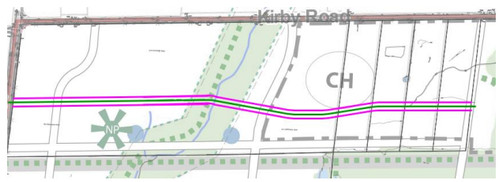
APPENDIX M

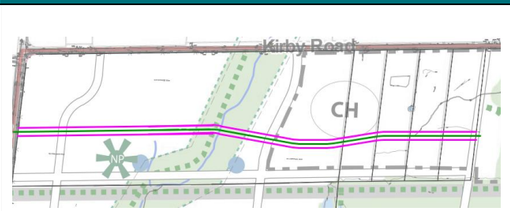
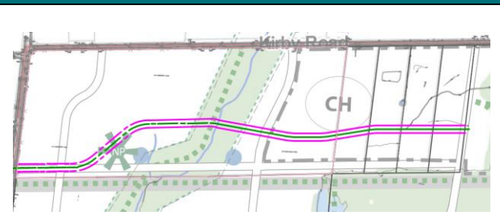
Detailed Alternative Alignment and Cross-section Evaluation Tables

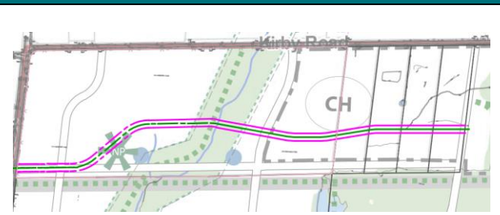
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 1)

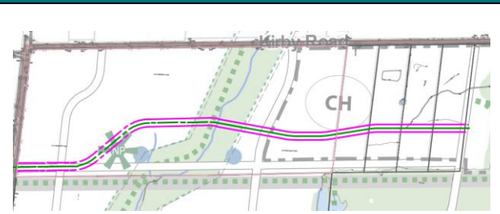
Legend:

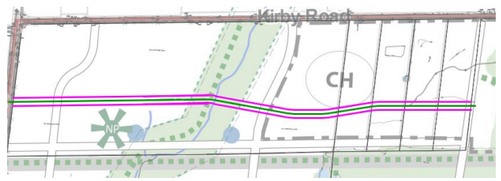
Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
Transportation								
Transit Serviceability	Supports an effective future transit route		• Roadway is part of a future transit route • Majority of the adjacent lands are developable which support land-uses that is more conducive to higher transit ridership (e.g., more points of interest)		• Roadway is part of a future transit route • A portion of the roadway is adjacent to the TCE pipeline and lands over pipeline is not developable. This reduces the land-uses / points of interest along the alternative which has the potential to impact ridership (i.e., lower)		• Roadway is part of a future transit route • Alternative runs parallel with the TCE pipeline and through the largest width of the Greenbelt where development cannot occur, and there will be a lack of land-uses south of the road (e.g., reduced points of interest) which has the potential to impact ridership (i.e., lower) due to a lack of points of interests south of the roadways. Where the road crosses the Greenbelt, there will be no developable land north or south of the road	
	Sub-Category Assessment							**Alternative 1A** is preferred from a transit serviceability perspective for the following reasons: • Roadway is part of a future transit route • Adjacent land-uses are conducive for higher transit ridership (e.g., more points of interests)
Supports Active Transportation	Encourages active transportation		• Alignment supports better surrounding land-uses which encourages active transportation users to utilize the road • Length of roads are similar (~50 m difference between the alternatives)		• Alignment supports surrounding land-uses which encourages active transportation users to utilize Street 1, however there is a portion of the road that runs adjacent to the TCE pipeline where lands south of road are undevelopable which decreases the number of interest points along Street 1 • Length of roads are similar (~50 m		• Alignment does not support surrounding land-uses which would encourages active transportation users to utilize the road (i.e., TCE pipeline and Greenbelt is undevelopable) • Length of roads are similar (~50 m difference between the alternatives))	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
					difference between the alternatives)			
	Considers pedestrian/cyclist safety	◑	• Curves slows vehicular speeds which enhances pedestrian / cyclist safety	◕	• Curves slows vehicular speeds which enhances pedestrian / cyclist safety	◑	• Straight road alignment typically results in higher vehicular speeds which decreases pedestrian / cyclist safety • Increases comfort for pedestrians and cyclists because straight line of sight is provided • There is potential for fewer driveways along Alternative 1C compared to Alternatives 1A & 1B thereby minimizing the number of conflict points for pedestrians and cyclists	
	Sub-Category Assessment		◕		◕		◑	**Alternatives 1A and 1B** are preferred equally from an active transportation perspective for the following reasons: • Both alignments support better surrounding land-uses which encourages active transportation users to utilize the road • The curves in both alignments would encourage lower vehicular speeds which enhances pedestrian / cyclist safety
Road Capacity	Provides sufficient road capacity for the projected traffic needs	◕	• Provides enough capacity for projected traffic needs	◕	• Provides enough capacity for projected traffic needs	◕	• Provides enough capacity for projected traffic needs	
	Sub-Category Assessment		◕		◕		◕	**Alternatives 1A-C** are preferred equally from a road capacity perspective because all alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards	◑	• Complies with City and Regional design standards • Intersection spacing to Kirby Road meets minimum requirements (>215 m) but not the recommended distance should a signal be warranted at this location in the	●	• Complies with City and Regional design standards • Intersection spacing to Kirby Road meets recommended distance (300 m) should a signal be warranted at this location in the future (to be determine in correspondence with York Region)	●	• Complies with City and Regional design standards • Intersection spacing to Kirby Road meets recommended distance (300 m) should a signal be warranted at this location in the future (to be determine in correspondence with	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
			future (to be determine in correspondence with York Region)				York Region)	
	Meets accessibility standards (AODA)	●	• Meets accessibility standards (AODA)	●	• Meets accessibility standards (AODA)	●	• Meets accessibility standards (AODA)	Maximum slope of the road is 3.5% or less. Since there are no significant differences between the 3 alternatives, there is no preferred option
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)	◔	• Provides some flexibility to accommodate future designs • Does not connect with Block 34E (per NVNCTMP road network) and would require coordination with Block 34E	●	• Provides some flexibility to accommodate future designs • Provides direct connection to Block 34E	●	• Provides some flexibility to accommodate future designs • Provides direct connection to Block 34E	
	GHG emissions	◑	• Difference in GHG emissions is negligible	◑	• Difference in GHG emissions is negligible	◑	• Difference in GHG emissions is negligible	
	Sub-Category Assessment		◑		◔		◔	**Alternatives 1B and 1C** are preferred equally from a design standard compliance perspective because both alternatives: • Meets recommended intersection spacing to Kirby Road (300 m) • Connects to Jane Street at NVNCTMP location to connect with road from Block 34E
Community Connectivity	Provides enhanced connections to major destinations for all modes	◔	• Provides opportunities for vehicles, transit, and active transportation movements across the entire end to end roadway • Road alignment away from the TCE pipeline and all lands north and south of the road are developable	◑	• Provides opportunities for vehicles, transit, and active transportation movements across the entire end to end roadway • The westerly section of the road is adjacent to the TCE pipeline which is undevelopable (reduces the points of interest / destinations along Alternative 1B)	◔	• Provides opportunities for vehicles, transit, and active transportation movements across the entire end to end roadway • High area of undevelopable land surrounding the road due to TCE pipeline and Greenbelt which reduces the points of interest / destinations along Alternative 1C	
	Contributes to flexibility of the network to allow for better access/services to community facilities (e.g., school, hub, park)	◔	• Alignment supports the development of lands adjacent to the road (e.g., is not adjacent to the TCE pipeline) thereby providing better services / points of interests to the community • Road connection to Street 5 is closer to community hub	◑	• Alignment supports surrounding land-uses which encourages active transportation users to utilize the road, however there is a portion of the road that runs adjacent to the TCE pipeline where lands south of road are undevelopable • Road connection to Street 5 is closer to community hub	◔	• Poor land-use surrounding work (single-sided road) due to restrictions for developing in Greenbelt & TCE Pipeline • Pipeline Street 5 connection further • Road connection to Street 5 is furthest from the community hub	
	Aligns with fine-grained network of streets (local,	◔	• Provides connections to most north-south streets in Block 27	◑	• Provides connections to most north-south streets in Block 27	◑	• Provides connections to most north-south streets in Block 27	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
	collector, and arterial)		• Provides another route for pedestrians between Kirby Road and TCE Pipeline (finer grid)					
	Sub-Category Assessment							**Alternative 1A** is preferred from a community connectivity perspective for the following reasons: • Higher area of developable lands adjacent to the road which supports higher transit ridership, encourages active transportation use, and enhances community connectivity • Supports a fine-grained road network
Overall Category Ranking								**Alternative 1A** is slightly preferred over Alternative 1B from an overall Transportation perspective for the following reasons: • Supports better land-uses surrounding Collector Street 1 (i.e., avoids undevelopable lands due to TCE Pipeline) thereby supporting a better / more utilized transit route, community connections, • Supports a fine-grained road network
Natural Environment								
Fish/Fish Habitat	Potential Impacts to fish or fish habitat		• No direct fish habitat negatively affected • Alternative 1A has the potential for negative effects on the drainage feature DF1 through modification of flow conveyance and sediment transport due to crossing of DF1 upstream portion		• No direct fish habitat negatively affected • Alternative 1B has the potential for negative effects on the drainage feature DF1 through modification of flow conveyance and sediment transport due to crossing of DF1 upstream portion		• No direct fish habitat negatively affected • Alternative 1C has the potential for negative effects on the drainage feature DF1 through modification of flow conveyance and sediment transport due to crossing of DF1 upstream portion	
	Level of opportunity to mitigate / minimize impact to fish and fish habitat		• Appropriate culvert design to maintain flow and sediment transport		• Appropriate culvert design to maintain flow and sediment transport		• Appropriate culvert design to maintain flow and sediment transport	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
	Sub-Category Assessment							• **Alternatives 1A, 1B and 1C** are preferred equally from a fish and fish habitat perspective because all alternatives do not negatively affect direct fish habitat. All have similar potential for negative effects on the drainage feature DF1 that can be mitigated through appropriate crossing design.
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation		• No anticipated measurable negative effects on natural vegetation		• No anticipated measurable negative effects on natural vegetation		• No anticipated measurable negative effects on natural vegetation	
	Impacts to wildlife and wildlife habitat		Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed planted trees in anthropogenic areas • Habitat for grassland birds associated with removed pastures / hayfields • See comments under Species at Risk		Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed planted trees in anthropogenic areas • Habitat for grassland birds associated with removed pastures / hayfields • See comments under Species at Risk		Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed planted trees in anthropogenic areas • Habitat for grassland birds associated with removed pastures / hayfields • See comments under Species at Risk	
	Potential Impacts to wildlife due to environmental fragmentation		• Potential disturbance resulting from Alternative 1A includes interference with north-south wildlife movement		• Potential disturbance resulting from Alternative 1B includes interference with north-south wildlife movement		• Potential disturbance resulting from Alternative 1C includes interference with north-south wildlife movement • See also evaluation for Species at Risk	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat		• Appropriate culvert design can accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF1		• Appropriate culvert design can accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF1		• Appropriate culvert design can accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF1	
	Sub-Category Assessment							• **Alternatives 1A, 1B and 1C** are preferred equally from a vegetation, wildlife, and wildlife habitat perspective
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to Greenbelt		• Impacts 0.55 ha of Greenbelt		• Impacts 0.55 ha of Greenbelt		• Impacts 1.02 ha of Greenbelt	
	Impacts to Provincially Significant Wetlands (PSW)		• No PSW unit negatively affected		• No PSW unit negatively affected		• No PSW unit negatively affected. • A portion of PSW 30 m buffer of approximately 0.03 ha would be part of the proposed infrastructure envelope	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
	Impacts to Significant Woodland	◑	• No Significant Woodland negatively affected	◑	• No Significant Woodland negatively affected	◔	• No Significant Woodland negatively affected • A portion of Significant Woodland 10 m buffer of approximately 0.19 ha would be part of the proposed infrastructure envelope	
	Impacts to Significant Wildlife Habitat (SWH)	◑	• No SWH impacted	◑	• No SWH impacted	◑	• No SWH impacted	
	Impacts to Greenbelt Plan Area	◔	• Approximately 0.5 ha of the Greenbelt Plan area will be used for road construction	◔	• Approximately 0.5 ha of the Greenbelt Plan area will be used for road construction	○	• Approximately 1 ha of the Greenbelt Plan area will be used for road construction	• Impacted Greenbelt Plan areas do not include natural features but due to their location have potential for restoration to natural areas
	Sub-Category Assessment	◑		◑		◔		**Alternatives 1A and 1B** are preferred from a designated natural heritage features and environmentally sensitive areas perspective for the following reasons: • No encroachment into woodland and PSW buffers • Smaller footprint within Greenbelt Plan area
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◑	• No rare species been recorded within footprint of Alternative 1A	◑	• No rare species been recorded within footprint of Alternative 1B	◑	• No rare species been recorded within footprint of Alternative 1C	
	Impacts to Species of Conservation Concern and their habitat	◑	• No impacts to Species of Concern resulting from Alternative 1A	◑	• No impacts to Species of Concern resulting from Alternative 1B	◑	• No impacts to Species of Concern resulting from Alternative 1C	
	Impacts to Endangered or Threatened Species and their habitat	◑	• Direct Impact on Bobolink and Eastern Meadowlark habitat of approximately 2.1 ha • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	◑	• Direct Impact on Bobolink and Eastern Meadowlark habitat of approximately 2.1 ha • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	◕	• Direct Impact on Bobolink and Eastern Meadowlark habitat of approximately 2.2 ha • Due to location along southern boundary of habitat patch, Alternative 1C has less effect on habitat fragmentation than other alternatives since the road sits along the southern boundary of the habitat • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	• Alternatives 1A and 1B bisect the habitat leaving two smaller remaining habitat areas north and south of the road. • Implications of impacts to Bobolink and Eastern Meadowlark habitats for all alternatives will be addressed through the MECP approval/permitting requirements

