Tansley Bridge Assessment and Evaluation Table (Completed August 2010)

Factor/Criteria		Measures	OPTION 1 (Widen Tansley Bridge – 2 lanes to the north)	OPTION 2 (Widen Tansley Bridge – 4 lanes to the north)	OPTION 3 (Widen Tansley Bridge – maintain existing centreline)	OPTION 4 (Widen Tansley Bridge – 2 lanes to the south)
1.0 Socio-Economic Environment						
1.1	**Residential Communities**					
a	Number of existing residences displaced	#	0	0	0	1
b	Property required	ha	TOTAL – ~0.20ha (6 properties) ▪ 5m of frontage required for 300m ▪ 2m of frontage required for 290m	TOTAL – ~0.24ha (5 properties) ▪ 5m of frontage required for 300m ▪ 7m of frontage required for 75m ▪ 15m of frontage required for 30m	TOTAL – ~0.20ha (10 properties) ▪ 5m of frontage required for 280m ▪ 2m of frontage required for 250m	TOTAL – ~0.30ha (11 properties) ▪ 10m of frontage required for 130m ▪ 5m of frontage required for 290m ▪ 2m of frontage required for 200m
c	Potential effects to accessibility	Low/Medium/ High	Impact similar for all alternatives. The driveways with direct access to Dundas Street will be maintained, however, to accommodate the median busway the driveways will be restricted to right-in/right-out access.			
d	Impact to driveways	L/M/H	Low ▪ 2 driveways reduced by 10m ▪ 3 driveways reduced by 15m	High ▪ 2 driveways reduced by 15m ▪ 1 driveways reduced by 25m ▪ 3 driveways extended by 10m ▪ 2 driveways extended by 5m	Medium ▪ 5 driveways reduced by 15m ▪ 4 driveways reduced by 10m ▪ 1 driveways reduced by 5m	Medium ▪ 6 driveways reduced by 15m ▪ 3 driveways reduced by 20m
1.2	**Business Operations**					
a	Property required	ha	TOTAL – ~0.30ha ▪ Canada Brick – 0.20ha ▪ Car Wash – 0.05ha (within Region's easement) ▪ Laidlaw Bus Storage – 0.05ha	TOTAL – ~0.86ha ▪ Canada Brick – 0.59ha ▪ Car Wash – 0.13ha (beyond Region's easement) ▪ Laidlaw Bus Storage – 0.14ha	TOTAL – ~0.15ha ▪ Canada Brick – 0.08ha ▪ Car Wash – 0.02ha (within Region's easement) ▪ Laidlaw Bus Storage – 0.05ha	TOTAL – ~0.11ha ▪ Canada Brick – 0.09ha ▪ Laidlaw Bus Storage – 0.02ha
b	Number of existing businesses displaced	#	0	1 – Car wash building.	0	0
c	Potential effects to accessibility	L/M/H	Impact similar for all alternatives. The Car Wash and Laidlaw Bus Storage direct accesses to Dundas Street will be maintained, however, to accommodate the median busway the Laidlaw Bus Storage driveway will be restricted to right-in/right-out access.			
d	Impact to driveways	L/M/H	High ▪ Complete removal and reconstruction of Car Wash driveway. ▪ Complete removal and reconstruction of Laidlaw Bus Storage driveway. ▪ 15 m north shift of the Sutton Drive intersection resulting in reconstruction of the north leg to Canada Brick entrance.	High ▪ Complete removal and reconstruction of Car Wash driveway. ▪ Complete removal and reconstruction of Laidlaw Bus Storage driveway. ▪ 25 m north shift of the Sutton Drive intersection resulting in reconstruction of the north leg to Canada Brick entrance.	▪ Medium ▪ Driveway length of the Car Wash reduced by 5m. ▪ Complete removal and reconstruction of Laidlaw Bus Storage driveway. ▪ 8m north shift of the Sutton Drive intersection resulting in reconstruction of the north leg to Canada Brick entrance.	Low ▪ Complete removal and reconstruction of Laidlaw Bus Storage driveway. ▪ 3m north shift of the Sutton Drive intersection resulting in reconstruction of the north leg to Canada Brick entrance.
e	Impact to parking facilities		Medium ▪ Removal of approx. 2-3 m of Laidlaw Bus storage.	High ▪ Removal of approx. 8-10 m of Laidlaw Bus storage.	Low ▪ Removal of approx. 2-3 m of Laidlaw Bus Storage.	Low ▪ Removal of approx. 2-3 m of Laidlaw Bus Storage.

n/a – not applicable

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			▪ Removal of 3 m of the Car Wash fire route.	▪ Removal of the Car Wash fire route and approx. 7 m of parking.		
1.3	**Recreational Land Uses (Bronte Provincial Park)**					
a	Property required	ha	~0.16ha	~0.16ha	~0.17ha	~0.32ha
b	Potential effect to accessibility	L/M/H	Impact similar for all alternatives. A park access (non-public access) that is located west of Tremaine Road will be restricted to right-in/right-out access.			
c	Impact to driveways	L/M/H	Impact similar for all alternatives. The driveway length of the park access will be reduced.			
