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Central Brampton

Appendix K

Phase 2 Evaluation: Short-list Route Evaluation Matrices

AECOM

Peel Region

Kennedy Road Sanitary Trunk Sewer EA

1. Evaluation of South and North Short-listed Routes

A comparative evaluation has been completed for the alternative solutions using the established criteria and were rated based on their potential constraints relative to the other alternatives as follows:

- High Constraints (Least Preferred)
- Medium Constraints (Less Preferred)
- Low Constraints (Preferred)

Table 1 and **Table 2** detail the comparative evaluation of the alternatives. The evaluation is qualitative in nature and has been informed through documentation of existing conditions and analysis by discipline leads.

Evaluation Methodology:
This evaluation will not be based on a weighted numerical ranking system but rather the professional expertise of the project team. To ensure statistical validity, such an approach would have to strictly adhere to statistical methods that are often difficult to apply in a multi-faceted project such as a Municipal Class EA. Instead, a descriptive or qualitative evaluation was used to consider the suitability and feasibility of each alternative route. In this respect, trade-offs were made considering the advantages or disadvantages of each alternative to address the problem and opportunity statement, with the least environmental effects and the most technical benefits resulting in a higher priority and forming the rationale for the preferred route.

Construction Methodology:
Due to the depth and size of the trunk sewer, trenchless construction was selected over open-cut construction and was considered during the Phase 2 of the EA process. While the specific trenchless technology (e.g., TBM, micro-tunneling) will be determined in Phase 3 of the EA process, the decision to use a trenchless approach was made in advance based on these factors.

Table 1: Evaluation of Alternatives – South-listed Routes

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
Description of Alternative	-	-	Route S1 follows Kennedy Road, including Bovaird Drive. Route has an approximate length of 9.5 km.	Route follows Kennedy Road, including Vodden Street and Orangeville-Brampton Railway. Route has an approximate length of 8.7 km.
Natural Environment	Potential effects on water resources	▪ Disruption to fish including spawning periods and physical changes to aquatic habitat (e.g., number and type of watercourse crossings) ▪ Anticipated amount of groundwater management (e.g., potential short-term water taking)	**Low Constraints** ▪ A total of five (5) fish-bearing watercourses were identified within 120 metres of Route S1. ▪ Less groundwater management related to less construction within floodplains **Route S1 has three (3) fewer fish-bearing watercourses, and less groundwater management compared to Route S2. This Route has the potential to negatively impact Fletchers Creek which is a Redside Dace Critical Habitat at Bovaird Drive West, east of McLaughlin Road.**	**Medium Constraints** ▪ A total of eight (8) fish-bearing watercourses were identified within 120 metres of Route S2, some of which cross the route multiple times. ▪ Slightly more groundwater management complexity related to more construction in TRCA regulated areas **Route S2 has three (3) more fish bearing watercourses, and slightly more groundwater management compared to Route S1. This Route has the potential to negatively impact Fletchers Creek which is a Redside Dace Critical Habitat at Bovaird Drive West, east of McLaughlin Road.**
Natural Environment	Potential effects on terrestrial features	▪ Loss of or disruption to sensitive species habitat and natural heritage features (e.g., significant wetlands and woodlands, significant wildlife habitats [SWH], proximity to provincially or locally/regionally rare amphibians, birds or wildlife)	**Low Constraints** ▪ The following natural heritage features are located within 120m of the S1 Route and may be indirectly affected via trenchless methods: o No Provincially Significant Wetlands o Ontario Greenbelt Urban River Valley: Two (2) crossings o Number of Woodlands[1]: Five (5) o City of Brampton Natural Heritage System: Two (2) crossings ▪ Candidate SWH: Bat Maternity Colony, Amphibian Breeding Habitat Woodland and several habitats for Species Of Conservation Concern ▪ The following natural heritage features are located along the S1 route that may be directly (i.e., loss of vegetation) or indirectly affected: o No wetlands o Number of Woodlands: Four (4) o City of Brampton NHS: Two (2) o Ontario Greenbelt Urban River Valley: Two (2) **Minimal loss of vegetation or disruption to sensitive habitats is anticipated along both Route S1 and S2 as the majority of the route will be installed via trenchless methods, with direct impacts limited to exit and entrance shafts, which are largely outside of natural heritage features.**	**Low Constraints** ▪ The following natural heritage features are located within 120m of the S2 Route and may be indirectly affected via trenchless methods: o No Provincially Significant Wetlands o Ontario Greenbelt Urban River Valley: Two (2) crossings o Number of Woodlands[2]: Five (5) o City of Brampton Natural Heritage System: Two (2) crossings ▪ Candidate SWH: Bat Maternity Colony, Amphibian Breeding Habitat Woodland and several habitats for Species Of Conservation Concern ▪ The following natural heritage feature are located along the S2 route that may be directly (i.e., loss of vegetation) or indirectly affected: o No wetlands o Number of Woodlands: Four (4) o City of Brampton NHS: Two (2) o Ontario Greenbelt Urban River Valley: Two (2) **Minimal loss of vegetation or disruption to sensitive habitats is anticipated along both Route S1 and S2 as the majority of the route will be installed via trenchless methods, with direct impacts limited to exit and entrance shafts, which are largely outside of natural heritage features.**

[1] Woodland areas are considered to be a generally continuous feature even if intersected by narrow gaps of 20 m or less in width.
[2] Woodland areas are considered to be a generally continuous feature even if intersected by narrow gaps of 20 m or less in width.

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
Natural Environment	Potential effects on Species at Risk (SAR) and SAR habitat	▪ Loss of or disruption/disturbance to SAR or their habitats affecting the species ability to carry out its critical life processes in the local area.	**Low Constraints** ▪ The following twelve (12) SAR may occur within 120m of Route S1 and may be indirectly affected via trenchless methods: ○ Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-coloured Bat (*Perimyotis subflavus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*Lasiurus borealis*), Chimney Swift (*Chaetura pelagica*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Butternut (*Juglans cinerea*), and Black Ash (*Fraxinus nigra*) ○ Redside Dace (*Clinostomus elongatus*) ▪ The following one (1) SAR may occur along the route that may be directly (i.e., loss of vegetation) or indirectly affected: ○ Redside Dace ▪ Route is located predominately in urban developed areas. Tree removal in woodlots may occur for any work within the treed valleyland of Etobicoke Creek valley. **Similar impacts on SAR and SAR habitat**	**Low Constraints** ▪ The following twelve (12) SAR may occur within 120m of Route S2 and may be indirectly affected via trenchless methods: ○ Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Chimney Swift, Red-headed Woodpecker, Butternut, and Black Ash ○ Redside Dace ▪ The following one (1) SAR may occur along the route that may be directly (i.e., loss of vegetation) or indirectly affected: ○ Redside Dace ▪ Route is located predominately in urban developed areas. Tree removal in woodlots may occur for any work within the treed valleyland of Etobicoke Creek valley. **Similar impacts on SAR and SAR habitat**
Natural Environment	Potential effects on soil and groundwater	▪ Potential to encounter soil and groundwater contamination and ability to mitigate	**Low Constraints** ▪ Envision's Contaminants Overview Study identified several Potential Contaminating Activities and Areas of Potential Environmental Concern (e.g. autobody and/or auto service garages, gasoline service stations) along Kennedy Road route section. ▪ Route was not subject to Phase 2 Environmental Site Assessment –lower potential for soil contaminants and groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered lower, compared to Route S2 (will be confirmed through additional investigation Due Diligence Risk Assessment focussed on shaft compounds in the Preliminary Design Phase) ▪ Soil contamination mitigation strategies will address any risks with contaminated soil and groundwater.	**Medium Constraints** ▪ Envision's Contaminants Overview Study identified several Potential Contaminating Activities and Areas of Potential Environmental Concern (e.g. autobody and/or auto service garages, gasoline service stations) along Kennedy Road route section. ▪ Collected soil samples (WSP Phase 2 Environmental Site Assessment) within Orangeville-Brampton Railway (Vodden Street to Bovaird Drive) do not meet applicable MECP Table 1 Site Conditions for several contaminants including Polycyclic Aromatic Hydrocarbons and Petroleum Hydrocarbons among others - Applies to Orangeville-Brampton Railway shaft compounds (requires additional evaluation through Due Diligence Risk Assessment). This will be an issue at the shaft sites. ▪ There is a known risk of soil and groundwater contamination at shaft and compound locations which can be mitigated using soil management and stormwater management techniques and will requires additional evaluation through Due Diligence Risk Assessment focused on shaft compounds).