Evaluation Criteria		Alternative 1A	Alternative 1B	Alternative 1C	Comments / Rationale
					
	Sub-Category Assessment				**Alternative 1C** is preferred from a rare species, species of conservation concern, and endangered or threatened species perspective for the following reasons: • Lesser fragmentation effect on regulated SAR habitat
	Overall Category Ranking				**Alternatives 1A and 1B are** preferred equally from an overall Natural Environment perspective for the following reasons: • Avoids encroachment into woodland and PSW buffers • Smaller footprint within Greenbelt Plan area (0.5 ha less)
Hydrogeology and Drainage					
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources	• Alternative 1A is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	• Alternative 1B is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	• Alternative 1C is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources	• No significant impact to recharge anticipated from road construction	• No significant impact to recharge anticipated from road construction	• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources	• No anticipated impact to groundwater movement	• No anticipated impact to groundwater movement	• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area	• Alternative 1A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	• Alternative 1B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	• Alternative 1C is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water	• Area will be municipally serviced for drinking water	• Area will be municipally serviced for drinking water	• Area will be municipally serviced for drinking water	
	Sub-Category Assessment				**Alternatives 1A, 1B and 1C** are preferred equally from a hydrogeology / ground water perspective because no significant

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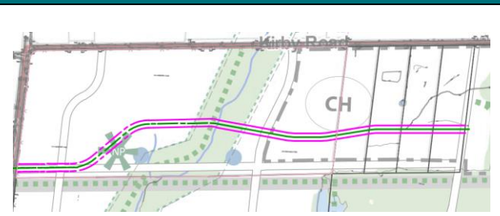
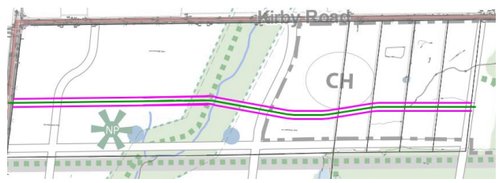
								