1.4	**Places of Worship**					
a	Property required	ha	n/a			
b	Potential effects to accessibility	L/M/H	n/a			
c	Impact to driveways	L/M/H	n/a			
1.5	**Emergency Services**					
a	Property required	ha	n/a			
b	Potential effects to accessibility	L/M/H	n/a			
c	Impact to driveways	L/M/H	n/a			
1.6	**Government-Owned Property (Owned by Government Services)**					
a	Property required	ha	~0.18ha	~0.59ha	~0.08ha	-
b	Potential effects to accessibility	L/M/H	n/a			
c	Impact to driveways	L/M/H	n/a			
1.7	**Noise**		Noise analysis will be completed during the detailed assessment and evaluation of alternatives. It is expected that the potential increase in noise as a result of the proposed widening would be similar for all alternatives and would be less than 5 dBA. [It should be noted that the doubling of traffic volume would results in a 3 dBA increase in sound level, and a rate of 3 dBA per distance doubling between the source and the receiver occurs].			
1.8	**Air Quality**					
a	Potential effects on local air quality	L/M/H	All alternatives should reduce congestion on Dundas Street and result in less vehicle idling and subsequently less emissions. In addition, all alternatives support transit initiatives which will reduce vehicle emissions.			
1.9	**Pedestrians**					
a	Provision of facilities for pedestrians		All alternatives include the provision of a 3.0 m multi-use path on both sides of the roadway.			
1.10	**Cyclists**					
a	Provision of facilities for cyclists		All alternatives include the provision of a 3.0 m multi-use path on both sides of the roadway.			
1.11	**Landscaping/Streetscaping**					
a	Impact to existing landscaping	L/M/H	Low Impact to 530 m of landscaping along 6 properties.	Low Impact to 520 m of landscaping along 4 properties.	Medium Impact to 605 m of landscaping along 9 properties.	High Impact to 710 m of landscaping along 9 properties.
b	Opportunity for improved landscaping/streetscaping		All alternatives provide the opportunity for improved landscaping/streetscaping.			
1.12	**Land Use**					
a	Compatibility with planning policies: ▪ Halton Region Official Plan (OP) ▪ Halton Region TMP ▪ City of Burlington OP ▪ Town of Oakville OP		▪ All alternatives are consistent with the Region's OP policies. ▪ All alternatives are consistent with the Region's TMP policies. ▪ All alternatives are consistent with the City of Burlington's OP policies. ▪ All alternatives are located outside of Oakville.			

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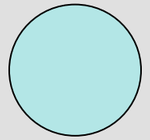
b	Conflicts with approved plan of subdivisions	L/M/H	No alternatives conflict with approved plans of subdivisions.			
c	Conflicts with approved secondary plans	L/M/H	No alternatives conflict with approved secondary plans.			
Socio-Economic Environment Summary						
			Option 4 is least preferred from a community perspective since it results in the displacement of 1 house. Option 4 also impacts the greatest amount of property and landscaping to accommodate the proposed widening. Option 2 is also not preferred as it results in displacement of a recently constructed (2009) Self-Service Car Wash. Option 2 has the greatest impact on the driveways along Dundas Street, impacting as much as 25 m from a driveway and extension of a driveway by 10 m. In addition, Option 2 also removes the greatest amount of Laidlaw bus storage. Although Option 1 has the lowest impact to driveways, Option 1 is not preferred since it results in the removal of the Car Wash driveway as well as the designated fire route. Option 3 is preferred since it does not displace any existing residential or business buildings. Option 3 also maintains the Car Wash's designated fire route. In addition, this option would result in a balanced property impact to the properties on both the north and south side of Dundas Street. ***Therefore, Option 3 is preferred from a socio-economic perspective.***			
2.0 Cultural Environment						
2.1	**Built Heritage Resources**					
a	Displacement or disruption of built heritage resources	L/M/H	Low ▪ 0.5–1m closer to #5418.	Low ▪ 0.5–1m closer to #5418.	Medium ▪ 0.5–1m closer to #5218, #5226, #5236 and #5418.	High ▪ Displaces #5226 building. ▪ 8 m closer to #5218, #5226 and #5236. ▪ 0.5–1m closer to #5418.
2.2	**Cultural Heritage Landscapes (CHL)**					
a	Displacement or disruption of cultural heritage landscapes	L/M/H	Low ▪ No impact to buildings within CHL. ▪ 5m of frontage for 375 m required from #5421 and #5463.	Medium ▪ No impact to buildings within CHL. ▪ 7m and 5 m of frontage for 375 m required from #5421 and #5463, respectively.	Low ▪ No impact to buildings within CHL. ▪ 5 m of frontage for 375 m required from #5421 and #5463.	Low ▪ No impact to buildings within CHL. ▪ 5 m of frontage for 375 m required from #5421 and #5463.
