impacted; Two (2) properties of medium concern to be indirectly impacted.
2.7 Landscape Composition		
2.7.1 Terrain	• Predominantly level, flat topography, agricultural land uses with some significant natural features and associated valley topography at the north end. Greenbelt – Protected Countryside at the north end of this section. • Effect on 13 watercourses, some mitigation/ realignment is possible, including 10 crossings of headwater swales / drainage features of Levi Creek (~9 km of impact). • This alternative interrupts Levi's Creek and Churchville-Norval Wetland Complexes • Effect may be minimized on Credit River crossing due to generally straight and stable potential alignment of bridge. • Increased noise and light pollution to surrounding uses, primarily agricultural operations, wildlife and vegetation communities buffered through topography, planting and fencing. HIGH NET EFFECT	• Predominantly level, flat agricultural land with some significant natural features and associated valley topography at the north end. Greenbelt – Protected Countryside at the north end of this section. • Effect on 17 watercourses, some mitigation/ realignment is possible. Crosses the Credit River, several streams and associated floodplain areas. Credit River crossing runs adjacent to the Trans Canada pipeline easement. • This alternative crosses 3-4 small PSWs as well as 1-2 unclassified water bodies and an unevaluated wetland. Interrupts southern end of the Churchville-Norval wetland complex at north end of route. • Major landscape level movement corridors which are affected may be reconnected, some opportunity for enhancement along alternative. • Increased noise and light pollution to surrounding uses, primarily agricultural operations, residential and rural commercial uses, wildlife and vegetation communities, buffered through topography, planting and fencing. HIGH NET EFFECT
	RANKING: 1st Primarily flat topography and agricultural fields (fewer existing buildings), larger crossing of the Credit River but with less effect on surrounding lands, similar impact on Levi's Creek and associated wetlands and woodlots, more main/permanent watercourse crossings.	**RANKING: 1st** Mostly flat topography and agricultural fields with a few built-up areas (more existing buildings), smaller crossing of the Credit River but greater effect on surrounding lands and similar effect on Levi's Creek and associated wetlands and woodlots, fewer main/permanent watercourse crossings.
2.7.2 Vegetation	• Interrupts 1-2 linear vegetation communities (woodlots and PSWs) near the north end of this alternative. Interrupts the Churchville-Norval wetland complex. • Interrupts the northwestern end of a significant urban wooded area near Guelph Street / Bovaird Drive West. • East of Tenth Line affects a small woodlot which surrounds a portion of a PSW and Levi's Creek. • Affects several small vegetative communities/woodlots near Side Road 5. • Indirect effects cannot be fully mitigated, expected reduction in wetland / woodlot quality including increased noise and light pollution, road contaminants, introduction of pathways for invasive species, edge / exposure, and groundwater inputs.	• Interrupts 2-3 linear vegetation communities (woodlots and PSWs) and crosses the Churchville-Norval wetland complex and interrupts a significant urban wooded area. • One significant valley land associated with the Credit River is affected. • Affects two woodlots west of Tenth Line. • Indirect effects cannot be fully mitigated, expected reduction in wetland / woodlot quality including increased noise and light pollution, road contaminants, introduction of pathways for invasive species, edge / exposure, and groundwater inputs.

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	MODERATE NET EFFECT	MODERATE NET EFFECT
	RANKING: 1st Fewer linear vegetation communities disturbed and smaller area of vegetation removal than in S2-2; crosses at the end of the Churchville-Norval wetland complex and significant urban wooded area.	**RANKING: 2nd** More linear vegetation communities disturbed and greater area of vegetation removal than in S2-1; crosses in the middle of the wetland complex and significant urban wooded area.