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			From a soil and groundwater contamination perspective, Route S1 is preferred as it has less areas of potential contamination in comparison to the Orangeville Bampton Railway corridor from Vodden Street to Bovaird Drive.	▪ Remainder of route (i.e. Kennedy Road) was not subject to Phase 2 Environmental Site Assessment –lower potential for soil contaminants and groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered lower, compared to portion along Orangeville-Brampton Railway (will be confirmed through additional investigation Due Diligence Risk Assessment focussed on shaft compounds in the Preliminary Design Phase) ▪ Soil contamination mitigation strategies will address any risks with contaminated soil and groundwater. **From a soil and groundwater contamination perspective, Route S2 is less preferred as it uses the Orangeville Bampton Railway corridor from Vodden Street to Bovaird Drive which will require more rigorous measures to address soil and groundwater contamination compared to Route S1.**
Natural Environment	**Evaluation Ranking**		**Route S1 is preferred from overall Natural Environment perspective.**	
Socio-Economic Environment	Number of potentially impacted sensitive receptors* during construction and potential for increased noise, dust and vibration and reduced property access and potential business losses related to customers avoiding trips to high traffic commercial areas * Receptors refers to people, places, or things that could be affected by impacts from construction	▪ Schools ▪ Daycares ▪ Hospitals and emergency services ▪ Nursing homes ▪ Long-term care facilities ▪ Places of worship ▪ Recreational facilities and community centres ▪ Parks ▪ High traffic commercial areas ▪ Libraries ▪ Cemeteries	**Medium Constraints** **Notable Sensitive Receptors along Route S1 include:** ▪ Temporary disruption to Sam Rayson Valley Hiking Trail (Etobicoke Creek Trail) access ▪ Turner Fenton Secondary School (7935 Kennedy Road South) ▪ Ken Giles Recreation Centre (370 Bartley Bull Parkway) ▪ Masjid E-Aqsa – Place of Worship (30 Rambler Drive) ▪ Sir Wilfrid Laurier Public School (364 Bartley Bull Parkway) ▪ Alectra Corporate Office and Works Yard (200 Kennedy Road South) ▪ Nursing Home: Tullamore Care Community (133 Kennedy Road South) ▪ Kennedy Square Mall (50 Kennedy Road South) ▪ Central Peel Secondary School (32 Kennedy Road North) ▪ Centennial Mall (227 Vodden Street East) ▪ Kennedy Road Tabernacle Pentecostal Church (141 Kennedy Road North) ▪ Brampton Kennedy Road YMCA Child Care Centre (9996 Kennedy Road North) ▪ Kingdom Hall of Jehovah's Witnesses (360 Conestoga Drive)	**Low Constraints** **Notable Sensitive Receptors along Route S2 include:** ▪ Temporary disruption to Sam Rayson Valley Hiking Trail (Etobicoke Creek Trail) access ▪ Turner Fenton Secondary School (7935 Kennedy Road South ▪ Ken Giles Recreation Centre (370 Bartley Bull Parkway), ▪ Masjid E-Aqsa (30 Rambler Drive) ▪ Sir Wilfrid Laurier Public School (364 Bartley Bull Parkway) ▪ Alectra Corporate Office and Works Yard (200 Kennedy Road South) ▪ Nursing Home: Tullamore Care Community (133 Kennedy Road South) ▪ Kennedy Square Mall (50 Kennedy Road South) ▪ Central Peel Secondary School (32 Kennedy Road North) ▪ Centennial Mall (227 Vodden Street East) ▪ St. Anne Elementary School (124 Vodden Street East) ▪ St. Anne's Roman Catholic Church (115 Vodden Street East) ▪ Brampton Fire Station 207 (75 Vodden Street East) ▪ Duggan Park (75 Vodden Street East) ▪ Vodden Medical Arts Centre (36 Vodden St E)

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			▪ Dexfield Park (address not available) ▪ Temporary disruption to Wegenast Valley Hiking Trail (Etobicoke Creek Trail) access ▪ Rowntree Montessori School (3 Sunforest Drive) ▪ Brampton Corners Commercial Centre (52 Quarry Edge Drive) **Seventeen (17) sensitive receptors are impacted along Route S1, however, anticipate potential impacts to Brampton Corners Commercial Centre around Bovaird Drive and Hurontario Street and potential business losses related to customers avoiding trips to high traffic commercial areas. Common to both Routes is the Kennedy Square Mall which may experience potential business losses.**	▪ Vodden Park (96 Vodden Street West) ▪ Nancy McCredie Park playground ▪ Fred Kee Park (95 Royal Orchard Drive) ▪ St Maria Goretti Elementary School (121 Royal Orchard Drive) **Slightly higher number of sensitive receptors (19) are impacted along Route S2. Common to both Routes is the Kennedy Square Mall which may experience potential business losses.**
Socio-Economic Environment	Traffic and active transportation impacts during construction, including expected lane, sidewalk, trails, and bike lane closures	▪ Expected number/direction/duration of open lanes during construction and reduction in the number of intersecting roads affected by shaft locations ▪ Potential for increased public scrutiny related to inconvenience of higher traffic volumes/closures ▪ Opportunities to enhance active transportation	**Medium Constraints** ▪ Route impacts vehicle traffic along Kennedy Road, a 4-lane Major Arterial City/Regional roadway (longer segment impacted compared with N2) ▪ Route impacts vehicle traffic along Bovaird Drive. Higher traffic volumes on Kennedy Road and Bovaird Drive and therefore greater potential for public scrutiny/complaints ▪ Shaft locations potentially impact 3 crossing roads where S1 intersects Regional or City roadways: ○ Bovaird Drive is a 6-lane Major Arterial Roads (Regional) and Rapid Transit corridor ○ Main Street is a 4-lane Major Arterial Roads (City) and Rapid Transit corridor ○ Williams Parkway is a 4-lane Minor Arterial Road (City) and transit corridor ▪ Potentially increases delay to 5 crossing roads where S1 intersects City roadways (where S1 and S2 routes differ): ○ Access from other crossing roads to Kennedy Road will also be impacted by lane closure on Kennedy Road: Rutherford Road, Linkdale Road ○ Access from other crossing roads to Bovaird Drive will also be impacted by lane closure on Bovaird Drive: Conestoga Road, Sunforest Drive/YellowBrick Road, Gillingham Drive ▪ Limited opportunity for active transportation enhancements on this route **From a traffic and active transportation perspective, Route S1 is less preferred as there are more traffic impacts related to higher traffic volumes and anticipated 2-lane closures on Kennedy Road and**	**Low Constraints** ▪ Orangeville-Brampton Railway alignment avoids or minimizes lane closures ▪ High traffic volumes on Kennedy Road ▪ Route impacts vehicle traffic along Vodden Street, a 2-lane Collector Roadway (City owned) with relatively lower traffic volumes and potentially lower public complaints. ▪ Shaft locations potentially impact 1 crossing road where S2 intersects a City roadway: ○ Williams Parkway is a 4-lane Minor Arterial Road (City) and transit corridor ▪ Potentially increases delay to 9 crossing roads (primarily residential low-volume roads) where S2 intersects City roadways (where S1 and S2 routes differ): ○ Main Street is a 4-lane Major Arterial Roads (City) and Rapid Transit corridor ○ Access from other crossing roads to Vodden Street will also be impacted by lane closure on Vodden Street: Post Road, Centre Street, Garfield Crescent, Vodden Court/Cumberland Drive, Cheryl Court, Isabella Street, Blossom Avenue, Mill St/Rosebud Avenue ▪ Opportunity to enhance active transportation related to development of a future multi-use trail along the Orangeville-Brampton Railway corridor from Vodden Street to Bovaird Drive **From a traffic and active transportation perspective, Route S2 is preferred as there are fewer lane closures anticipated along this route (2-lane closures on Kennedy Road and 1-lane closure on Vodden Street). There are also more opportunities to**