2.3	**Archaeological Resources**					
a	Stage 1 Archaeological Assessment		▪ Existing Dundas Street ROW is disturbed. ▪ Stage 2 archaeological assessment to be undertaken for the undisturbed area at Bronte Creek Provincial Park (200 m west of Tremaine Road) and 4 properties.	▪ Existing Dundas Street ROW is disturbed. ▪ Stage 2 archaeological assessment to be undertaken for the undisturbed area at Bronte Creek Provincial Park (200 m west of Tremaine Road) and 4 properties.	▪ Existing Dundas Street ROW is disturbed. ▪ Stage 2 archaeological assessment to be undertaken for the undisturbed area at Bronte Creek Provincial Park (200 m west of Tremaine Road) and 7 properties.	▪ Existing Dundas Street ROW is disturbed. ▪ Stage 2 archaeological assessment to be undertaken for the undisturbed area at Bronte Creek Provincial Park (200 m west of Tremaine Road) and 6 properties.

n/a – not applicable

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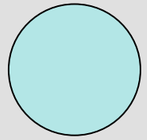
Cultural Environment Summary ***[It should be noted that since the completion of the analysis and evaluation of alternatives in 2010, the heritage features located in the southeast quadrant of Dundas Street / Sutton Drive have since been demolished for future development]***						
			Options 1 and 2 have similar low impacts to Built Heritage Resources, whereas, Option 3 has a slightly higher impact. Option 4 is least preferred since it results in the displacement of 1 built heritage resource, as well as, shifting the proposed ROW approximately 8 m closer to 3 other built heritage resources. Options 1, 2 and 4 have similar impacts to the Cultural Heritage Landscapes, whereas, Option 2 has a slightly higher impact. ***Therefore, Option 1 is preferred from a cultural environment perspective.***			
3.0 Natural Environment						
3.1	**Natural Vegetation**					
a	Impact on upland vegetation considering sensitivity/quality/significance of upland vegetation and relative magnitude of potential effect	L/M/H or ha	Medium Option 1 will primarily result in the removal of Dry-Moist Old-field Meadow (CUM1-1) vegetation from within the existing Dundas Street ROW north of the current alignment. Vegetation within this community is dominated by tolerant grasses and herbs typical of roadside settings in Halton Region, with a high proportion of non-native species. Occasional planted and naturally regenerating shrub and tree species are present within or along the limit of the ROW, however, no specimen trees notable for their size or rarity were noted in this community. Option 1 will also result in the removal from the edge of deciduous forest, cultural woodland, and cultural plantation vegetation communities abutting the existing Dundas Street ROW, including: ▪ Mineral Cultural Woodland (CUW1); ▪ Dry-Fresh White Cedar Mixed Forest (FOM4); ▪ Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3); ▪ Deciduous Forest (FOD); and	High Option 2 will primarily result in the removal of Dry-Moist Old-field Meadow (CUM1-1) vegetation from within the existing Dundas Street ROW north of the current alignment. Vegetation within this community is dominated by tolerant grasses and herbs typical of roadside settings in Halton Region, with a high proportion of non-native species. Occasional planted and naturally regenerating shrub and tree species are present within or along the limit of the ROW, however, no specimen trees notable for their size or rarity were noted in this community. Option 2 will also result in the removal from the edge of deciduous forest, cultural woodland, and cultural plantation vegetation communities abutting the existing Dundas Street ROW, including: ▪ Mineral Cultural Woodland (CUW1); ▪ Dry-Fresh White Cedar Mixed Forest (FOM4); ▪ Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3); ▪ Deciduous Forest (FOD); and	Low Option 3 will primarily result in the removal of Dry-Moist Old-field Meadow (CUM1-1) vegetation from within the existing Dundas Street ROW north and south of the current alignment. Vegetation within this community is dominated by tolerant grasses and herbs typical of roadside settings in Halton Region, with a high proportion of non-native species. Occasional planted and naturally regenerating shrub and tree species are present within or along the limit of the ROW, however, no specimen trees notable for their size or rarity were noted in this community. Option 3 may also result in the removal from the edge of deciduous forest, cultural woodland, and cultural plantation vegetation communities abutting the existing Dundas Street ROW, including: ▪ Mineral Cultural Woodland (CUW1); ▪ Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3); ▪ Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1); ▪ Deciduous Forest (FOD); and	Low Option 4 will primarily result in the removal of Dry-Moist Old-field Meadow (CUM1-1) vegetation from within the existing Dundas Street ROW south of the current alignment. Vegetation within this community is dominated by tolerant grasses and herbs typical of roadside settings in Halton Region, with a high proportion of non-native species. Occasional planted and naturally regenerating shrub and tree species are present within or along the limit of the ROW, however, no specimen trees notable for their size or rarity were noted in this community. Option 3 will also result in the removal from the edge of deciduous forest, cultural woodland, and cultural plantation vegetation communities abutting the existing Dundas Street ROW, including: ▪ Mineral Cultural Woodland (CUW1); ▪ Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1); ▪ Deciduous Forest (FOD); and ▪ Black Walnut Deciduous Plantation (CUP1-3).