2.7.3 Visual Impacts	• Diminished aesthetic quality of scenic views, reduced visual effect through mitigation / compensation measures. • Sensitive viewers of rural residences on Winston Churchill Blvd. (2 clusters east and west of this alternative). • Sensitive viewers of the Village of Norval to the west of this alternative. • Moderate impacts to sensitive receptor of expanding subdivision south of Georgetown west of 10th Line and Regional Road 10. • Significant existing vista heading southwest on Bovaird Drive, north of the Credit River valley falls under this alternative where it crosses Bovaird Drive. • Southern portion of this alternative passes through predominantly level agricultural land. • Small vista north of this alternative on Tenth Line. • Vista of farmland at Fifth Side Road crossing. • Low landscape absorptivity at the south end of this alternative due to primarily flat open lands, moderate absorptivity at north end due to varied topography and greater vegetation cover, but also elevated highway at crossings. MODERATE NET EFFECT	• Diminished aesthetic quality of scenic views, reduced visual effect through mitigation / compensation measures. • Sensitive viewers of rural residential clusters (2) east of this alternative on Embleton Road as well as a small vista (valley). • Sensitive viewers of Green Acres Farm falling partially within this alternative. • Low impacts to sensitive receptor of new subdivision east of Heritage Road. • Visual effect from Heritage Road heading north to the Credit River Bridge, will see new highway crossing for Credit River off to the left. • This alternative cuts through a scenic rural landscape visible from Winston Churchill Blvd. with significant grade impacts and the view towards the river will be replaced by the view of the new road which goes up from there. • Smaller (narrower) crossing of the Credit River in S2-2. • Low landscape absorptivity of this alternative at the south end due to primarily flat open lands, moderate absorptivity at north end of this alternative due to varied topography and greater vegetation cover, but also elevated highway at crossings. MODERATE NET EFFECT
	RANKING: 2nd Significant vista from Bovaird would fall under this alternative, more residential clusters (sensitive viewers) impacted by this alternative, wider crossing of the Credit River.	**RANKING: 1st** Several existing views slightly impacted, fewer residential clusters (sensitive viewers) impacted by this alternative, view of Croatian Social and Cultural Centre from Winston Churchill Blvd (heading north) will likely be obstructed, view from Heritage Road will likely include new highway, narrower crossing of the Credit River.
2.7.4 Aesthetics	• Opportunity for significant views from the corridor to the Greenbelt Area near Guelph St./Bovaird Drive West. • Alternative passes through the Greenbelt Protected Countryside Area near Guelph St./ Bovaird Dr. W. • For highway users, aesthetically pleasing views into the Credit River from the north along the corridor are likely. MODERATE NET EFFECT	• Expansive views into the Credit River from the north for corridor users. • Current alignment would interrupt some existing uses (rural commercial and residential primarily). MODERATE NET EFFECT
	RANKING: 1st Better integration with existing buildings and structures, similar impact on landscape, significant potential views of the Credit River for both alternatives.	**RANKING: 2nd** More disruptive to existing uses, similar impact on landscape, significant potential views of the Credit River for both alternatives.
3.0 Cultural Environment		
3.1 Built Heritage Resources and Cultural Heritage Landscapes		
3.1.1 Built Heritage Resources	• There are one (1) listed (BHR 023) and three (3) potential (BHR 026, BHR 029 and BHR 044) BHRs affected by this alternative. MODERATE NET EFFECT	• There is one (1) potential (BHR 037) BHR affected by this alternative. LOW NET EFFECT
	RANKING: 2nd There are one (1) listed and three (3) potential BHRs affected by this alternative which will require further evaluation in order to determine their Cultural Heritage Value and Interest. Once Cultural Heritage Value and Interest has been determined, avoidance, protection and mitigation measures must be completed	**RANKING: 1st** There is one (1) potential BHR affected by this alternative which will require further evaluation in order to determine their Cultural Heritage Value and Interest. Once Cultural Heritage Value and Interest has been determined, avoidance, protection and mitigation measures must be completed

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
3.1.2 Heritage Bridges	• There are no Heritage Bridges affected by this alternative. NO NET EFFECT	• There are no Heritage Bridges affected by this alternative. NO NET EFFECT
	RANKING: 1st There are no Heritage Bridges affected by this alternative.	**RANKING: 1st** There are no Heritage Bridges affected by this alternative.
3.1.3 Cultural Heritage Landscapes	• There are one (1) listed (CHL 043) and three (3) potential (CHL 028, CHL 042 and CHL 055) CHLs affected by this alternative. MODERATE NET EFFECT	• There are two (2) listed (CHL 046 and CHL 047) and two (2) potential (CHL 048 and CHL 049) CHLs affected by this alternative. MODERATE NET EFFECT
	RANKING: 1st There are one (1) listed and three (3) potential CHLs affected by this alternative which will require further evaluation in order to determine their Cultural Heritage Value and Interest. Once Cultural Heritage Value and Interest has been determined, avoidance, protection and mitigation measures must be completed.	**RANKING: 1st** There are two (2) listed and two (2) potential CHLs affected by this alternative which will require further evaluation in order to determine their Cultural Heritage Value and Interest. Once Cultural Heritage Value and Interest has been determined, avoidance, protection and mitigation measures must be completed.