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			Bovaird Drive and limited opportunities to enhance active transportation	**enhance active transportation related to future Orangeville-Brampton Railway multi use trail**
Socio-Economic Environment	Potential impacts on public transit during construction, including bus stop closure/relocation	▪ Relocation of bus shelters and transit stops ▪ Temporary service interruptions ▪ Consideration of higher order transit routes	**Medium Constraints** ▪ Impacts Rapid Transit Corridor on Bovaird Drive and Main Street which are higher order transit routes ▪ Impacts transit corridor: Kennedy Road (longer section impacted compared to S2) ▪ Potential relocation of bus shelters and transit stops along Kennedy Road (1 more location compared to S2) **More impact to bus shelters and transit stops compared to S2**	**Low Constraints** ▪ Impacts rapid transit corridors on Kennedy Road. ▪ Potential relocation of bus shelters and transit stops along Kennedy Road and Vodden Street ▪ Potentially introduces delays to transit corridor at route crossing of Main Street ▪ Avoids relocation of transit infrastructure along the Orangeville-Brampton Railway corridor, where no existing transit stops **Avoids impacts to higher order transit routes (e.g., Bovaird Drive) and may result in less impacts to bus shelters and transit stops**
Socio-Economic Environment	Potential impacts on agricultural operations	▪ Impacts on Canada Land Inventory Class 1-3 prime agricultural lands	**Low Constraints** ▪ No impacts on Class 1-3 Prime Agricultural Lands as study area is highly urbanized with no agricultural land or operations **No impacts on agricultural operations**	**Low Constraints** ▪ No impacts on Class 1-3 Prime Agricultural Lands as study area is highly urbanized with no agricultural land or operations **No impacts on agricultural operations**
Socio-Economic Environment	Evaluation Ranking			**Route S2 is preferred from an overall Socio-economic Environment perspective.**
Cultural Environment	Potential for loss and/or disturbance to potential archaeological resources	▪ Loss of or destruction of significant cultural heritage resources and archaeological sites including burial sites	**Medium Constraints** ▪ Low to no archaeological potential along existing paved roads due to previous disturbance. ▪ Moderate to high archaeological potential for most areas outside of the paved roadway. Highest potential near water bodies and water courses. Stage 2 archaeological investigations required for all undisturbed lands, including tunnel shaft location areas. ▪ Graham East Cemetery/Graham West Cemetery located at First Gulf Road and Kennedy Road **Similar impacts from an archaeological perspective due to the proximity to the Graham East/Graham West Cemetery.**	**Medium Constraints** ▪ Low to no archaeological potential along existing paved roads and former railway corridor due to previous disturbance. ▪ Moderate archaeological potential for most areas outside of the paved roadway and former railway corridor due to being in highly urbanized area. Highest potential near water bodies and water courses. Stage 2 archaeological investigations required for all undisturbed lands, including tunnel shaft location areas. ▪ Graham East Cemetery/Graham West Cemetery located at First Gulf Road and Kennedy Road **Similar impacts from an archaeological perspective due to the proximity to the Graham East/Graham West Cemetery.**
Cultural Environment	Potential effects on built heritage resources and cultural heritage landscapes.	▪ Loss of or disruption to built heritage resources and cultural heritage landscapes (e.g. loss of a historic farmhouse or significant disruption of agricultural lands of a historic farmstead)	**Low Constraints** ▪ The only known cultural heritage resource that is adjacent to Route S1 is Kennedy Valley (Listed). Since no structures are located within this cultural heritage resources, no indirect adverse impacts due to construction vibration are anticipated.	**Low Constraints** ▪ The only known cultural heritage resource that is adjacent to Route S2 is the Ontario Heritage Plaque “The Dale Estate” in Duggan Park. Since no historical structures are located within the property, no indirect adverse impacts due to construction vibration are anticipated.

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			Similar impacts on cultural heritage resources	**Similar impacts on cultural heritage resources**
Cultural Environment	Evaluation Ranking		**Both Routes score equal from an overall Cultural Environment perspective**	**Both Routes score equal from an overall Cultural Environment perspective**
Legal/Jurisdictional	Compliance with applicable planning policies	▪ Potential conflicts with Peel Region, Town of Caledon, and City of Brampton Official Plan policies, including Secondary Plans, Master Servicing Plans and Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) regulations	**Low Constraints** ▪ Compliant – no issues (supports planned growth) ▪ Complies with regional public works policies to locate large diameter infrastructure within major arterial roads ▪ Similar amount of construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas **Similar amount of construction within regulated areas**	**Low Constraints** ▪ Compliant – no issues (supports planned growth) ▪ Complies with regional public works policies to locate large diameter infrastructure within major arterial and local collector roads ▪ Similar amount of construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas **Similar amount of construction within regulated areas**
Legal/Jurisdictional	Land requirements	▪ Number of temporary and/or permanent easements	**Low Constraints** ▪ No permanent easement identified for sanitary trunk sewer at this time as it is assumed that the new sewer will be constructed with the road right-of-way. ▪ Permanent easements will be required for connections to the existing Etobicoke Creek and Fletcher's Creek sanitary trunk sewers. **Similar impacts from land requirement perspective**	**Low Constraints** ▪ No permanent easement identified for sanitary trunk sewer at this time as it is assumed that the new sewer will be constructed with the existing road right-of-way or utility corridors. ▪ Permanent easements will be required for connections to the existing Etobicoke Creek and Fletcher's Creek sanitary trunk sewers. **Similar impacts from land requirement perspective**
Legal/Jurisdictional	Evaluation Ranking		**Both Routes score equal from a Legal/Jurisdictional perspective**	**Both Routes score equal from a Legal/Jurisdictional perspective**
Technical Environment	Constructability	▪ Right-of-way width, ▪ length of pipe, ▪ Sewer/shaft depth ▪ Construction methodology, ▪ significant major infrastructure crossings ▪ shaft locations (e.g., in travelled section of ROW vs. outside of travelled section of ROW)	**High Constraints** ▪ Bovaird ROW is 50 metres wide ▪ The route length is approximately 9 km along Kennedy from the south connection point at Etobicoke Creek to/and along Bovaird to the Orangeville-Brampton Railway. ▪ Depth of the proposed Sanitary Trunk Sewer is much deeper and in the range of 10m to 30m. ▪ Trenchless construction methodology will be required. ▪ Connections to existing Sanitary Trunk Sewer and sub-trunks will use open-cut construction method. ▪ Shaft and connection to existing and proposed twinning of Etobicoke Creek Sanitary Trunk Sewer will be installed inside travelled section of roadway as per current detailed design drawings ▪ Majority of shafts on Bovaird Drive can be installed outside the travelled section of roadway and still within existing ROW, with the exception of shaft at Bovaird Drive and Kennedy Road.	**Low Constraints** ▪ Vodden ROW width ranges from 20 to 33 metres ▪ Rail Corridor = 20m ▪ The route length is approximately 9 km along Kennedy from the south connection point at Etobicoke Creek to/and along Vodden Rd, then along the Orangeville Bampton Railway corridor up to Bovaird. ▪ The depth of the Sanitary Trunk Sewer is much shallower and in the range of 15-20m in some areas ▪ Trenchless construction methodology will be required. ▪ Connections to existing Sanitary Trunk Sewer (STS) and sub-trunks will use open-cut construction method. ▪ Shaft and connection to existing and proposed twinning of Etobicoke Creek STS will be installed inside travelled section of roadway as per current detailed design drawings ▪ Shaft and connection to existing Etobicoke Creek Sanitary Trunk Sewer will be installed outside travelled section of roadway on Vodden Street utilizing existing ROW