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			▪ Black Walnut Deciduous Plantation (CUP1-3). The FOM4, FOD5-3 and CUP1-3 communities are mid-aged to mature with average trees ranging in size from 25-50 cm Diameter at Breast Height (DBH), and occasional trees greater than 50 cm dbh. The CUW1 and FOD communities are young, with average tree size ranging from approximately 10 cm to 20 cm DBH. Portions of these communities that would be affected by removals are in close proximity to the existing Dundas Street ROW and are primarily in poor condition with relatively high abundance of non-native, invasive plant species including Buckthorn and Garlic Mustard, and branch and twig dieback (likely resulting from salt spray). However, there may be some minor encroachment into more intact portions of the communities. Removal of vegetation from the edge of the FOD5-3 community will result in creation of a new forest edge, which may result in increased potential for windthrow, decreased humidity within the forest interior, and increased potential for windborne spread of non-native/invasive plant species into the forest interior. All other treed communities have relatively open canopy structure and are less susceptible to negative impacts associated with creation of a new edge. The removal of upland vegetation required for Option 1 is approximately half as large as that required for Option 2, and therefore the relative magnitude of the potential impact of Option 1 is lower.	▪ Black Walnut Deciduous Plantation (CUP1-3). The FOM4, FOD5-3 and CUP1-3 communities are mid-aged to mature with average trees ranging in size from 25-50 cm Diameter at Breast Height (DBH), and occasional trees greater than 50 cm dbh. The CUW1 and FOD communities are young, with average tree size ranging from approximately 10 cm to 20 cm DBH. Portions of these communities that would be affected by removals are in close proximity to the existing Dundas Street ROW and are generally in poor condition with relatively high abundance of non-native, invasive plant species including Buckthorn and Garlic Mustard, and branch and twig dieback (likely resulting from salt spray). However, this option would also result in removal extending up to approximately 15 m into more intact, less disturbed portions of the affected communities. Removal of vegetation from the edge of the FOD5-3 community will result in creation of a new forest edge, which may result in increased potential for windthrow, decreased humidity within the forest interior, and increased potential for windborne spread of non-native/invasive plant species into the forest interior. All other treed communities have relatively open canopy structure and are less susceptible to negative impacts associated with creation of a new edge. The removal of upland vegetation required for Option 2 is approximately 2 times as large as that required for Option 1, and therefore the relative magnitude of the potential impact of	▪ Black Walnut Deciduous Plantation (CUP1-3). However, the portions of these communities potentially affected by removals are within or immediately adjacent to the existing Dundas Street ROW, and are generally disturbed and of poor quality. More intact, higher quality portions of the communities will not be directly impacted by the potential removals associated with this option. The FOD5-3, FOD5-1 and CUP1-3 communities are mid-aged to mature with average trees ranging in size from 25-50 cm Diameter at Breast Height (DBH). The CUW1 and FOD communities are young, with average tree size ranging from approximately 10 cm to 20 cm DBH. Portions of these communities that would be potentially impacted by removals are in close proximity to the existing Dundas Street ROW, and are generally younger and in poor condition, with more open canopies, lower botanical diversity, a higher proportion of non-native species including Buckthorn and Garlic Mustard, and branch and twig dieback (likely resulting from salt spray). Removals of vegetation from the edge of the forested communities is limited to disturbed portions of the communities and will not likely result in creation of a new forest edge. Thus, the associated potential for negative indirect effects resulting from the creation of new edges can largely be avoided. ***The overall relative potential impact***	However, the portions of these communities potentially affected by removals are within or immediately adjacent to the existing Dundas Street ROW, and are generally disturbed and of poor quality. More intact, higher quality portions of the communities will not be directly impacted by the potential removals associated with this option. The FOD5-1 and CUP1-3 communities are mid-aged to mature with average trees ranging in size from 25-50 cm Diameter at Breast Height (DBH). The CUW1 and FOD communities are young, with average tree size ranging from approximately 10 cm to 20 cm DBH. Portions of these communities that would potentially be impacted by removals are in close proximity to the existing Dundas Street ROW and are generally younger and in poor condition, with more open canopies, lower botanical diversity, a higher proportion of non-native species including Buckthorn and Garlic Mustard, and branch and twig dieback (likely resulting from salt spray). Removals of vegetation from the edge of the forested communities is limited to disturbed portions of the communities and will not likely result in creation of a new forest edge. Thus, the associated potential for negative indirect effects resulting from the creation of new edges can largely be avoided. ***The overall relative potential impact of Option 4 on upland vegetation is considered to be low.***

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			The overall relative potential impact of Option 1 on upland vegetation is considered to be medium.	Option 2 is higher. ***The overall relative potential impact of option 2 on upland vegetation is considered to be high.***	***of Option 3 on upland vegetation is considered to be low.***	
b	Impact to Provincially Significant Wetlands, Locally Significant Wetlands and unevaluated wetland vegetation communities considering sensitivity/quality/significance of wetland vegetation and relative magnitude of potential effect	L/M/H or ha	All will result in the removal of unevaluated wetland vegetation from a disturbed and tolerant meadow marsh community west of the Bronte Creek valley, small areas of Reed Canary Grass (*Phalaris arundinacea*) from the banks of Bronte Creek, and mixed cultural meadow/meadow marsh vegetation (CUM/MAM2) from the tableland east of the Bronte Creek valley. All wetland vegetation communities affected are small in size, are comprised of common and tolerant species, and will likely readily re-establish in temporarily disturbed areas where soil moisture levels allow following completion of construction activities. ***The overall relative potential impact on wetland vegetation is considered to be low.***			
c	Impact to terrestrial species of conservation concern including federally and provincially designated Species at Risk (designated by COSEWIC and COSSARO), including those listed in SARA and ESA as well as provincially ranked (S1-S3) species.	L/M/H or ha	Low No species of conservation concern are known to occur within areas potentially impacted by direct removals.	Low No species of conservation concern are known to occur within areas potentially impacted by direct removals.	Low/Medium Several Butternut trees were previously documented within the CUW1 community on the west valley slope south of the existing Dundas Street ROW. However, these trees were confirmed to be hybrid by the MNR in March, 2010, and are thus not subject to protection and have no legal status under the Endangered Species Act, 2007. Furthermore, based on available location information for these trees, would not likely be directly impacted by removals required for this option.	Low/Medium Several Butternut trees were previously documented within the CUW1 community on the west valley slope south of the existing Dundas Street ROW. However, these trees were confirmed to be hybrid by the MNR in March, 2010, and are thus not subject to protection and have no legal status under the Endangered Species Act, 2007.