3.2 Archaeology		
3.2.1 Pre-Contact and Contact Indigenous Archaeological Sites	• No registered sites; however, archaeological potential is present within much of this alternative. LOW NET EFFECT	• One (1) registered site, and archaeological potential is present within much of this alternative. LOW NET EFFECT
	RANKING: 1st No registered Pre-Contact and Contact Indigenous Archaeological Sites are present within the alternative. 182 hectares of undisturbed land containing archaeological potential.	**RANKING: 2nd** One (1) registered Pre-Contact and Contact Indigenous Archaeological Site is present within the alternative. 166 hectares of undisturbed land containing archaeological potential.
3.2.2 Historic Euro-Canadian Archaeological Sites	• No registered sites; however, archaeological potential is present within much of this alternative. LOW NET EFFECT	• No registered sites; however, archaeological potential is present within much of this alternative. LOW NET EFFECT
	RANKING: 1st No registered Euro-Canadian sites are present within the alternative. 182 hectares of undisturbed land containing archaeological potential.	**RANKING: 1st** No registered Euro-Canadian sites are present within the alternative. 166 hectares of undisturbed land containing archaeological potential.
3.2.3 Indigenous Burial Sites	• No known or reported Indigenous Burial Sites. NO NET EFFECT	• No known or reported Indigenous Burial Sites. NO NET EFFECT
	RANKING: 1st No difference between alternatives.	**RANKING: 1st** No difference between alternatives.
3.2.4 Cemeteries	• No registered cemeteries are present within this alternative. LOW NET EFFECT	• No registered cemeteries are present within this alternative. LOW NET EFFECT
	RANKING: 1ST No registered cemeteries are present within this alternative. 182 hectares of undisturbed land containing archaeological potential.	**RANKING: 1st** No registered cemeteries are present within the alternative. 166 hectares of undisturbed land containing archaeological potential
4.0 Transportation		
4.1 System Capacity & Efficiency		
4.1.1 Movement of People	• Provides high capacity freeway and transitway operations. HIGH CAPACITY & EFFICIENCY	• Provides high capacity freeway and transitway operations. HIGH CAPACITY & EFFICIENCY
	RANKING: 1st Although volumes of trucks moved are similar, Alternative S2-1 provides direct connection to Georgetown.	**RANKING: 1st** Although volumes of people moved are similar, Alternative S2-2 provides connections to Brampton and Georgetown.

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
4.1.2 Movement of Goods	• Provides high capacity freeway operations. HIGH CAPACITY & EFFICIENCY	• Provides high capacity freeway operations with potential to divert local truck traffic at Winston Churchill Blvd. interchange. HIGH CAPACITY & EFFICIENCY
	RANKING: 1st Although volumes of trucks moved are similar, Alternative S2-1 provides direct connection to Georgetown.	**RANKING: 1st** Although volumes of trucks moved are similar, Alternative S2-2 provides connections to Brampton and Georgetown.
4.1.3 System performance during peak periods	• Overall V/C ratios indicate high utilization without exceeding capacity on the freeway, but capacity is exceeded on the 10th Line near the interchange. MODERATE PERFORMANCE	• Overall V/C ratios indicate high utilization without exceeding capacity HIGH PERFORMANCE
	RANKING: 2nd Analysis indicates slightly lower performance on the local road network	**RANKING: 1st** Analysis indicates slightly better performance on the local road network
4.2 System reliability / redundancy	• Good opportunities for redundancy on the local road network. MODERATE REDUNDANCY	• Opportunities for redundancy on arterial road network are limited by the skew of the alternative relative to the arterial roads. LOW REDUNDANCY
	RANKING: 1st Neither alternative has opportunities for redundancy on the freeway network, but Alternative S2-1 has better opportunities for redundancy on the local road network.	**RANKING: 2nd** Neither alternative has opportunities for redundancy on the freeway network, but Alternative S2-1 has better opportunities for redundancy on the local road network.
4.3 Safety		
4.3.1 Traffic Safety	• No anticipated safety concerns. NO NET EFFECT	• No anticipated safety concerns. NO NET EFFECT
	RANKING: 1st No discernable difference between the alternatives.	**RANKING: 1st** No discernable difference between the alternatives.