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			Route S1 is less preferred due to significantly deeper shafts compared to Route S2 which increases construction duration (e.g., increases duration of noise and dust exposure), cost and will increase time spent accessing the sewer for operations and maintenance staff.	**Route S2 is preferred due to significantly shallower shafts compared to Route S1**
Technical Environment	Permits and approvals	▪ Complexity and duration to obtain the necessary permits and approvals (e.g., MTO/CNR/ Metrolinx and TRCA/CVC permits for work in regulated areas) ▪ Road ownership/occupancy permits	**Medium Constraints** ▪ Similar for both alternatives (requires CN/Metrolinx, TRCA, no MTO or CVC approvals) ▪ Kennedy Road south of Steeles Avenue is City of Brampton's jurisdiction (common to both routes) ▪ Remainder of Kennedy Road/Bovaird Drive are Regional roads **Maximizes the use of regional roads, however it would still require Road Occupancy Permits from the Region, which would be similar to obtaining Road Occupancy Permits from the City**	**Medium Constraints** ▪ Similar for both alternatives (requires CN/Metrolinx, TRCA, no MTO or CVC approvals) ▪ Kennedy Road south of Steeles Avenue is City of Brampton's jurisdiction (common to both routes) ▪ Kennedy Road north of Steeles Avenue is a Regional road ▪ Vodden Street from Kennedy Road to Orangeville-Brampton Railway is City of Brampton jurisdiction **Requires more construction within City of Brampton roads, but it would be similar level of efforts to obtain road occupancy permits as Route S1**
Technical Environment	Connection points to existing and future STSs and sub-trunks	▪ Ability to optimize connections to free up capacity in the existing system	**Medium Constraints** ▪ Connections on Bovaird are expected to pick up less volume of flow upstream thereby freeing up less capacity in the existing wastewater system for future MajorTransit Station Areas (MTSA) 2. **Bovaird Drive alignment is less effective at freeing up capacity at MTSA 2 area.**	**Low Constraints** ▪ Connection points on Vodden are expected to intercept a greater volume of flow than S1, thereby freeing up more capacity for future MTSA2. **Vodden Street alignment is more effective at freeing up capacity at MTSA 2 area.**
Technical Environment	Operations and maintenance	▪ Accessibility to maintenance chambers sites and sewer pipes	**Medium Constraints** ▪ Bovaird ROW heavily travelled but boulevards are wide potentially allowing access to shafts with minimal traffic management planning and setup. ▪ Shafts/chambers are deeper and thus more difficult to maintain **Both Routes score equally from operations and maintenance perspective**	**Medium Constraints** ▪ Vodden Street portion ROW is not as heavily travelled or as wide as Bovaird Drive therefore access to shafts may require Traffic Management Plans (TMPs) and additional setup. Lane closure maybe required to access chambers for maintenance ▪ Shafts/chambers are less deep and thus facilitates easier for maintenance. **Both Routes score equally from operations and maintenance perspective**
Technical Environment	Conflicts with existing utilities	▪ Significance of existing utilities and infrastructure and ability to maintain existing services or relocate existing utilities	**Low Constraints** ▪ More space to implement potential relocations of near-surface utilities at shaft locations ▪ Significant storm sewer infrastructure at Queen St shaft location.	**Medium Constraints** ▪ Less space to implement potential relocations of near-surface utilities at shaft locations ▪ Significant storm sewer infrastructure at Queen St shaft location.

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
			▪ Hydro - 3 circuits of 3-phase power on the north side road. **More preferred as this Route has more space for potential relocation of utilities at shaft locations.**	▪ Hydro - 2 circuits lines of 3-phase power is on north side of the road **Less preferred due to less space to implement potential relocations of near-surface utilities at shaft locations**
Technical Environment	Conflicts with existing or planned infrastructure improvements	▪ Ability to avoid or mitigate conflicts with existing infrastructure ▪ Opportunity to co-ordinate Sanitary Trunk Sewer with other planned infrastructure improvements (e.g., Orangeville-Brampton Railway Multi Use Trail) including road resurfacing	**Medium Constraints** ▪ More space in ROW to implement infrastructure improvements, if required, as compared to Vodden. ▪ Conflict with recent Bovaird Drive (Hurontario Street to Kennedy Road) road/active transportation improvements ▪ Potential overlap between Williams Parkway transmission main and road improvements in addition to Queen Street infrastructure projects. **Significant conflict with recent Bovaird Drive/active transportation improvements.**	**Low Constraints** ▪ Vodden Street has temporary bike lanes that would be closed during construction at shaft locations and more difficult to mitigate. ▪ City of Brampton's East West Cycling Corridor project includes Vodden Street from Kennedy Road to Main Street. Current bicycle lanes are interim measures – potential opportunity to coordinate with implementation of ultimate road cross section. ▪ Potential overlap between Williams Parkway transmission main and road improvements in addition to Queen Street infrastructure projects. ▪ Provides opportunity to continue using future Williams Parkway 1200 mm watermain's shaft compound at Armbro Park, which is currently being negotiated with by the Region ▪ Opportunity to coordinate Orangeville-Brampton Railway multi-use trail improvements between Vodden Street and Bovaird Drive. **Minor conflicts identified with recent active transportation improvements. Also provides an opportunity to coordinate restoration with Orangeville-Brampton Railway multi-use trail**
Technical Environment	Construction truck traffic management issues during construction	▪ Ease of access to haul routes and ease of truck traffic management	**Low Constraints** ▪ Bovaird Drive is a major arterial road and accommodates significant truck traffic therefore the added truck traffic from construction would not be as impactful **Less impacts related to construction truck traffic**	**Medium Constraints** ▪ Vodden Street is a local collector road with less truck traffic and therefore added truck traffic from construction will be more impactful **More impacts related to construction truck traffic**
Technical Environment	Evaluation Ranking			**Route S2 is preferred from overall Technical Environment perspective.**
Climate Change	Climate change mitigation	▪ Potential for generating greenhouse gas emissions	**Low Constraints** ▪ Similar in length and as such have similar emissions related to construction duration **Similar impacts on climate change as this Route generates similar amount of greenhouse gas emissions during construction**	**Low Constraints** ▪ Similar in length and as such have similar emissions related to construction duration **Similar impacts on climate change as this Route generates similar amount of greenhouse gas emissions during construction**