d	Impact to Halton Local Status species.	L/M/H or ha	Medium Several regionally rare or uncommon species may also be removed from the FOD5-3, FOD and Bronte Creek valley CUM1-1 communities, however, additional specimens of affected species are present in retained portions of the affected communities. ▪ All species potentially removed are north of Dundas and are associated with the Bronte Creek floodplain and the FOD5-3 unit on the east valley slope. ▪ The floodplain contains: Cow-Parsnip (Heracleum lanatum) - regionally rare in Halton and the GTA ▪ The FOD5-3 unit contains: Round-lobed Hepatica (Anemone americana) and Shagbark Hickory (Carya ovata), and Yellow Pimpernell (Taenidia integerrima) (all Halton regionally uncommon, the hepatica and pimpernell are also rare in GTA) ▪ The FOD5-3 also contains Hairy Beardtongue (Penstemon hirsutus) and Downy Arrow-wood (Viburnum rafinesquianum) (both rare in GTA, no status in Halton). ***Option 1 would likely impact Shagbark Hickory, and may also remove all the other listed species but, given the relatively high level of this assessment, it is***		Low No regionally rare or uncommon species are known to occur within areas potentially impacted by direct removals.	

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			not certain. Option 2 would have a higher likelihood of removing all listed species compared to Option 1.			
3.2	**Fish and Aquatic Habitat**					
a	Effect on fish and fish habitat considering sensitivity and relative magnitude of potential effect	L/M/H	▪ No direct impacts to instream habitat. Indirect impacts including potential for erosion and downstream sediment transport during construction and drainage run-off from new bridges can be managed by standard construction and bridge design mitigation measures, applied at subsequent stages. Given bridge and presence of vegetation along both sides of the Bronte Creek present under the existing bridge, riparian vegetation will be minimally affected by increased overhead shading. ▪ Pier locations associated with all alternatives are depicted as being inline with the existing piers. All piers are located outside of the bankfull channel however, a geomorphic assessment of the proposed pier locations of the preferred option may be warranted in subsequent stages. ▪ Bronte Creek supports a variety of warmwater and coolwater baitfish and sportfish species and provides a migratory corridor/spawning for Lake Ontario Salmonids.			