								impacts are anticipated for any of the alternatives and there is no preferred option
Surface Water and Drainage	Potential to affect surface water quality and quantity		• The shortest length of road and therefore the least impact on surface water quality and quantity of run-off		• The longest length of road and therefore the greatest impact on surface water quality and quantity of run-off		• The second shortest length of road and therefore moderate impacts on surface water quality and quantity of run-off	
	Provides sufficient drainage and treatment		• The run-off will be drained via storm sewers and catch basins to be treated in SWM facilities		• The run-off will be drained via storm sewers and catch basins to be treated in SWM facilities		• The run-off will be drained via storm and CBs to be treated in SWM facilities • This alternative will block drainage from a small portion of NHS, however, will be mitigated in design	
	Sub-Category Assessment							**Alternative 1A** is preferred from a surface water and drainage perspective for the following reasons: • The least impact on the quality and quantity of run-off
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))		• The length of flood plain crossing is approximately 73 m • No significant impacts anticipated with appropriate sizing of culverts		• The length of flood plain crossing is approximately 73m • No significant impacts anticipated with appropriate sizing of culverts		• The length of flood plain crossing is approximately 146 m • Larger crossing infrastructure may be required to minimize the impact	• Alternatives 1A and 1B are preferred equally.
	Sub-Category Assessment							• Alternatives 1A and 1B are preferred equally.
Overall Category Ranking								**Alternatives 1A and 1B** are preferred equally from an overall Hydrogeology / Drainage perspective for the following reasons: • Both alternatives have similar road lengths and therefore have similar impact on surface water quality and quantity of run-off • Requires a shorter floodplain crossing
Socio-Economic Environment								
Land-Use Policy Compliance	Conformity with Provincial, Regional, and municipal land-use policy objectives		• Provincial, Regional and Local planning policy, namely the PPS, Growth Plan, Greenbelt Plan, York		• Provincial, Regional and Local planning policy, namely the PPS, Growth Plan, Greenbelt Plan, York Region Official Plan		• Provincial, Regional and Local planning policy, namely the PPS, Growth Plan, Greenbelt Plan, York	

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
			Region Official Plan and Vaughan Official Plan require the efficient use of land in urban areas, while protecting for, among other elements, natural heritage features including the Greenbelt Plan Area. • Allows for the efficient development of urban land, which is consistent with and conforms to planning policy. • Crosses Greenbelt at a narrower point creating a smaller footprint within the Greenbelt Area • Does not conform with Block 27 Secondary Plan connection point to Jane Street (i.e., does not align with the collector road system to the west (Block 34E)) • Provides minimum spacing requirements to Kirby Road, which will create an inefficient development pattern.		and Vaughan Official Plan require the efficient use of land in urban areas, while protecting for, among other elements, natural heritage features including the Greenbelt Plan Area. • Allows for the efficient development of urban land, which is consistent with and conforms to planning policy. • Crosses Greenbelt at a narrower point creating a smaller footprint within the Greenbelt Area		Region Official Plan and Vaughan Official Plan require the efficient use of land in urban areas, while protecting for, among other elements, natural heritage features including the Greenbelt Plan Area. • Alignment is inefficient, since it provides a road along a pipeline, which reduces development potential and the ability to optimize urban land. • Does not reduce its footprint within the Greenbelt Plan area.	
	Sub-Category Assessment		◔		◕		◔	**Alternative 1B** is preferred from a policy compliance perspective for the following reasons: • It allows for an efficient development pattern • It optimizes land in the urban area • It reduces its footprint in the Greenbelt Area, which protects natural heritage features including the Greenbelt area. • Aligns with the collector road system to Block 34E per the NVNCTMP and Block 27 Secondary Plan to promote Block connectivity • Although Alternatives 1A and 1B are consistent with and conform to the applicable planning policy framework, Alternative 1B is more consistent and in conformity

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				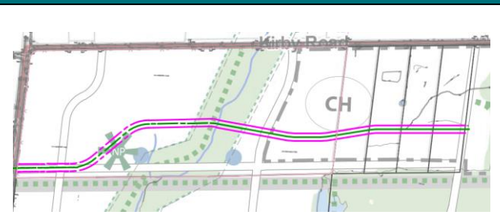				
Future Land Uses	Level of service to proposed land uses		• Provides a direct link from Arterial Roads to the Community Hub and close to the Transit Hub.		• Provides a direct link from Arterial Roads to the Community Hub and close to the Transit Hub.		• Lands south of road alignment are not developable due to TCE pipeline (i.e., poor land-use) and the significant woodlot	
	Sub-Category Assessment							**Alternative 1A** is preferred from a future land use perspective for the following reasons: • It allows for an efficient development pattern • It optimizes land in the urban area • It reduces its footprint in the Greenbelt Area, which protects natural heritage features including the Greenbelt area. • Although Alternative 1A and 1B are consistent with and conform to the applicable planning policy framework, Alternative 1B is more consistent and in conformity
Non-Participating Property Impacts	Number of impacted non-participating properties that would need to be acquired		One non-participating landowner		• One non-participating landowner		• One non-participating landowner • Impacts would be the least disruptive to the non-participating land-owner	
	Sub-Category Assessment							**Alternatives 1C** is preferred from a non-participating property impacts perspective because while all alternatives will impact one (1) participating land-owner, impacts associated with Alternative 1C is the least disruptive to the non-participating land-owner
Noise and Air Quality Impact	Impacts on noise and vibration sensitive receptors		• Road alignment is closest to the residential / farm property at 29 Kirby Rd. (non-participating)		• A portion of the road alignment swings closer to the residential / farm property at 29 Kirby Rd. (non-participating)		• Road alignment is furthest from the residential / farm property at 29 Kirby Rd. (non-participating)	
	Impacts on air quality		• The majority of the study area consists of agricultural land with no existing receptors; future conditions will include new residential uses (receptors)		• The majority of the study area consists of agricultural land with no existing receptors; future conditions will include new residential uses (receptors)		• The majority of the study area consists of agricultural land with no existing receptors; future conditions will include new residential uses (receptors)	

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		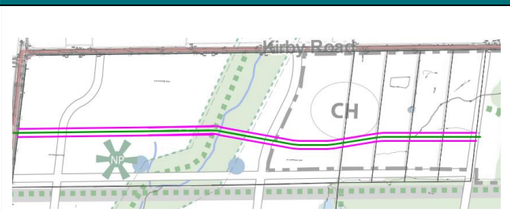		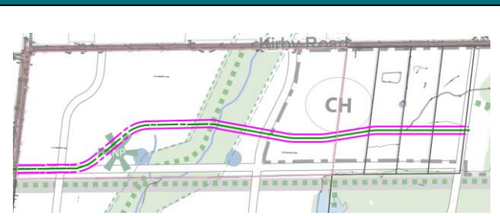				
	Sub-Category Assessment							**Alternative 1C** is preferred from a noise and air quality impact perspective for the following reasons: • Furthest away from the residential / farm property at 29 Kirby Rd. (non-participating)
Overall Category Ranking								**Alternative 1B** is preferred from an overall socio-economic environment perspective for the following reasons: • Allows for the efficient development of urban land, which is consistent with and conforms to planning policy. • Crosses Greenbelt at a narrower point creating a smaller footprint within the Greenbelt Area • Connects to Jane Street at the approved NVNCTMP location
Cultural Environment								
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost. • Disruption to the municipally listed cultural heritage landscape. (CHL), however, CHL will be removed as a result of the overall development		• No BHRs lost. • There will be physical change to the Listed CHL #1 context, however, CHL will be removed as a result of the overall development.		• No (BHRs) lost. • There will be physical change to the Listed CHL #1 context, however, CHL will be removed as a result of the overall development.	
	Opportunities to frame and celebrate heritage resources		• Can support a commemorative heritage interpretation program.		• Can support a commemorative heritage interpretation program.		• Can support a commemorative heritage interpretation program.	
	Sub-Category Assessment							**Alternatives 1A, 1B, and 1C** are preferred equally from a built cultural resources and cultural heritage landscapes perspective because all alternatives avoid impacts to BHR, but will result in a disruption to a CHL, however the CHL will be removed as a result of the overall development
Archaeological Resources	Impacts to previously undisturbed lands with		• Parcel 10 requires assessment • Stage 2 fieldwork and associated		• Parcel 10 requires assessment • Stage 2 fieldwork and associated		• Parcel 10 requires assessment • The entire parcel will need to be	