Category	Criteria	Indicator/Consideration	Route S1: Kennedy/Bovaird	Route S2: Kennedy/Vodden/Orangeville-Brampton Railway
Climate Change	Climate change adaptation	▪ Vulnerability of project/ infrastructure to climate change effects	**Low Constraints** ▪ Similar amount of construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas and probability of flooding **Similar vulnerability to climate change effects related to flooding**	**Low Constraints** ▪ Similar amount of construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas and probability of flooding **Similar vulnerability to climate change effects related to flooding**
Climate Change	Evaluation Ranking		**Both Routes score similar from overall Climate Change perspective.**	**Both Routes score similar from overall Climate Change perspective.**
Economic / Financial	Estimated construction costs	▪ Relative construction costs compared to other routes	**High Constraints** ▪ Higher cost related to many deep shafts thus extending compound duration affecting high traffic road allowance **Route S1 is less preferred from a construction cost perspective due to deep tunnel shafts including extended construction duration within high traffic Right-Of-Way.**	**Medium Constraints** ▪ Lower costs related to shallower shafts on Vodden St which has lower traffic volumes ▪ Shorter construction duration thus less construction cost ▪ Minimizes impacts to traffic by maximizing Orangeville-Brampton Railway Right-Of-Way ▪ Orangeville-Brampton Railway has an existing sanitary sewer, however, construction impacts will be minimal due to depth of new Sanitary Trunk Sewer ▪ Orangeville-Brampton Railway has potential soil contamination related to former rail operations requiring more mitigation **Route S2 is more preferred from a construction cost perspective due to shallower tunnel shafts and shorter construction duration within lower traffic Right-Of-Way.**
Economic / Financial	Estimated operations and maintenance costs	▪ Potential access issues related to shaft locations and pipe depth ▪ Relative operations and maintenance costs compared to other routes	**Medium Constraints** ▪ Higher cost related to accessing shafts in high traffic Right of Way corridors (Kennedy Road and Bovaird Road) ▪ Deeper shafts and chambers would require longer maintenance time, specialized equipment and thus cost more **Route S1 is less preferred from operations and maintenance cost perspective.**	**Low Constraints** ▪ Easier access to shafts related to shallower depth and less traffic volumes in the Right of Way (Vodden Street and Orangeville-Brampton Railway alignment) ▪ Shallower shafts and chambers would require shorter maintenance time and thus cost less **Route S2 is more preferred from operations and maintenance cost perspective**
Economic / Financial	Evaluation Ranking			**Route S2 is preferred from overall Economic/Financial perspective.**
Overall	**Recommended Preferred Solution? (Yes/No)**		**NO**	**YES**

Table 2: Evaluation of Alternatives – North-listed Routes

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
Description of Alternative	-	-	Route N1 follows Orangeville-Brampton Railway Corridor, including Old School Road. Route has an approximate length of 9 km.	Route N2 follows McLaughlin Road, including Old School Road. Route has an approximate length of 9 km.
Natural Environment	Potential effects on water resources[3]	▪ Disruption to fish including spawning periods and physical changes to aquatic habitat (e.g., number and type of watercourse crossings, potential changes to water levels/base flow contribution, soil disturbance/ sedimentation) ▪ Groundwater management complexity (e.g., potential short-term water taking, including the need for Ministry of the Environment (MECP) Permits to Take Water)	**Low Constraints** ▪ A total of nine (9) fish-bearing watercourses were identified within 120 metres of Route N1. ▪ Less groundwater management complexity related to less construction within Toronto and Region Conservation Authority/Credit Valley Conservation regulated areas **Route N1 has ten (10) fewer fish-bearing watercourses, and less groundwater management complexity compared to Route N2.**	**Medium Constraints** ▪ A total of nineteen (19) fish-bearing watercourses were identified within 120 metres of Route N2. ▪ More groundwater management complexity related to more construction within Toronto and Region Conservation Authority/Credit Valley Conservation regulated areas and significant portion of route running parallel to Fletchers Creek (between Bovaird Drive and Mayfield Road) **Route N2 has ten (10) more fish-bearing watercourses, and more groundwater management complexity compared to Route N1 due to a portion of the Route running parallel to Fletchers Creek (Redside Dace [*Clinostomus elongatus*] Critical Habitat).**
	Potential effects on terrestrial features[3]	▪ Loss of vegetation (e.g., number and significance of trees removed and/or disturbed) ▪ Loss of or disruption to sensitive species habitat and natural heritage features (e.g., significant wetlands and woodlands, significant wildlife habitats [SWH], proximity to provincially or locally/regionally rare amphibians, birds or wildlife)	**Low Constraints** ▪ The following natural heritage features are located within 120m of the N1 Route and may be indirectly affected via trenchless methods: o Etobicoke Creek Headwater Provincially Significant Wetland (PSW) Complex: Two (2) crossings o Number of Woodlands[4]: Five (5) o City of Brampton Natural Heritage System (NHS): One (1) crossing o Town of Caledon Environmental Policy Area: Three (3) crossings o Greenbelt Protected Countryside: One (1) crossing o Candidate SWH: Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern	**Low Constraints** ▪ The following natural heritage features are located within 120m of the N2 Route and may be indirectly affected via trenchless methods: o Etobicoke Creek Headwater PSW Complex: Three (3) crossings o Number of Woodlands[4]: Three (3) o City of Brampton NHS: One (1) crossing o Town of Caledon Environmental Policy Area: Four (4) crossings o Greenbelt Protected Countryside: 1 crossing o Candidate SWH: Bat Maternity Colony, Waterfowl Nesting Area, Turtle Nesting Area, Seeps and Springs, Amphibian Breeding Habitat Woodland and Wetland, Marsh Breeding Bird Habitat and several habitats for Species of Conservation Concern ▪ Route is located predominately in urban developed areas or agricultural fields. No tree removal in woodlots or treed swamps are anticipated.

[3] Based on a desktop of background resources.
[4] Woodland areas are considered to be a generally continuous feature even if intersected by narrow gaps of 20 m or less in width.

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			▪ Route is located predominately in urban developed areas or agricultural fields. No tree removal in woodlots or treed swamps are anticipated. **Minimal loss of vegetation or disruption to sensitive habitats is anticipated along this Route as the majority of the Route will be installed via trenchless methods. Route N1 crosses the Provincially Significant Wetland at two locations, however, direct impacts are limited to exit and entrance shafts, which are outside of the Provincially Significant Wetland.**	**Minimal loss of vegetation or disruption to sensitive habitats is anticipated along this Route as the majority of the Route will be installed via trenchless methods. Route N2 crosses the Provincially Significant Wetland at three locations (one more crossing than Route N1), however, direct impacts are limited to exit and entrance shafts, which are outside of the Provincially Significant Wetland.**
	Potential effects on Species at Risk (SAR) and SAR habitat	▪ Loss of or disruption/disturbance to SAR or their habitats affecting the species ability to carry out its critical life processes in the local area.	**Medium Constraints** ▪ The following fourteen (14) SAR may occur within 120 m of the N1 Route and may be indirectly affected via trenchless methods: o Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-coloured Bat (*Perimyotis subflavus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*Lasiurus borealis*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*), Eastern Meadowlark (*Sturnella magna*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Butternut (*Juglans cinerea*), Black Ash (*Fraxinus nigra*) and Jefferson Salamander (*Ambystoma jeffersonianum*) o No aquatic SAR ▪ The following two (2) SAR may occur along the route that may be directly (i.e., loss of vegetation) or indirectly affected: o Bobolink and Eastern Meadowlark in hayfields or pastures if present ▪ Route is located predominately in urban developed areas or agricultural fields. No tree removal in woodlots or treed swamps are anticipated. **Similar impacts on SAR and SAR habitat**	**Medium Constraints** ▪ The following fifteen (15) SAR may occur within 120 m of the N2 Route and may be indirectly affected via trenchless methods: o Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Bobolink, Chimney Swift, Eastern Meadowlark, Red-headed Woodpecker, Butternut, Black Ash and Jefferson Salamander. o Redside Dace ▪ The following three (3) SAR may occur along the route that may be directly (i.e., loss of vegetation) or indirectly affected: o Redside Dace o Bobolink and Eastern Meadowlark in hayfields or pastures if present ▪ Route is located predominately in urban developed areas or agricultural fields. No tree removal in woodlots or treed swamps are anticipated. **Similar impacts on SAR and SAR habitat**
	Potential effects on soil and groundwater	▪ Potential to encounter soil and groundwater contamination and ability to mitigate	**Medium Constraints** ▪ Collected soil samples (WSP Phase 2 Environmental Site Assessment) within Orangeville-Brampton Railway do not meet applicable MECP Table 1 Site Conditions for several contaminants including Polycyclic Aromatic Hydrocarbons and Petroleum Hydrocarbons among others - Applies to Orangeville-	**Low Constraints** ▪ Route was not subject to Phase 2 Environmental Site Assessment – assume lower potential for soil contaminants and groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport is considered low, compared to Route N1.