			Low ▪ Bridge footprint spans a 12m reach upstream of the existing bridge. ▪ Riffle/flat morphology with a narrow pool along east bank. Pier placement- very minimal encroachment into Maple-Oak forest edge (along east bank) and culturally influenced habitat (cultural meadow) along west bank. ***Low potential to impact highly sensitive fish habitat within the crossing. Low potential for impacts to riparian vegetation given the height of the bridge. Implementation of proper mitigation measures will ensure no direct or indirect impacts to fish habitat.***	Medium ▪ Bridge footprint spans a 25m reach upstream of the existing bridge. ▪ Riffle/flat morphology with a narrow pool along east bank. Pier placement- minor encroachment into edge of Maple-Oak forest edge (along east bank) and culturally influenced habitat (cultural meadow) along west bank. ***Medium potential to impact highly sensitive fish habitat than the other options given the substantially longer reach covered by the bridge and the higher potential for impacts to riparian vegetation under the longer bridge.***	Low ▪ Bridge footprint spans a 7m reach upstream of the existing bridge and 5m reach downstream of the existing bridge. ▪ Riffle morphology. Pier placement- very minimal level of encroachment into natural habitat as majority of riparian is already disturbed/culturally influenced. ***Low potential to impact highly sensitive fish habitat within the crossing. Low potential for impacts to riparian vegetation given the height of the bridge. Implementation of proper mitigation measures will ensure no direct or indirect impacts to fish habitat.***	Low ▪ Bridge footprint spans a 12m reach upstream of the existing bridge. ▪ Riffle habitat with a localized scour pool surrounding old (instream) pier. Pier placement-very minimal level of encroachment into natural habitat as majority of riparian already disturbed/ culturally influenced. ***Low potential to impact highly sensitive fish habitat within the crossing. Low potential for impacts to riparian vegetation given the height of the bridge. Implementation of proper mitigation measures will ensure no direct or indirect impacts to fish habitat.***
b	Impact to aquatic species of conservation concern including federally and provincially designated Species at Risk (designated by COSEWIC and COSSARO), including those listed in SARA and ESA as well as provincially ranked (S1-S3) species.	L/M/H	This reach of Bronte Creek has the potential to support Redside Dace (*federally and provincially designated as 'Endangered'*), Silver Shiner (*federally and provincially designated as 'Special Concern'*) and Atlantic Salmon (*provincially designated as 'Extirpated' with recovery efforts underway*). These species are documented in the Tremaine Subwatershed Study (North South Environmental 2008). No direct impacts to potential aquatic species of conservation concern are anticipated with any options. Potential for indirect impacts will be managed through implementation of proper mitigation measures. ***Given that all options span the watercourse, all options have similar low potential for impacts to aquatic SAR. Option 2 is considered to have higher potential for impacts given its substantially longer length. Implementation of proper mitigation measures will ensure no direct or indirect impacts to aquatic SAR.***			
c	Impact on headwater functions and groundwater.	L/M/H	n/a	n/a	n/a	n/a
3.3	**Wildlife**					
a	Impact to terrestrial species of conservation concern including federally and provincially designated Species at Risk (designated by COSEWIC and COSSARO), including those listed in SARA and ESA as well as provincially	L/M/H	The followings species listed under COSSARO have been observed in the immediate study area: Hooded warbler (*Wilsonia citrina*)- Special Concern, Chimney Swift (*Chaetura pelagic*)- Threatened and Common Nighthawk (*Chordeiles minor*)- Special Concern. No species have been documented using the old bridge piers or existing bridges as a nesting sites and no evidence of nesting was noted during 2009 field surveys by LGL Limited. Common nighthawk activity was concentrated in an area of the gravel parking lot on the northwest side of the bridge but the area was observed as being ploughed over later in season. In addition, possible presence of Jefferson Salamander, as salamander breeding habitat has been identified in area, and Jefferson-dominated polyploids (*A.jeffersonianum-laterale*			

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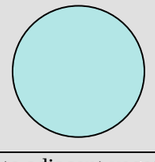
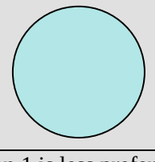
	ranked (S1-S3) species.		complex) as been documented in the tablelands of Bronte Creek. All above information from '**Letter Response to Conservation Halton Comments Burlington-Oakville Interconnecting Watermains- Zone 3 Regional Municipality of Halton).** ***All options have similar low potential for impacts to species of conservation concern. Option 2 has slightly higher potential given that it encroaches slightly more into wooded valley habitat. Potential for construction impacts to breeding birds (on the bridge or in adjacent vegetation) may be mitigated through the implementation of standard measures in accordance with MBCA. Potential for construction impacts to SAR amphibians and reptiles potentially present within the construction area will be considered in the ESR and will be addressed, as appropriate, in ESR recommendations (e.g. how to safely remove these species from within the construction zone, should they be encountered).***			
b	Impact to Halton Local Status species.	L/M/H	A number of wildlife species considered rare or uncommon in Halton Region have been confirmed (by LGL) in the Bronte Creek valley. Potential exists for any number of these species to be present at the Dundas Street crossing (either utilizing habitat adjacent to the bridge or moving through the valley under the bridge). ***All options have similar low potential for impacts to these species. Option 2 has medium potential given that it encroaches slightly more into wooded valley habitat. Potential for construction impacts to breeding birds (on the bridge or in adjacent vegetation) may be mitigated through the implementation of standard measures in accordance with MBCA. Potential for construction impacts to other regionally rare or uncommon species potentially present within the construction area will be considered in the ESR and will be addressed, as appropriate, in ESR recommendations (e.g. how to safely remove these species from within the construction zone, should they be encountered).***			
c	Impact on habitat considering sensitivity and relative magnitude of potential effect	L/M/H or ha	Low/Medium Salamander (species not confirmed) breeding habitat observed approximately 70m north of Dundas Street, and approximately 120m east of Bronte Creek. These alternatives do not directly impact breeding habitat. These options result in minor encroachment into potential hibernation habitat (valley on north-east side of Bronte Creek bridge) and ***therefore low potential for impacts to wildlife habitat. Option 2 has slightly higher potential for impacts to potential breeding habitat given that it encroaches slightly more into wooded valley habitat***		Low Salamander (species not confirmed) breeding habitat observed approximately 70m north of Dundas Street, and approximately 120m east of Bronte Creek. Very minimal encroachment into potential hibernation habitat (valley on north-east side of Bronte Creek bridge) and ***therefore low potential for impacts to wildlife habitat.***	Low Very minimal encroachment into potential hibernation habitat (valley slopes) and ***therefore low potential for impacts to wildlife habitat.***
3.4	**Designated natural environment features/areas**					
a	Impact on Areas of Natural and Scientific Interest (ANSI), Environmentally Sensitive Areas (ESAs), Greenbelt Plan, Niagara Escarpment Plan etc.	L/M/H or ha	Bronte Creek valley and tablelands north and south of Dundas Street are considered part of the Regional Greenlands System as well as the Bronte Creek Valley ESA. All options will expand the existing crossing of the Greenlands System and ESA. The sensitive vegetation, wildlife and aquatic communities for which these areas have been designated, are covered under the headings further above.			