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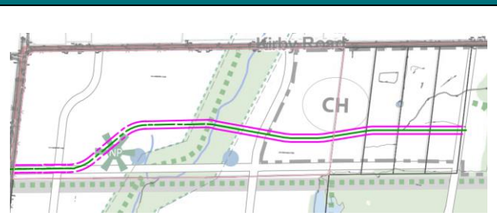
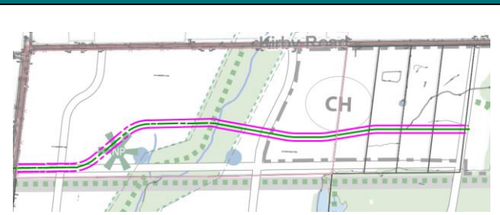
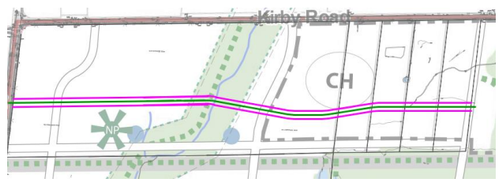
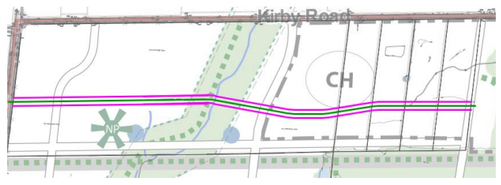
								
	archaeological potential		engagement will be required.		engagement will be required.		subject to Stage 2; however, this alignment has the road going through Site AlGv-130 which could be avoided for assessment at a later date. • The Site will eventually need to be mitigated for development to occur.	
	Sub-Category Assessment							**Alternatives 1A & 1B** are preferred from an archeological resource perspective for the following reasons: • Avoidance of Site AlGv-130, however, a Stage 2 archaeological assessment will be required on Parcel 10
Overall Category Ranking								**Alternatives 1A and 1B** are preferred equally from an overall Cultural Environment perspective for the following reasons: • Avoids impacts to archaeological Site AlGv-130
Cost & Constructability								
Engineering Feasibility and Construction Cost	Ease of Construction		• The shortest road and shortest crossing		• Length of road is slightly longer than Alternative 1A		• NHS crossing and being close PSW and woodlot should be taken into consideration	• Although Alternative 1A is a slightly shorter road, the difference between Alternative 1A and 1B are negligible and Alternatives 1A and 1B are preferred equally
	Cost effectiveness to build		• The shortest road and shortest crossing		• The road is approximate 58 m longer than the shortest alternative but crossing is the same as shortest option (Alternative 1A)		• The second shortest route but costly due to longer NHS crossing	
	Cost of compensation for impacts to the natural environment		• There is a floodplain crossing • There is no other environmental feature to compensate		• There is only a floodplain crossing • There is no other environmental feature to compensate		• Minor encroachment into woodlot and PSW VPZ buffer	
	Sub-Category Assessment							**Alternatives 1A and 1B** are preferred equally from an engineering feasibility and construction cost perspective for the following reasons: • Both alternatives have similar road lengths and shortest

Evaluation Criteria		Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
								
								crossing • Avoids minor encroachment into woodlot and PSW VPZ buffer
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)	◑	• Utility pole to be relocated	◑	• Utility pole to be relocated	◑	• Utility pole to be relocated	
	Impacts on existing municipal infrastructure	◑	• Utility pole to be relocated	◑	• Utility pole to be relocated	◑	• Utility pole to be relocated	
	Sub-Category Assessment		◑		◑		◑	**Alternatives 1A, 1B, 1C** are preferred equally from an existing municipal infrastructure and utilities perspective because all alternatives will require the relocation of a utility pole
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)	◕	• Lower capital cost due to smallest amount of pavement (similar to Alternative 1B) • Similar length of crossing required	◕	• Slightly longer road than Alternative 1A, however, 58m additional length of road will not significantly increase the capital cost • Lowest capital cost is due to smallest amount of crossing.	◔	• Highest capital cost due to longest crossing requirement	
	Sub-Category Assessment		◕		◕		◔	**Alternatives 1A and 1B** are preferred equally from a capital cost perspective for the following reasons: • Both alternatives have similar road lengths and shortest crossing, which would result in the lowest capital cost
Property Cost	Scale of non-participating property costs (relative scale-preferred to least preferred)	◑	• 1013 m road within non-participating landowner	◔	• 1071 m road within non-participating landowner	◑	• 1013 m within non-participating landowner	
	Sub-Category Assessment	◑	• The smallest land requirement	◔	• More land is required	◑	• The smallest land requirement	**Alternatives 1A and 1C** are preferred from a property acquisition perspective for the following reasons: • Requires the least land from non-participating landowner
Operating and Maintenance Costs	Operating and maintenance costs	◕	• Lowest cost operation since it is the shortest route (pavement & crossing)	◕	• Slightly longer road than Alternative 1A, however, 58 m additional length of road will not significantly increase the operating	◑	• The second smallest cost operation since it is the second shortest route	

Evaluation Criteria	Alternative 1A	Alternative 1B	Alternative 1C	Comments / Rationale
				
Sub-Category Assessment	cost			**Alternative 1A** is preferred from an operating and maintenance costs perspective for the following reasons: • Lowest operational and maintenance costs
Overall Category Ranking				**Alternative 1A** is preferred from an overall Cost & Constructability perspective for the following reasons: • Shortest length of road (i.e., less pavement) and crossing which would result in lowest construction, operation, and maintenance costs • Requires the least land from non-participating landowner
OVERALL EVALUATION				**Alternative 1A was selected as the preferred Street 1 alternative for the following reasons:** • Supports better land-uses surrounding Collector Street 1 (i.e., avoids undevelopable lands due to TCE Pipeline) thereby supporting a better / more utilized transit route, community connections, • Supports a fine-grained road network • Avoids encroachment into woodland and PSW buffers • Smaller footprint within Greenbelt Plan area (0.5 ha less) • Least impact on surface water quality and quantity of run-off, and • Shortest length of road and crossing which would result in lowest construction, operation, and maintenance

Evaluation Criteria	Alternative 1A		Alternative 1B		Alternative 1C		Comments / Rationale
							
							costs • Requires the least land from non-participating landowner

Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives: Street 2

Legend:

Evaluation Criteria		Alternative 2A		Alternative 2B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route	●	• Protected for four lanes which would accommodate transit	●	• Protected for four lanes which would accommodate transit	
	Sub-Category Assessment		●		●	**Alternatives 2A and 2B** are preferred equally from a transit serviceability perspective because both alternatives are protected for four lanes which would accommodate transit
Supports Active Transportation	Encourages active transportation	◕	• Provides safe space for active transportation users along hilly topographic terrain	◕	• Provides safe space for active transportation users along hilly topographic terrain	
	Considers pedestrian/cyclist safety	●	• Provides pedestrian and cyclists safety infrastructure	●	• Provides pedestrian and cyclists safety infrastructure	
	Sub-Category Assessment		◕		◕	**Alternatives 2A and 2B** are preferred equally from an active transportation perspective because both alternatives provide safe space for active transportation users
Road Capacity	Provides sufficient road capacity for the projected traffic needs	●	• Provides enough capacity for projected traffic needs	●	• Provides enough capacity for projected traffic needs	
	Sub-Category Assessment		●		●	**Alternatives 2A and 2B** are preferred equally from a road capacity perspective because both alternatives will provide the same road capacity and will meet protected traffic needs for Block 27
Design Standard Compliance	Compliance with City and Regional design standards	●	• Complies with City and Regional design standards	●	• Complies with City and Regional design standards	
	Meets accessibility standards (AODA)	●	• Meets accessibility standards	●	• Meets accessibility standards	Majority of road has less than 3.5% slope except the portion of road between railway and Keele Street which has steeper slope.

	Flexibility to accommodate future designs (i.e., implementation adjacent studies)		• Connection location to Jane Street is at the recommended in the TMP and will connect with adjacent Block 34E • Connection location to Keele Street is generally at the recommended TMP connection, and meets the spacing distance requirements to signalize the North Maple Regional Parkentrance intersection		• Connection location to Jane Street is at the recommended in the TMP and will connect with adjacent Block 34E • Connection location to Keele Street is generally at the recommended TMP connection, and meets the spacing distance requirements to signalize the North Maple Regional Park entrance intersection	
	GHG emissions		• Difference in GHG emissions is negligible		• Difference in GHG emissions is negligible	
	Sub-Category Assessment					**Alternative 2A and 2B** are preferred equally from a design standard compliance perspective because both alternatives meet all design standards and have the ability to accommodate future designs and emerging technologies
Community Connectivity	Provides enhanced connections to major destinations for all modes		• Provides opportunities for vehicles, transit and active transportation movements across the entire end to end roadway		• Provides opportunities for vehicles, transit and active transportation movements across the entire end to end roadway	
	Contributes to flexibility of the network to allow for better access/service		• Provides an alternative route heading east to west along the entire Block 27 area • Connects to Jane Street at the recommended location in the Block 27 Secondary Plan to enhance block connectivity with Block 34E		• Provides an alternative route heading east to west along the entire Block 27 area • Connects to Jane Street at the recommended location in the Block 27 Secondary Plan to enhance block connectivity with Block 34E	
	Aligns with fine-grained network of streets (local, collector, and arterial)		• Street 2 provides end-to-end access across the entire Block 27; connecting with all north-south minor and major streets and local roadways		• Street 2 provides end-to-end access across the entire Block 27; connecting with all north-south minor and major streets and local roadways	
	Sub-Category Assessment					**Alternative 2A and 2B** are preferred equally from a community connectivity perspective because both alternatives provide end-to-end connectivity across Block 27
Overall Category Ranking						**Alternative 2A and 2B are** preferred equally from an overall transportation perspective for the following reasons: • Both alternatives meet capacity requirements and design standards • Provides the same level of community connectivity • Equally supports active transportation, and transit serviceability
Natural Environment						
Fish/Fish Habitat	Potential Impacts to fish or fish habitat		• No direct fish habitat negatively affected. • Potential negative effects on the drainage features DF1 and DF3 through modification of flow conveyance and sediment transport due to crossing of DF1 and DF3 upstream portions		• No direct fish habitat negatively affected. • Potential negative effects on the drainage features DF1 and DF3 through modification of flow conveyance and sediment transport due to crossing of DF1 and DF3 upstream portions	