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			Brampton Railway shaft compounds (requires additional evaluation through Due Diligence Risk Assessment). ▪ Shallow groundwater quality - risk potential for off-site adverse effects relative to any migration of several parameters via groundwater transport, is considered low - Applies to Orangeville-Brampton Railway shaft compounds (requires additional evaluation through Due Diligence Risk Assessment focused on shaft compounds). ▪ Soil contamination mitigation strategies will likely address any risks with contaminated soil and groundwater. **From a soil and groundwater contamination perspective, Route N1 is less preferred as it uses the Orangeville Bampton Railway corridor from Bovaird Drive to Old School Road which will require additional studies and measures to address soil and groundwater contamination compared to Route N1.**	▪ Soils Engineer was engaged to dp Contaminants Overview Study, they identified several Potential Contaminating Activities and Areas of Potential Environmental Concern (e.g. autobody and/or auto service garages, gasoline service stations) along the route. ▪ Soil contamination mitigation strategies will likely address any risks with contaminated soil and groundwater. **From a soil and groundwater contamination perspective, Route N2 is preferred as it avoids the Orangeville Bampton Railway corridor from Bovaird Drive to Old School Road.**
Natural Environment	Evaluation Ranking		**Both Routes score similar from overall Natural Environment perspective.**	**Both Routes score similar from overall Natural Environment perspective.**
Socio-Economic Environment	Number of potentially impacted sensitive receptors during construction and potential for increased noise, dust and vibration and reduced property access and potential business losses related to customers avoiding trips to high traffic commercial areas	▪ Schools ▪ Daycares ▪ Hospitals and emergency services ▪ Nursing homes ▪ Long-term care facilities ▪ Places of worship ▪ Recreational facilities and community centres ▪ High traffic commercial areas ▪ Libraries ▪ Cemeteries	**Low Constraints** Notable Sensitive Receptors: ▪ Chinguacousy Lions Club Water Tower Dog Park (2789 Mayfield Rd) ▪ Burnt Elm Park (45 Burnt Elm Drive) ▪ Burnt Elm Public School (85 Burnt Elm Drive) **Fewer sensitive receptors are impacted along Route N1 and therefore N1 is preferred.**	**Medium Constraints** Notable Sensitive Receptors: ▪ High traffic retail area north of Bovaird Drive ▪ Brampton Islamic Centre (6 Lowry Drive) ▪ Gurdwara Sikh Sangat Brampton (32 Regan Road) ▪ Nursing Home: Estherville Manor Retirement Residence (10606 McLaughlin Road North) ▪ Vital Urgent Care Brampton North (695 Remembrance Rd Unit 103) **More sensitive receptors are impacted along Route N2 and therefore N2 is less preferred.**
	Traffic and active transportation impacts during construction, including expected lane, sidewalk, trails, and bike lane closures	▪ Expected number/direction/duration of open lanes during construction and reduction in the number of intersecting roads affected by shaft locations ▪ Potential for increased public scrutiny related to inconvenience of higher traffic volumes/closures ▪ Opportunities to enhance active transportation	**Low Constraints** ▪ Orangeville-Brampton Railway alignment significantly avoids or minimizes lane closures ▪ No vehicle traffic in Orangeville-Brampton Railway alignment; may displace some pedestrian traffic using the Orangeville-Brampton Railway corridor. ▪ Route impacts vehicle traffic along Old School Road (shorter segment impacted compared with N2) ▪ Potentially impacting five (5) crossing roads where Route N1 intersects Regional or City/Town roadways: o Bovaird Drive is a 6-lane Major Arterial Roads (Regional) and Rapid Transit corridor	**Medium Constraints** ▪ McLaughlin Road alignment introduces traffic/transit and pedestrian/cyclist impacts throughout. McLaughlin Road is a 4-lane minor arterial road north of Bovaird Drive to south of Mayfield Road and a 2-lane minor arterial road from south of Mayfield Road to Old School Road. McLaughlin Road is a transit corridor ▪ Route impacts vehicle traffic along Olde School Road (longer segment impacted compared with N1) ▪ Route impacts vehicle traffic along Bovaird Drive (from to McLaughlin Road)

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			○ Mayfield Road is a 2-lane Major Arterial Roads (Regional) (not currently a transit corridor) ○ Sandalwood Parkway is a 4-lane divided Major Arterial Road (City) and transit corridor ○ Wanless Drive is a 4 lane Minor Arterial Road (City) and transit corridor ○ Old School Road is a 2-lane Collector Road ▪ Anticipate 1-lane closure on all intersecting roads: Bovaird Drive/RR107, Sandalwood Parkway, Wanless Drive, Mayfield Road, and Old School Road. ▪ Significant opportunity to enhance active transportation related to future Orangeville-Brampton Railway Multi Use Trail. **Route N1 is preferred as it avoids major traffic impacts on roads with high traffic volumes and provides significant opportunity for enhancing active transportation.**	▪ Potentially impact six (6) crossing roads where Route N2 intersects Regional or City/Town roadways: ○ Bovaird Drive is a 6-lane Major Arterial Roads (Regional) and Rapid Transit corridor ○ Mayfield Road is a 2-lane Major Arterial Roads (Regional) (not currently a transit corridor) ○ Wanless Drive is a 4 lane Minor Arterial Road (City) and transit corridor ○ Old School Road is a 2-lane Collector Road ○ Potters Wheel Gate is a local road ○ Lormel Gate/Lowry Drive is a local road ▪ Lane closures on McLaughlin Road potentially increase delay for seven (7) crossing roads: Marycroft Court, Sandalwood Parkway, Narcissus Gate, Bramtrail Gate, Whitepoppy Drive, Madawaska Road, and Tweechill Avenue ▪ Anticipate 2 lane closure on McLaughlin Road (in a 4-lane cross-section). ▪ Anticipate 1 lane closure on Old School Road (in a 2-lane cross section). ▪ Limited opportunities to enhance active transportation along McLaughlin Road or Old School Road due to lack of dedicated cycling or pedestrian infrastructure. **Route N2 is less preferred as there are major traffic impacts on heavily travelled roads and minimal opportunity for enhancing active transportation.**
	Potential impacts on public transit during construction, including bus stop closure/relocation	▪ Relocation of bus shelters and transit stops ▪ Temporary service interruptions ▪ Consideration of higher order transit routes	**Low Constraints** ▪ Avoids relocation of bus shelters and transit stops ▪ Avoids most higher order transit routes; crosses three (3) transit corridors on Bovaird Drive, Sandalwood Parkway and Wanless Drive and may introduce delays to transit services at crossing points with these roadways crossings. **Route N1 is more preferred as it avoids impacts to public transit shelters, stops and service.**	**Medium Constraints** ▪ Potential relocation of bus shelters and transit stops along McLaughlin Road, Bovaird Drive and Wanless Drive (Transit Corridors), along with delays to transit routes along these corridors ▪ Potentially introduces delays to transit corridor at route crossing of Sandalwood Parkway **Route N2 is less preferred as it results in impacts to public transit shelters, stops and service.**
Socio-Economic Environment	Potential impacts on agricultural operations	▪ Impacts on Canada Land Inventory Class 1-3 prime agricultural lands	**Medium Constraints** ▪ Lands north of Mayfield Road, within the Town of Caledon are prime agricultural land (defined as specialty crop areas and/or areas with Canada Land Inventory (CLI) Classes 1-3 lands) – potential loss of prime agricultural land related to temporary access from McLaughlin Road to Orangeville Brampton Railway corridor ▪ All affected lands are identified as “2051 New Urban Area” (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022)	**Low Constraints** ▪ No impacts on prime agricultural lands as all construction will be within the right-of-way.