			n/a		Bronte Creek valley and tablelands south of Dundas Street are designated as a Life Science ANSI (Bronte Creek Provincial Park Nature Reserve zone). The options that widen to the south will result in slight encroachment into the ANSI and Provincial Park Nature Reserve Zone. The sensitive vegetation, wildlife and aquatic communities for which these areas have been designated, are covered under the headings further above.	
3.5	**Stormwater Management**		Stormwater management and drainage analysis will be completed during the detailed assessment and evaluation of alternatives.			
Natural Environment Summary						
			Options 3 and 4 are preferred from a vegetation perspective because they result in low impacts to adjacent vegetation communities. Option 1 is less preferred due to			

Factor/Criteria		Measures	OPTION 1 (Widen Tansley Bridge – 2 lanes to the north)	OPTION 2 (Widen Tansley Bridge – 4 lanes to the north)	OPTION 3 (Widen Tansley Bridge – maintain existing centreline)	OPTION 4 (Widen Tansley Bridge – 2 lanes to the south)
			impacts to regionally rare plants located on the north side of the bridge. Option 2 is least preferred due to a higher likelihood of removing more regionally rare plant species compared to Option 1, 3 or 4. All options are similar from a fisheries perspective as all have low potential to impact highly sensitive fish and fish habitat (including potential SAR habitat). Option 2 is the least preferred from a fisheries perspective since the bridge would cover a longer reach of watercourse, increasing the potential for shading impacts to riparian vegetation. All options are similar from a wildlife and habitat perspective as all have low potential to impact wildlife species (including species of conservation concern) and their habitat. Option 2 is however less preferred as it results in increased encroachment in wooded valley vegetation compared to the other options. ***Therefore, Options 3 and 4 are both preferred from a natural environment perspective.***			
4.0 Transportation						
4.1	**Operating level of service**					
a	Future peak period level of service provided	Level of Service	For all alternatives, the future peak period level of service will be similar.			
4.2	**Road Safety**					
a	Coordination of horizontal and vertical alignments		Similar for all alternatives.			
4.3	**Intersections/Interchanges**					
a	Provision of auxiliary lane requirements		Similar for all alternatives.			
b	Proximity to other accesses / entrances	Good/Fair/Poor	Good Separation between the approved public school plan driveway on Sutton Drive and the Dundas Street intersection remains the same as the approved site plan – 70m.	Good Separation between the approved public school plan driveway on Sutton Drive and the Dundas Street intersection is extended by 10m.	Fair Separation between the approved public school plan driveway on Sutton Drive and the Dundas Street intersection is reduced by 10m.	Fair Separation between the approved public school plan driveway on Sutton Drive and the Dundas Street intersection is reduced by 10m.
4.4	**Structural Maintenance**					
a	Extent of maintenance required.	L/M/H	Similar for all alternatives			
4.5	**Structure Aesthetics (Visual Impact)**					
a	At road level		Similar for all alternatives, subject to aesthetic treatment of barriers.			
b	At valley level	L/M/H	Uniform appearance and homogeneity of piers			
4.6	**Compliance with appropriate design criteria**					
a	Adherence to roadway design standards		All alternatives meet or exceed minimum design standards.			
b	Adherence to structural design standards	Good/Fair/Poor	Surplus capacity and relative ease to strengthen by post-tensioning methods.			
4.7	**Construction Staging**					
a	Constructability issues (Tansley Bridge)	Good/Fair/Poor	Fair Traffic staging manageable.	Good Minimal impact to traffic during construction.	Poor Probable reduction to single lane each direction during construction.	Fair Traffic staging manageable.