	Level of opportunity to mitigate / minimize impact to fish and fish habitat	●	• Appropriate culvert design can maintain flow and sediment transport	●	• Appropriate culvert design can maintain flow and sediment transport	
	Sub-Category Assessment		◑		◑	**Alternative 2A and 2B are** preferred equally from a fish and fish habitat perspective
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation	◔	• Wetland vegetation negatively affected as part of PSW removal • Removal of portions of treed hedgerows	◑	• Minimizes impacts to wetland vegetation • Removal of portions of treed hedgerows	
	Impacts to wildlife and wildlife habitat	◔	• Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows • Impacts habitat for amphibians (Spring Peeper, Wood Frog, American Toad), small mammals and common wetland bird species provided by 0.12 ha of meadow marsh	◑	• Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows • Minimizes impacts to amphibian habitat, small mammals, and common wetland bird species	
	Potential impacts to wildlife due to environmental fragmentation	◔	• Potential disturbance resulting from Alternative 2A includes interference with north-south wildlife movement along the road alignment, notably at crossings with drainage features DF1 and DF3. • Habitat fragmentation through construction of a road between wetland units of the PSW with potential for increased wildlife road mortality (including amphibians and small mammals).	◔	• Potential disturbance resulting from Alternative 2B includes interference with north-south wildlife movement along the road alignment, notably at crossings with drainage features DF1 and DF3. • Habitat fragmentation through construction of a road between wetland units of the PSW with potential for increased wildlife road mortality (including amphibians and small mammals).	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife along Drainage Features DF1 and DF3 (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals)	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife along Drainage Features DF1 and DF3 (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals)	
	Sub-Category Assessment		◔		◑	**Alternative 2B** is preferred from a vegetation, wildlife, and wildlife habitat perspective for the following reasons: • Minimizes impacts on wetland wildlife functions
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to Greenbelt	◑	• Impacts 0.86 ha of Greenbelt	◑	• Impacts 0.87 ha of Greenbelt	
	Impacts to Provincially Significant Wetlands	○	• Alternative 2A involves the removal of approximately 0.12 ha of wetland from the PSW and 0.31 ha of associated 30 m buffer	◔	• Alternative 2B involves the removal of approximately 0.02 ha of wetland from the PSW and 0.40 ha of associated 30 m buffer	
	Impacts to Significant Woodland	◑	• No Significant Woodland negatively affected. • A portion of Significant Woodland 10 m buffer of approximately 0.06 ha would be part of the proposed infrastructure envelope for both alternatives	◑	• No Significant Woodland negatively affected. • A portion of Significant Woodland 10 m buffer of approximately 0.06 ha would be part of the proposed infrastructure envelope for both alternatives	
	Impacts to significant wildlife habitat (SWH)	◑	• No SWH is negatively affected	◑	• No SWH is negatively affected	
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland	
	Sub-Category Assessment		◔		◑	**Alternative 2B** is preferred from an environmental sensitive area perspective for the following reasons: • Minimizes encroachment into the PSW

Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat		• No rare species have been recorded within footprint of Alternative 2A		• No rare species have been recorded within footprint of Alternative 2B	
	Impacts to Species of Conservation Concern and their habitat		• No impacts to Species of Conservation Concern resulting from Alternative 2A		• No impacts to Species of Conservation Concern resulting from Alternative 2B	
	Impacts to Species at Risk (Endangered or Threatened) and their habitat		• No endangered and threatened species been recorded within footprint of Alternative 2A		• No endangered and threatened species been recorded within footprint of Alternative 2B	Additional targeted search for Butternut trees (*Juglans cinerea*) will be required at later stages in portions of treed hedgerow proposed for removal
	Sub-Category Assessment					**Alternative 2A and 2B are** preferred equally from a rare species, species of conservation concern, and endangered or threatened species perspective.
	Overall Category Ranking					**Alternative 2B** is preferred from an overall natural environment perspective for the following reasons: • Minimizes impacts on wetland wildlife functions • Minimizes encroachment into the PSW
HYDROGEOLOGY & DRAINAGE						
Hydrogeology / Groundwater	Potential to affect the quality of groundwater resources		• A portion of Alternative 2A is located in an area mapped as having highly vulnerable aquifers; however, no significant impact to groundwater quality anticipated with BMPs in place for road salt management		• A portion of Alternative 2B is located in an area mapped as having highly vulnerable aquifers; however, no significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area		• Alternative 2A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 2B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water	
	Sub-Category Assessment					**Alternative 2A and 2B are** preferred equally from a hydrogeology / ground water perspective as there are no significant impacts anticipated
Surface Water and Drainage	Potential to affect surface water quality and quantity		• The length of the road is ~2034 m		• The length of the road is ~2039 m	• The impacts between the two alternatives are the same
	Provides sufficient drainage and treatment		• Quantity and quality control of runoff is being provided by SWM ponds		• Quantity and quality control of runoff is being provided by SWM ponds	
	Sub-Category Assessment					**Alternative 2A and 2B are** preferred equality from a surface water and drainage perspective because the impacts between the two alternatives are the same

Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))		• The feature DF3 crossings are similar to Alternative 2B • The crossing of the DF1 is longer than that of Alternative 2B • Crosses DF1 where there is a wetland (i.e., direct impacts to the wetland and portion of its buffer)		• The DF3 crossings are similar to Alternative 2A • The crossing DF1 is shorter than that of Alternative 2A • Crossing of DF1 avoids direct impacts to the wetland, but impacts the wetland buffer	
	Sub-Category Assessment					**Alternative 2B** is preferred from a floodplain perspective for the following reasons: • Shorter crossing • Avoids crossing and directly impacting the PSW
Overall Category Ranking						**Alternative 2B** is preferred from an overall Hydrogeology and Drainage perspective for the following reasons: • Crossing of the DF1 is shorter than Alternative 2A • Avoids crossing the PSW (impacts wetland buffer)
Socio-Economic Environment						
Land-Use Policy Compliance	Conformity with Provincial, Regional, and municipal land-use policy objectives		• Conforms with Provincial, Regional, and municipal land-use policy objectives, namely the PPS, Growth Plan, Greenbelt Plan, York Region Official Plan and Vaughan Official Plan require the efficient use of land in urban areas, while protecting for, among other elements, natural heritage features including the Greenbelt Plan Area • Alternative 2A allows for the efficient development of urban land, which is consistent with and conforms to planning policy • Alternative 2A also provides an efficient and narrow footprint in the Greenbelt Area		• Conforms with Provincial, Regional, and municipal land-use policy objectives, namely the PPS, Growth Plan, Greenbelt Plan, York Region Official Plan and Vaughan Official Plan require the efficient use of land in urban areas, while protecting for, among other elements, natural heritage features including the Greenbelt Plan Area • Alternative 2B allows for the efficient development of urban land, which is consistent with and conforms to planning policy • Alternative 2B also provides an efficient and narrow footprint in the Greenbelt Area (slightly smaller area by ~300m^2 of Greenbelt) • Alternative 2B avoids a natural heritage feature	
	Sub-Category Assessment					**Alternative 2B** is preferred from a policy compliance perspective for the following reasons • It reduces its footprint in the Greenbelt Area, which protects natural heritage features including the Greenbelt area • Although Alternative 1A and 1B are consistent with and conform to the applicable planning policy framework, Alternative 1B is more consistent and in conformity
Future Land Uses	Level of service to proposed land uses		• Alternative 2A provides end-to-end east-west access across the whole development site • Provides access to all proposed land uses		• Alternative 2B provides end-to-end east-west access across the whole development site • Provides access to all proposed land uses	
	Sub-Category Assessment					**Alternative 2A and 2B** are preferred equally from a future land use perspective
Impacts to Non-Participating Properties	Number of impacted properties that would need to be acquired		• Requires the same number of impacts to non-participating property owners as Alternative 2B		• Requires the same number of impacts to non-participating property owners as Alternative 2A	