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			More potential impacts due to potential loss of prime agricultural land related to temporary access from McLaughlin Road to Orangeville Brampton Railway corridor. Note that agricultural operations will eventually be displaced by future urban development as per Region's Official Plan.	**Route N2 is preferred as it avoids impacts to agricultural lands.**
Socio-Economic Environment	Evaluation Ranking		**Route N1 is preferred from an overall Socio-Economic Environment perspective.**	
Cultural Environment	Potential for loss and/or disturbance to potential archaeological resources	▪ Loss of or destruction of significant cultural heritage resources and archaeological sites and ability to mitigate	**Medium Constraints** ▪ Low to no archaeological potential along existing paved roads and former railway corridor due to previous disturbance. ▪ High archaeological potential for most areas outside of the paved roadway and railway corridor, particularly in the northern most section within and adjacent existing undisturbed agricultural lands. Stage 2 archaeological investigations required for all undisturbed lands, including tunnel shaft location areas. **Similar impacts from an archaeological perspective.**	**Medium Constraints** ▪ Low to no archaeological potential along existing paved roads due to previous disturbance. ▪ High archaeological potential for most areas outside of the paved roadway, particularly in the northern most section within and adjacent existing undisturbed agricultural lands. Stage 2 archaeological investigations required for all undisturbed lands, including tunnel shaft location areas. **Similar impacts from an archaeological perspective.**
	Potential effects on built heritage resources and cultural heritage landscapes.	▪ Loss of or disruption built heritage resources and cultural heritage landscapes (e.g. loss of a historic farmhouse or significant disruption of agricultural lands of a historic farmstead)	**Low Constraints** ▪ Four (4) known cultural heritage resources are located adjacent to Route N1. These properties have the potential to be indirectly adversely impacted by construction vibration. These four (4) properties include: o 12461 McLaughlin Road (Listed) o 12711 McLaughlin Road (Listed) o 12891 McLaughlin Road (Listed) o 2939 Old School Road (Listed) **Route N1 is preferred as there are less anticipated impacts on cultural heritage resources.**	**Medium Constraints** ▪ Nine (9) known cultural heritage resources are located adjacent to Route N1. These properties have the potential to be indirectly adversely impacted by construction vibration. These nine (9) properties include: o 12502 McLaughlin Road (Listed) o 12461 McLaughlin Road (Listed) o 12711 McLaughlin Road (Listed) o 12700 McLaughlin Road (Listed) o 12891 McLaughlin Road (Listed) o 12900 McLaughlin Road (Listed) o 12960 McLaughlin Road (Listed) o 13064 McLaughlin Road (Listed) o 2939 Old School Road (Listed) **Route N2 is less preferred as there are more impacts on cultural heritage resources.**
Cultural Environment	Evaluation Ranking		**Route N1 is preferred from an overall Cultural Environment perspective.**	
Legal/Jurisdictional	Compliance with applicable planning policies	▪ Potential conflicts with Peel Region, Town of Caledon, and City of Brampton Official Plan policies, including Secondary Plans, Master Servicing Plans, and Toronto and Region Conservation Authority (TRCA) and	**Low Constraints** ▪ All lands are identified as "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022) ▪ Compliant – no issues (supports planned growth)	**Medium Constraints** ▪ All lands are identified as "2051 New Urban Area" (Schedule E-1 of Peel Official Plan: Regional Structure, April 2022) ▪ Compliant – no issues (supports planned growth)

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
		Credit Valley Conservation (CVC) regulations	▪ Less construction within TRCA/CVC regulated areas **Route N1 is preferred due to less construction within Conservation Authority regulated areas.**	▪ More construction within TRCA/CVC regulated areas and significant portion of route running parallel to Fletchers Creek (between Bovaird Drive and Mayfield Road) **Route N2 is less preferred due to more construction within Conservation Authority regulated areas.**
	Land requirements	▪ Number of temporary and/or permanent easements	**Low Constraints** ▪ No permanent easement identified for sanitary trunk sewer at this time as it is assumed that the new sewer will be constructed with the existing road right-of-way or utility corridors. **Similar impacts from land requirement perspective**	**Low Constraints** ▪ No permanent easement identified for sanitary trunk sewer at this time as it is assumed that the new sewer will be constructed with the road right-of-way. **Similar impacts from land requirement perspective**
Legal/Jurisdictional	Evaluation Ranking		**Route N1 is preferred from an overall Legal/Jurisdictional perspective.**	
Technical Environment	Constructability	▪ Right-of-way width, ▪ length of pipe, ▪ Sewer/shaft depth ▪ Construction methodology, ▪ significant major infrastructure crossings ▪ shaft locations (e.g., in travelled section of ROW vs. outside of travelled section of ROW)	**Low Constraints** ▪ Rail Corridor and Old School ROW are 20m wide. ▪ The route length is approximately 8.6 km along the Orangeville Brampton Rail corridor from Bovaird Rd to Old School Road and then along Old School Road. ▪ Depth of the Sanitary Trunk Sewer in the range of between 10 to 30m. ▪ Trenchless construction methodology will be required. ▪ Connections to existing sewers and future sewers related to development will use open-cut construction method. ▪ Shaft and connection to existing and proposed sewers will be installed inside the Orangeville-Brampton Railway Right-Of-Way and travelled section of Old School Rd ▪ Additional open cut sewer to tie in future 525mm at McLaughlin ▪ Access from McLaughlin will be required in the northly section of the route. **Orangeville-Brampton Railway alignment avoids work in heavily travelled road allowances as well as utilities and watercourse encroachments.**	**High Constraints** ▪ McLaughlin ROW is 40m (south of Mayfield) and 20m (North of Mayfield) ▪ Old School ROW = 20m ▪ The route length is approximately 9.1 km from Bovaird Road/Orangeville-Brampton Railway intersection west along Bovaird Rd, then north on McLaughlin Road N and east on Old School Road to the north connection point at Old School Road and Hurontario Road. ▪ Trenchless construction methodology will be required ▪ Connections to existing sewers and future sewers related to development will use open-cut construction method. ▪ Significant land development work on both sides of the ROW may create some construction issues. **McLaughlin Road is heavily travelled south of Mayfield Road with significant utilities and watercourse encroachments into the ROW, thus limiting space for construction and greater impacts to the travelling public**
	Permits and approvals	▪ Complexity and duration to obtain the necessary permits and approvals (e.g., MTO/CNR/Metrolinx and TRCA/CVC permits for work in regulated areas) ▪ Road ownership/ occupancy permits	**Low Constraints** ▪ Some complexity with respect to permitting and approvals: o Less complicated and shorter duration of TRCA/CVC permitting related to work in regulated areas.	**Medium Constraints** ▪ More complicated with respect to permitting and approvals: o Longer duration of TRCA/CVC permitting (significant portion of route in CVC regulated areas related to Fletchers Creek running parallel