4.3.2 Emergency Access	• High potential to improve access without reductions to existing access HIGH ACCESS	• High potential to improve access without reductions to existing access HIGH ACCESS
	RANKING: 1st No discernable difference between the alternatives.	**RANKING: 1st** No discernable difference between the alternatives.
4.4 Mobility & Accessibility		
4.4.1 Modal integration and balance	• Opportunities for intermodal connections at transitway station and carpool lots. MODERATE POTENTIAL FOR IMPROVEMENT	• Opportunities for intermodal connections at transitway station and carpool lots. MODERATE POTENTIAL FOR IMPROVEMENT
	RANKING: 1st No discernable difference between the alternatives.	**RANKING: 1st** No discernable difference between the alternatives.
4.4.2 Linkages to Population and Employment Centres	• Improved access to existing and future population and employment areas. MODERATE ACCESSIBILITY	• Improved access to existing and future population and employment areas. MODERATE ACCESSIBILITY
	RANKING: 1st Alternative S2-1 provides linkage to Georgetown.	**RANKING: 1st** Alternative S2-2 provides linkage to Georgetown and Brampton.
4.4.3 Recreation and Tourism Travel	• Provides inter-regional connections from Georgetown. LOW SUPPORT	• Provides inter-regional connections from Brampton and Georgetown. LOW SUPPORT
	RANKING: 1st	**RANKING: 1st**

Evaluation Factors and Sub-Factors	Alternative S2-1 Summary of Potential Net Effects and Ranking	Alternative S2-2 - Preferred Summary of Potential Net Effects and Ranking
	No discernable difference between the alternatives.	No discernable difference between the alternatives.
4.4.4 Accommodation for pedestrians, cyclists, snowmobiles, and specialized vehicles	• Opportunities to maintain existing routes across the corridor. LOW ACCOMMODATION	• Opportunities to maintain existing routes across the corridor. LOW ACCOMODATION
	RANKING: 1st No discernable difference between the alternatives.	**RANKING: 1st** No discernable difference between the alternatives.
4.5 Network Compatibility		
4.5.1 Network connectivity	• Flexibility to accommodate future Municipal Road initiatives (i.e. Norval By-pass, Bram-West Parkway). HIGH CONNECTIVITY	• Flexibility to accommodate future Municipal Road initiatives (i.e. Norval By-pass, Bram-West Parkway). HIGH CONNECTIVITY
	RANKING: 1st Alternative S2-1 provides s connection to Georgetown.	**RANKING: 1st** Alternative S2-2 provides connections to Brampton and Georgetown.
4.5.2 Flexibility for future expansion	• Opportunities to expand the freeway and transitway within the proposed right-of-way. MODERATE FLEXIBILITY	• Opportunities to expand the freeway and transitway within the proposed right-of-way. MODERATE FLEXIBILITY
	RANKING: 1st No discernable difference between the alternatives.	**RANKING: 1st** No discernable difference between the alternatives.
4.6 Engineering		
4.6.1 Constructability	• The Credit River Bridge will be on a curve and is longer than other alternatives. Credit River Valley is wider with steeper slopes. MODERATE POTENTIAL FOR CONSTRUCTABILITY ISSUES	• The Credit River Bridge will likely be on a tangent and is shorter than other alternatives. LOW POTENTIAL FOR CONSTRUCTABILITY ISSUES
	RANKING: 2nd The crossing of the Credit River for this alternative is slightly more complex	**RANKING: 1st** The crossing of the Credit River for this alternative is slightly less complex.
4.6.2 Compliance with design criteria	• Conforms to design criteria. HIGH CONFORMITY	• Conforms to design criteria. HIGH CONFORMITY
	RANKING: 1st No discernable difference between the alternatives	**RANKING: 1st** No discernable difference between the alternatives
4.7 Construction Cost	• Estimated cost: $200 to $310 million HIGH RELATIVE COST	• Estimated cost: $190 to 240 million MODERATE RELATIVE COST
	RANKING: 2nd	**RANKING: 1st**
4.8 Traffic Operations	• Volumes indicate some potential for operational issues at the 10th Line interchange. MODERATE POTENTIAL FOR NEGATIVE EFFECT	• Volumes and system design have low potential for reduced traffic operations. LOW POTENTIAL FOR NEGATIVE EFFECT
	RANKING: 2nd Alternative S2-1 has greater potential for operational issues at interchanges.	**RANKING: 1st** Alternative S2-2 has the lowest potential for operational issues related volumes or non-standard designs.