	Sub-Category Assessment					
Noise and Air Quality Impact	Impacts on noise and vibration sensitive receptors		• There are no non-participating properties areas / noise sensitive areas within the vicinity of Alternative 2A		• There are no non-participating properties areas / noise sensitive areas within the vicinity of Alternative 2B	
	Impacts on air quality		• The majority of the study area consists of agricultural land with no existing receptors within the vicinity of Alternative 2A		• The majority of the study area consists of agricultural land with no existing receptors within the vicinity of Alternative 2B	
	Sub-Category Assessment					**Alternatives 2A and 2B** are preferred equally from a noise and air quality Impact perspective because there are no non-participating properties areas / noise/air quality sensitive receptors within the vicinity of either alternative and there are no discernible differences between the two options
	Overall Category Ranking					**Alternative 2B** is preferred equally from an overall Socio-Economic Environment perspective for the following reasons: • Reduces impacts to the Greenbelt, thereby conforming with the Greenbelt Plan • Although Alternatives 2A and 2B are consistent with and conform to the applicable planning policy framework, Alternative 2B is more consistent and in conformity
Cultural Environment						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost. • Linear profile appears to be less disruptive to the original heritage context • There will be physical change to the Listed CHL #1 and CHL# 7 context through roadway location disruption. This will increase the level of potential impacts to identified Listed cultural heritage resources, however, CHLs will be removed as a result of the overall development.		• No built heritage resources (BHR) lost. • There will be physical change to the Listed CHL #1 and CHL# 7 context through roadway disruption. This will increase the level of potential impacts to identified Listed cultural heritage resource, however, CHL will be removed as a result of the overall development	• 2A linear connection at Jane St. is more reminiscent of the original field pattern. • Both roadways at Keele Street avoid the built resources. • If the residence remains in situ, an appropriate buffer should be considered
	Sub-Category Assessment					**Alternative 2A** is preferred from a built cultural resources and cultural heritage landscapes perspective, for the following reasons: • On the west side of the roadway at Jane Street the linear profile appears to be less disruptive to the original heritage context • Opportunities to support a commemorative heritage program
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential		• Stage 2 Assessment of the greenspace in the west • Stage 3 cemetery investigation surrounding Hope Primitive Methodist Church & Cemetery, and • Stage 2 Construction monitoring within the areas identified by the City of Vaughan Ossuary Model • Indigenous Nation engagement will be required for fieldwork		• Stage 2 Assessment of the greenspace in the west • Stage 3 cemetery investigation surrounding Hope Primitive Methodist Church & Cemetery • Stage 2 Construction monitoring within the areas identified by the City of Vaughan Ossuary Model • Indigenous Nation engagement will be required for fieldwork	• The scope of work from an archaeological perspective is unchanged for both alignments

	Sub-Category Assessment					**Alternative 2A and 2B** are preferred equally from an archaeological resources perspective because the scope of work from an archaeological perspective is unchanged for both alternatives
Overall Category Ranking						**Alternative 2A and 2B** are preferred equally from an overall Cultural Environment perspective for the following reasons: • No built heritage resources will be lost • Scope of archaeological work are the same for both alternatives
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction		• Requires a longer crossing of a portion of west tributary where there is an existing wetland		• Easier to construct, the crossing lengths are the shortest	
	Cost effectiveness to build		• Longer crossing will be costlier		• Shorter crossings will be cheaper	
	Cost of compensation for impacts to the natural environment		• The wetland will be impacted requiring compensation (i.e., cost for compensation)		• No wetland compensation is required for the impacted wetlands	Buffer encroachment does not require wetland replication per se but would be part of the overall discussion on land base compensation
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development		• Construction can be phased		• Construction can be phased	• There are no significant differences between the two alternatives
	Sub-Category Assessment					**Alternative 2B** is preferred from an engineering feasibility and construction cost perspective for the following reasons: • Shorter crossing length • Minimizes affects to the exiting wetland
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)		• Railway crossing is required • Utilities on regional road should be relocated if it is required		• Railway crossing is required • Utilities on regional road should be relocated if it is required	• No significant difference
	Impacts on existing municipal infrastructure		• Impacts on existing municipal infrastructure would be the same as Alternative 2B • No significant difference		• Impacts on existing municipal infrastructure would be the same as Alternative 2A • No significant difference	• No significant difference
	Sub-Category Assessment					• No significant difference
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)		• Longer water course crossing is required, resulting in higher capital costs		• Shorter water course crossing is required, resulting in lower capital costs	
	Sub-Category Assessment					**Alternative 2B** is preferred from a capital cost perspective for the following reasons: • Shorter watercourse crossing
Property Costs	Scale of non-participating property costs (relative scale-preferred to least preferred)		• Same as Alternative 2B		• Same As Alternative 2A	• No Difference
	Sub-Category Assessment					• No Difference

Operating and Maintenance Costs	Operating costs		• Same as Alternative 2B. because it is almost the same length		• Same as Alternative 2A. because it is almost the same length	
	Scale of maintenance costs		• Crossing lengths are longer so maintenance Cost is greater		• Crossing lengths are shorter so maintenance Cost is less	• Alternative 2B is preferred
	Level of maintenance and operation required		• Similar maintenance and operation costs • Longer watercourse crossing would result in slightly higher maintenance / operation costs		• Similar maintenance and operation costs • Shorter watercourse crossing would result in slightly lower maintenance / operation costs	• No Significant difference
	Sub-Category Assessment					**Alternative 2B** is preferred from an operating and maintenance costs perspective for the following reasons: • Shorter crossing length, therefore, lowest operating and maintenance costs
Overall Category Ranking						**Alternative 2B** is preferred from an overall Cost & Constructability perspective for the following reasons: • Shortest road and crossing lengths therefore, lowest construction, operating and maintenance costs
OVERALL EVALUATION						**Alternative 2B was selected as the preferred Street 2 Alternative 2 for the following reasons:** • Minimizes impacts on wetland wildlife functions • Minimizes encroachment into the PSW • Reduces impacts to the Greenbelt, thereby conforming with the Greenbelt Plan • Crossing of the DF1 is shorter than Alternative 2A • Although Alternatives 2A and 2B are consistent with and conform to the applicable planning policy framework, Alternative 2B is more consistent and in conformity • Requires a shorter crossing (i.e., increases ease of construction, and reduces capital and operating/maintenance costs)

Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 3)

Legend:

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route		• Accommodates future transit infrastructure		• Accommodates future transit infrastructure	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a transit serviceability perspective because both alternatives have the ability to accommodate future transit infrastructure
Supports Active Transportation	Encourages active transportation		• Active transportation can be suitably accommodated • Traverses through greater environmentally sensitive lands which decreases the developable land / land-uses adjacent to the road (decreases points of interest for AT users) • Longer route		• Active transportation can be suitably accommodated • Traverses through less environmentally sensitive lands which increases the developable land / land-uses adjacent to the road (increases points of interest for AT users) • Shorter route may encourage more AT users	
	Considers pedestrian/cyclist safety		• Provides safe facilities for both pedestrians and cyclists		• Provides safe facilities for both pedestrian and cyclists	
	Sub-Category Assessment					**Alternative 3B** is preferred from an active transportation perspective for the following reasons: • Traverses through less environmentally sensitive lands which increases the developable land / land-uses adjacent to the road (increases points of interest) • Shortest road length
Road Capacity	Provides sufficient road capacity for the projected traffic needs		• Provides enough capacity for projected traffic needs		• Provides enough capacity for projected traffic needs	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a road capacity perspective because both alternatives will provide the same road capacity and will meet protected traffic needs for Block 27
Design Standard Compliance	Compliance with City and Regional design standards		• Complies with City and Regional design standards		• Complies with City and Regional design standards	