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			○ No CNR/Metrolinx permits needed ○ Requires MTO Encroachment Permit at Old School Road and Hurontario Street ▪ Requires Road Occupancy Permit from the Town of Caledon **Route N1 is more preferred from a permits and approvals perspective as both permitting/approvals and road occupancy requirements are less.**	to McLaughlin Road between Bovaird Drive and Mayfield Road) ○ No CNR/Metrolinx permits needed ○ Requires MTO Encroachment Permit at Old School Road and Hurontario Street ▪ Requires Road Occupancy Permits from the City of Brampton and Town of Caledon **Route N2 is less preferred from a permits and approvals perspective as both permitting/approvals and road occupancy requirements are more.**
	Connection points to existing and future Sanitary Trunk Sewers and sub-trunks	▪ Ease of construction and minimize pipeline length	**Medium Constraints** ▪ Longer length of connection pipe alignment to make connection from Fletcher's Creek (950m). **Route N1 less preferred due to longer length of connection from Fletcher's Creek STS**	**Low Constraints** ▪ Shorter length of connection pipe alignment to make connection from Fletcher's Creek (250m). **Route N2 more preferred due to shorter length of connection from Fletcher's Creek STS**
	Operations and maintenance	▪ Accessibility to maintenance chambers sites and sewer pipes	**Medium Constraints** ▪ Access for operations and maintenance will be from less travelled cross streets as part of future developments on east side of McLaughlin Road. However, getting to the cross streets may take longer. **Route N1 is less preferred due to accessibility for operations and maintenance purposes.**	**Low Constraints** ▪ Access for operations and maintenance will be within ROW of McLaughlin Road with wide boulevards, allowing access to shafts with minimal traffic management planning and setup. McLaughlin Road is also easier to access. **Route N2 is more preferred due to accessibility for operations and maintenance purposes.**
	Conflicts with existing utilities	▪ Significance of existing utilities and infrastructure and ability to maintain existing services or relocate existing utilities	**Low Constraints** ▪ Limited to no existing utilities in the Orangeville-Brampton Railway Right-of-Way. **Route N1 is more preferred as there are minimal utilities within the trunk sewer's routing alignment.**	**High Constraints** ▪ Local relocation of near-surface utilities at shaft locations. ▪ Significant existing infrastructure along the ROW. ▪ Hydro - 2 circuits of 3-phase power on the east side road. **Route N2 is less preferred as there are significant utilities within the trunk sewer's routing alignment.**
	Conflicts with existing or planned infrastructure improvements	▪ Ability to avoid or mitigate conflicts with existing infrastructure ▪ Opportunity to co-ordinate STS with other planned infrastructure improvements (e.g., Orangeville-Brampton Railway Multi-Use Trail including road resurfacing	**Low Constraints** ▪ Limited to no existing utilities in the Orangeville-Brampton Railway Right-Of-Way thus allowing for improvements, if required. ▪ Moratorium will be applied to Mayfield Rd following completion of road reconstruction that is currently underway. ▪ Provides opportunity to coordinate STS restoration with planned Orangeville-Brampton Railway Multi Use Trail. ▪ Potential to coordinate with future planned Old School Road's road improvements.	**Medium Constraints** ▪ Some space in ROW to implement infrastructure improvements, if required. ▪ Moratorium will be applied to Mayfield Rd following completion of road reconstruction that is currently underway. ▪ Does not provide opportunity to coordinate STS restoration with planned Orangeville-Brampton Railway Multi Use Trail. ▪ Potential to coordinate with future planned Old School Road's road improvements.

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			Route N1 is more preferred due to limited conflicts with existing and planned infrastructure including coordination with future Orangeville-Brampton Railway Multi-Use Trail.	**Route N2 is less preferred due to more conflicts with existing and planned infrastructure, and it does not provide opportunity to coordinate with future Orangeville-Brampton Railway Multi-Use Trail.**
	Truck traffic management issues during construction	▪ Ease of access to haul routes	**Medium Constraints** ▪ Bovaird Drive, Sandalwood Parkway, Wanless Drive and Mayfield Road are major arterial roads and accommodate significant truck traffic therefore the added truck traffic from construction would not be as impactful ▪ North of Mayfield Road, access will be through future development roads off of east side of McLaughlin Road **Slightly more impacts related to construction truck traffic**	**Low Constraints** ▪ McLaughlin Road is a major arterial road and accommodates significant truck traffic therefore the added truck traffic from construction would not be as impactful **Less impacts related to construction truck traffic**
Technical Environment	Evaluation Ranking		**N1 is preferred from an overall technical perspective.**	
Climate Change	Climate change mitigation	▪ Potential for generating greenhouse gas emissions	**Low Constraints** ▪ Similar in length and as such have similar emissions related to construction duration **Similar impacts on climate change as this route generates similar amount of greenhouse gas emissions during construction**	**Low Constraints** ▪ Similar in length and as such have similar emissions related to construction duration **Similar impacts on climate change as this route generates similar amount of greenhouse gas emissions during construction**
	Climate change adaptation	▪ Vulnerability of project/ infrastructure to climate change effects	**Low Constraints** ▪ Less construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas and probability of flooding **Similar vulnerability to climate change effects related to flooding**	**Medium Constraints** ▪ More construction within Toronto and Region Conservation Authority and Credit Valley Conservation regulated areas expected and higher probability of flooding particularly along McLaughlin Road (Fletcher's Creek runs parallel to S2 between Wanless Drive and Bovaird Drive) **More vulnerability to climate change effects related to flooding**
Climate Change	**Evaluation Ranking**		**N1 is preferred from overall Climate Change perspective.**	
Economic / Financial	Estimated construction costs	▪ Relative construction costs compared to other routes	**Low Constraints** ▪ Minimizes impacts to traffic by maximizing Orangeville-Brampton Railway Right of Way (lower traffic management costs) ▪ Lower site restoration costs ▪ Orangeville-Brampton Railway has minimal utilities ▪ Orangeville-Brampton Railway has potential soil contamination related to former rail operations, potentially requiring remediation at shaft compounds	**Medium Constraints** ▪ Higher cost related to many shaft compound in high traffic road allowance requiring more complicated traffic management and plan ▪ Higher site restoration costs ▪ Potential for utility conflicts resulting in utility relocations or protections

Category	Criteria	Indicator/Consideration	Route N1: Orangeville-Brampton Railway /Old School Road	Route N2: McLaughlin/Old School Road
			Route N1 is more preferred due to lower construction costs.	**Route N2 is less preferred due to higher construction costs.**
	Estimated operations and maintenance costs	▪ Potential access issues related to shaft locations and pipe depth ▪ Relative operations and maintenance costs compared to other routes	**Low Constraints** ▪ North portion of Orangeville-Brampton Railway route will require access from future local roads, resulting in lower costs as traffic management needs will not be less complicated ▪ Similar operations and maintenance costs **Route N1 is preferred due to lower operation and maintenance costs**	**Medium Constraints** ▪ Access for operations and maintenance will be within ROW of McLaughlin Road, resulting in higher costs for traffic management ▪ Similar operations and maintenance costs **Route N2 is less preferred due to higher operation and maintenance costs**
Economic / Financial	Evaluation Ranking		**Route N1 is preferred overall from an Economic /Financial perspective.**	
Overall	**Recommended Preferred Solution? (Yes/No)**		**YES**	**NO**