4.8	**Utilities**					
a	Impact on existing utilities	L/M/H	For all alternatives, relocation of existing utilities will be similar.			
b	Impact on existing utilities along structures	L/M/H	Relocation of existing ducts required.			
c	Impact on future utilities	L/M/H	Low No conflict with proposed watermain / pipe bridge.	Low No conflict with proposed watermain / pipe bridge.	Medium Pipe bridge would have to be deflected at Pier 3 to maintain adequate	High Proposed bridge would conflict with Piers 1-4 and pipe bridge would not be

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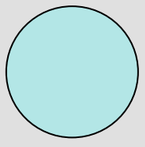
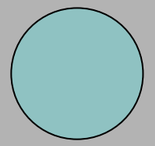
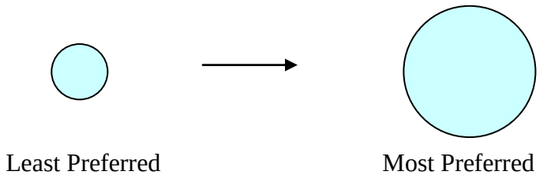
			clearance from proposed bridge. As a result, the pipe bridge would span from Pier 3 to the east abutment (i.e. Pier 4 would not usable). Construction cost would be slightly higher than Options 1 & 2 due to longer span between Pier 3 and the east abutment. Additional property / larger easement would have to be acquired from Bronte Creek Provincial Park to accommodate proposed east abutment. Construction of proposed watermain would be delayed by several months in order to complete Class EA study; acquire property / easements; and obtain approvals.			feasible. As a result, it would be necessary to construct the watermain in a tunnel under the Bronte Creek valley. Permanent easement would have to be acquired from Bronte Creek Provincial Park for tunnel and a temporary easements would be required for working areas around tunnel shafts. Potential impacts on natural heritage (e.g. removal of trees) within working areas around tunnel shafts. Construction of proposed watermain would be delayed by 1-2 years in order to complete Class EA study; acquire property / easements; and obtain approvals.
4.10	**Preliminary Cost Estimate**					
a	Preliminary roadway construction cost	$	Similar for all alternatives - to be completed during the detailed assessment and evaluation of alternatives .			
b	Preliminary structures construction cost	$	~$30-35 M			
c	Annual structures maintenance cost	$/yr	~$40,000			
d	Preliminary utility relocation cost	$	To be completed during the detailed assessment and evaluation of alternatives.			
e	Additional Watermain Cost	$	-	-	-	~$3 M (to tunnel the watermain)
f	Preliminary property cost	$	To be completed during the detailed assessment and evaluation of alternatives.			
Transportation Summary						
			Options 3 and 4 are least preferred as they both result in impact to the proposed watermain. In addition, Option 4 would result in the need to tunnel the watermain, which would increase the construction cost of the watermain by approximately $3 M, as well as, delay completion of the watermain. From a construction staging perspective, Option 3 results in more staging complexities and therefore significant impact on traffic, in that it may require the reduction of Dundas Street to a single lane in each direction during construction. Through input from the Region it was advised that reduction to 1 lane in each direction for extended periods of times was not acceptable and could not be considered. It was agreed that this alternative would require overbuilding the structure to the north to allow for four lanes of traffic while the south structure is being constructed. However, overbuilding the north structure would be potentially more costly and the impacts to the north would be similar to Option 1. Options 1 and 2 are similar from other transportation perspectives, with Option 2 slightly preferred. Option 2 would allow for the existing Tansley Bridge to be		

Factor/Criteria	Measures	OPTION 1 (Widen Tansley Bridge – 2 lanes to the north)	OPTION 2 (Widen Tansley Bridge – 4 lanes to the north)	OPTION 3 (Widen Tansley Bridge – maintain existing centreline)	OPTION 4 (Widen Tansley Bridge – 2 lanes to the south)
		maintained during the construction of the 4 lanes to the north. ***Therefore, Option 2 is preferred from a transportation perspective.***			
Overall Summary					
		Option 4 is not preferred because it results in the highest impact to the Socio-Economic Environment and Cultural Environment as it results in the displacement of 1 house, which is identified as a Built Heritage Resource. In addition, Option 4 is least preferred from a transportation perspective due to its potential impact on the proposed watermain. This impact may result in the need to tunnel the watermain, which would increase the construction cost of the watermain by approximately $3 M. When comparing Options 1 and 3, both alternatives results in similar low impacts to both the Socio-Economic Environment and Natural Environment although Option 3 is slightly more preferred. However, from a transportation perspective, Option 3 is less desirable as it requires overbuilding the structure to the north to allow for four lanes of traffic while the south structure is being constructed. Overbuilding the north structure would be potentially more costly and the impacts to the north would be similar to Option 1. In addition, Option 3 impacts the proposed watermain. As a result, Option 3 is not preferred. When comparing Options 1 and 2, both alternatives have similar low impacts to the Cultural Environment. In addition, Options 1 and 2 are preferred from a transportation perspective although Option 2 is slightly more preferred. However, Option 2 has a high impact on both the Socio-Economic Environment (displacement of a Self-Service Car Wash) and Natural Environment. As a result, Option 2 is not preferred. Overall, Option 1 is the preferred alternative as it would achieve an acceptable balance between the Socio-Economic, Cultural, Natural Environment and Transportation factors. Whereas, Options 2, 3 and 4 are all significantly less desirable from either a Socio-Economic Environment, Cultural Environment, Natural Environment or Transportation perspective. ***Therefore, in considering all factors in combination Option 1 is preferred over the other alternatives.***		



n/a – not applicable