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
	Meets accessibility standards (AODA)	●	• Meets accessibility standards (AODA)	●	• Meets accessibility standards (AODA)	• Maximum slope of the road is 2.5% or less. There is not significant difference between options, therefore there is no preferred option
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)	◑	• Provides some flexibility to accommodate future designs • Connects to Jane Street at the NVNCTMP location to accommodates a direct connection Block 34E	◑	• Provides some flexibility to accommodate future designs • Connects to Jane Street at the NVNCTMP location to accommodates a direct connection Block 34E	
	GHG emissions	◑	• Difference in GHG emissions is negligible	◑	• Difference in GHG emissions is negligible	
	Sub-Category Assessment		◑		◑	**Alternatives 3A and 3B** are preferred equally from a design standard compliance perspective because both alternatives meet all design standards and have the ability to accommodate future designs and emerging technologies
Community Connectivity	Provides enhanced connections to major destinations for all modes	◕	• Provides opportunities for vehicles, transit and active transportation movements across the entire end to end roadway • Would result in one additional intersection along Collector Street 6 due to its T-intersection at Alternative 7A	◑	• Provides opportunities for vehicles, transit and active transportation movements across the entire end to end roadway • Would result in one less connection point along Collector Street 6 due to its direct connection with Alternative 7B (one continuous road) • Straighter alignment increases permeability for cyclists and pedestrians	
	Contributes to flexibility of the network to allow for better access/service	◕	• Provides alternative east-west route across the study area	◕	• Provides alternative east-west route across the study area	
	Aligns with fine-grained network of streets (local, collector, and arterial)	◑	• Provides connections to most north-south streets in Block 27 • Create as swooping curve that does not allow for an efficient grid-like pattern	◕	• Provides connections to most north-south streets in Block 27 • Allows for a more efficient grid-like road pattern, which adheres to urban design principles	
	Sub-Category Assessment		◕		◕	**Alternatives 3A and 3B** are preferred equally from a community connectivity perspective for the following reasons: • Both alternatives would support transit, provide sufficient road capacity for future traffic, and adheres with design standards/guidelines • Alternative 3A provides an additional intersection to Collector Street 6, however the alignment does not allow for an efficient grid-like road pattern • Alternative 3B allows for a more efficient grid-like road pattern, however, it has one less connection

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
			point along Collector Street 6 which decreases connectivity			
Overall Category Ranking						**Alternative 3B** is preferred from a Transportation perspective for the following reasons: • Traverses through less environmentally sensitive lands which increases the developable land / land-uses adjacent to the road (increases points of interest for AT users) • Allows for a more efficient grid-like road pattern, which adheres to urban design principles
Natural Environment						
Fish/Fish Habitat	Potential Impacts to fish or fish habitat		• Alternative 3A has the potential for negative effects on fish habitat through crossing of a 40 m long reach of DF3 identified as direct fish habitat • No direct fish habitat impacted by road crossing along DF1 and DF4		• Alternative 3B has the potential for negative effects on fish habitat through crossing of a 40 m long reach of DF3 identified as direct fish habitat, however, the crossing only occurs at the northern edge of direct fish habitat and therefore has a lesser impact than Alternative 3A. • No direct fish habitat impacted by road crossing along DF1 and DF4	
	Level of opportunity to mitigate / minimize impact to fish and fish habitat		• Appropriate open-bottom culvert design with unwetted natural banks on both side of watercourse		• Appropriate open-bottom culvert design with unwetted natural banks on both side of watercourse	
	Sub-Category Assessment					**Alternative 3B** is preferred from a fish and fish habitat perspective for the following reasons: • Watercourse crossing for Alternative 3B only occurs at the upstream end of DF3 fish habitat
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation		• Wetland vegetation negatively affected as part of PSW removal (0.49 ha) and removal of portions of treed hedgerows		• Wetland vegetation negatively affected as part of PSW removal (0.21 ha), woodland removal (0.1 ha) and removal of portions of treed hedgerows	
	Impacts to wildlife and wildlife habitat		• Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows • Habitat for amphibians (Spring Peeper, Wood Frog, American Toad), small mammals and common wetland bird species (Red-winged Blackbird, Swamp Sparrow, Yellow Warbler) provided by 0.49 ha of meadow marsh and shallow marsh proposed for removal		• Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of woodland and hedgerows • Habitat for amphibians (Spring Peeper, Wood Frog, American Toad), small mammals and common wetland bird species (Red-winged Blackbird, Swamp Sparrow, Yellow Warbler) provided by 0.21 ha of meadow marsh and shallow marsh proposed for removal	

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
	Potential Impacts to wildlife due to environmental fragmentation	○	• Disturbance including potential interference with north-south wildlife movement along the road alignment, notably at crossings with drainage features DF1, DF3 and DF4 • Fragmentation of two units (2.3 ha and 3 ha) of the PSW into smaller units • Disruption of linkage function through construction of a road between wetland units of the PSW located along drainage features.	○	• Disturbance including potential interference with north-south wildlife movement along the road alignment, notably at crossings with drainage features DF1, DF3 and DF4 • Fragmentation of a unit (2.3 ha) of the PSW into smaller units • Disruption of linkage function through construction of a road between wetland units of the PSW located along drainage features.	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	●	• Ecosystem restoration to recreate suitable habitat for wildlife • Appropriate open-bottom culvert design with unwetted natural banks on both side of watercourse to accommodate wildlife passage (amphibians, reptiles, small mammals)	●	• Ecosystem restoration to recreate suitable habitat for wildlife • Appropriate open-bottom culvert design with unwetted natural banks on both side of watercourse to accommodate wildlife passage (amphibians, reptiles, small mammals)	
	Sub-Category Assessment					**Alternative 3B** is preferred from a vegetation, wildlife, and wildlife habitat perspective for the following reasons: • Requires 0.28ha less removal of PSW/woodland / wildlife habitat • Large PSW (3.0ha) along DF3 not fragmented
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to the Greenbelt	◑	• Impacts 0.69 ha of Greenbelt	◑	• Impacts 0.75 ha of Greenbelt	
	Impacts to Provincially Significant Wetlands	○	• Alternative 3A involves the removal of approximately 0.49 ha of PSW and 0.81 ha of associated 30 m buffer	◑	• Alternative 3B involves the removal of approximately 0.21 ha of PSW and 1.07 ha of associated 30 m buffer	
	Impacts to Significant Woodland	◑	• No Significant Woodland negatively affected.		• Alternative 3B involves the removal of approximately 0.1 ha of Significant Woodland and 0.13 ha of associated 30 m buffer	
	Impacts to Significant Wildlife Habitat	◑	• No SWH negatively affected	◑	• No SWH negatively affected	
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland	
	Sub-Category Assessment					**Alternative 3B** is preferred from a designated natural heritage features and environmentally sensitive areas perspective for the following reasons: • Minimizes impacts to the PSW • Although Alternative 3B requires minor removals of significant woodland which is avoided with Alternative 3A, Alternative 3B was preferred

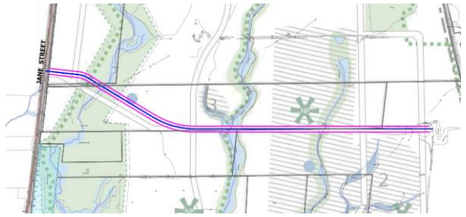
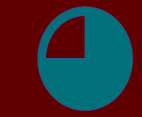
Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						because avoiding impacts to PSW and Greenbelt is more significant
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◑	• No rare species have been recorded within footprint	◑	• No rare species have been recorded	
	Impacts to Species of Conservation Concern and their habitat	◑	• No negative effects to Species of Concern	◑	• No negative effects to Species of Concern	
	Impacts to Endangered or Threatened or Threatened Species and their habitat	◑	• No endangered or threatened species been recorded within footprint of Alternative 3A • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	◑	• No endangered or threatened species been recorded within footprint of Alternative 3B • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	• Additional targeted search for Butternut trees (*Juglans cinerea*) will be required at later stages in portions of woodland and treed hedgerow proposed for removal • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements
	Sub-Category Assessment		◑		◑	**Alternative 3A and 3B** are preferred equally from a rare species, species of conservation concern, and SAR perspective because there are no endangered or threatened species been recorded within the footprint of either alternative
	Overall Category Ranking		◑		◔	**Alternative 3B** is preferred from an overall Natural Environment perspective for the following reasons: • Minimizes encroachment into wetland designated PSW (requires 0.28 ha less removal of PSW) • Avoids fragmentation of the large PSW (3.0ha) along DF3
Hydrogeology & Drainage						
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources	◔	• Alternative 3A avoids the area mapped as having highly vulnerable aquifers • No significant impact to groundwater quality anticipated with BMPs in place for road salt management	◑	• Alternative 3B crosses through an area mapped as having highly vulnerable aquifers; however, with BMPs in place for road salt management, no significant impact to water quality anticipated	
	Potential to affect the quantity of groundwater resources	◑	• No significant impact to recharge anticipated from road construction	◑	• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources	◑	• No anticipated impact to groundwater movement	◑	• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area	◑	• Alternative 3A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	◑	• Alternative 3B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
	Potential to affect drinking water	◑	• Area will be municipally serviced for drinking water	◑	• Area will be municipally serviced for drinking water	
	Sub-Category Assessment		◑		◑	**Alternatives 3A and 3B** are preferred equally from a hydrogeology / ground water perspective because no significant impact to water quality is anticipated with either alternative with BMPs in place for road salt management
Surface Water and Drainage	Potential to affect surface water quality and quantity	◑	• Longer road length, therefore more impact on surface water quality and quantity (Length = 1776m)	◕	• Shorter length of road and therefore less impact on surface water quality and quantity (Length = 1400 m)	
	Provides sufficient drainage and treatment	◑	• Quantity and quality control of runoff is being provided by SWM ponds	◑	• Quantity and quality control of runoff is being provided by SWM ponds	
	Sub-Category Assessment		◑		◕	**Alternative 3B** is preferred from a surface water and drainage perspective as it has the least impact on the quality and quantity of run-off
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))	◑	• Three (3) crossings are required	◑	• Three (3) crossings are required	
	Sub-Category Assessment		◑		◑	**Alternatives 3A and 3B** are preferred equally from a floodplain perspective because both alternatives require three (3) crossings
Overall Category Ranking			◑		◑	**Alternatives 3A and 3B** are preferred from an overall Hydrogeology and Drainage perspective for the following reasons: • No significant impact to water quality is anticipated with either alternative with BMPs in place for road salt management • Quantity and quality control of runoff will be provided by SWM ponds for both alternatives • Same number of floodplain crossings will be required
Socio-Economic Environment						
Land-use Policy Compliance	Conformity with Provincial, Regional, and municipal land-use policy objectives	◔	• Creates a large swooping curve that creates more inefficient lotting patterns and would result in more curved local roads and irregular lots which results in a less efficient road pattern and creates inefficiencies in urban land. This inconsistent with the PPS and does not conform to the Growth Plan, York Region Official Plan and Vaughan Official Plan, all of which	◕	• Allows for an efficient road pattern, which is consistent with the PPS and conforms to the Growth Plan, York Region Official Plan and Vaughan Official Plan, all of which require the optimization of development on urban land. • Minimizes impacts to PSW and the Greenbelt • Street 3 connection to Street 7 does not comply with the Block 27 Secondary Plan location	

Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
			require the optimization of development on urban land			
	Sub-Category Assessment					**Alternative 3B** is preferred from a policy compliance perspective for the following reasons: • Allows for an efficient road pattern, which is consistent wit the PPS, Growth Plan, and Regional and Municipal Official Plans • Minimizes impacts to PSW and Greenbelt
Future Land Uses	Level of service to proposed land uses		• Provides access to all proposed land uses		• Provides access to all proposed land uses	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a future land use perspective
Impacts to Non-Participating Properties	Number of impacted properties that would need to be acquired		• Entire road alignment is on participating landowner properties		• Entire road alignment is on participating landowner properties	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from an impact to non-participating properties perspective because both alternatives remain on participating landowner properties
Noise and Air Quality Impact	Impacts on noise and vibration sensitive receptors		• No sensitive receptors within the vicinity of the road alignment		• No sensitive receptors within the vicinity of the road alignment	
	Impacts on air quality		• The majority of the study area consists of agricultural land with no existing receptors within the vicinity of Alternative 3A		• The majority of the study area consists of agricultural land with no existing receptors within the vicinity of Alternative 3B	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a noise and air quality perspective because both alternatives are not within the vicinity of any non-participating properties
Overall Category Ranking						**Alternative 3B** is preferred from an overall Socio-Economic Environment perspective for the following reasons: • More consistent wit the PPS, Growth Plan, and Regional and Municipal Official Plans compared to Alternative 3A • Minimizes impacts to PSW and Greenbelt and is more consistent with the Greenbelt Plan
Cultural Environment						

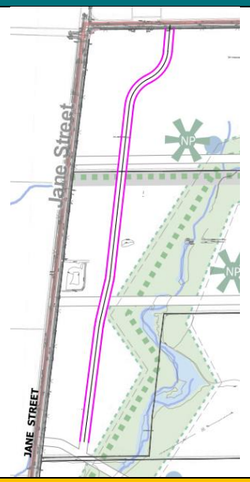
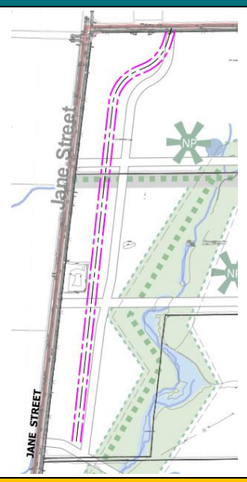
Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost • Disruption to a small section of the southern section of municipally listed cultural heritage landscape (CHL 1), however, CHLs will be removed as a result of the development		• No built heritage resources (BHR) lost • Disruption to a small section of the southern section of municipally listed cultural heritage landscape (CHL 1), however, CHLs will be removed as a result of the development	• These alternatives only impact the lower section of the identified CHL 1 for a short distance, however, CHLs will be removed as a result of the development • Opportunities to supports commemoration of Indigenous and Euro-Canadian settlement in Vaughan Township
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • Both alternatives do not impact any other known cultural heritage resources • Impacts to CHL 1 were not considered because the CHL will be removed as a result of the development • Both alternatives can support a commemorative heritage program.
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential		• Stage 2 assessment will be required for Parcel 9 • Engagement will be required during fieldwork		• Stage 2 assessment will be required for Parcel 9 • Engagement will be required during fieldwork	• Both alignments originate in Parcel 9, neither alignment intersect with areas that require further work outside of parcel 9.
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from an Archaeological Resources perspective for the following reasons: • Both alignments originate in Parcel 9, and neither alignment intersect with areas that require further archaeological assessment outside of parcel 9. • No material difference between alignments. • Indigenous Nations will be engaged for all fieldwork
Overall Category Ranking						**Alternatives 3A and 3B** are preferred equally from an overall Cultural Environment perspective for the following reasons: • No built heritage resources (BHR) are impacted with either alternative • Further Stage 2 archaeological assessment will be required on Parcel 9 for both alternatives
Cost & Constructability						
	Ease of Construction		• Longer road length • Requires three (3) crossings		• Shorter road length • Requires three (3) crossings	

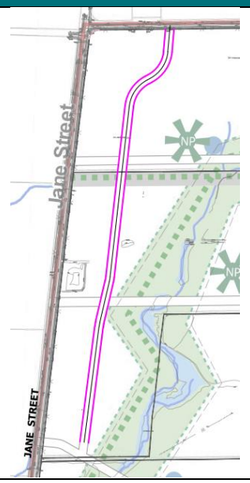
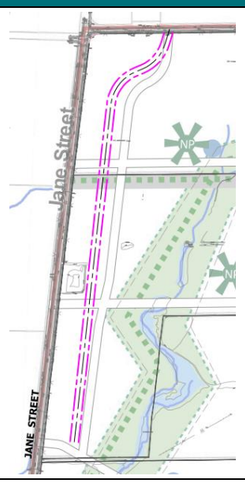
Evaluation Criteria		Alternative 3A		Alternative 3B		Comments / Rationale
						
Engineering Feasibility and Construction Cost	Cost effectiveness to build		• Higher construction costs due to longer road length • Cost of constructing three crossings will be similar		• Lower construction costs due to shorter road length • Cost of constructing three crossings will be similar	
	Cost of compensation for impacts to the natural environment		• Slightly lower encroachment is proposed onto the NHS and buffer; however, 3 wetlands are encroached and approximately 0.19 ha of wetland area is additionally disturbed compared to Alternative 3B		• Slightly larger encroachment is proposed onto the NHS and buffer, however only 2 wetlands are encroached, and wetland encroachment is lower by 0.19 ha	
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development		• Construction works can be phased		• Construction works can be phased	
	Sub-Category Assessment					**Alternative 3B** is preferred from an engineering feasibility and construction cost perspective for the following reasons: • Shorter road length, therefore lower construction costs • Less wetland encroachment, therefore less compensation is required
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)		• Requires relocation of existing utilities along Jane Street in both options		• Requires relocation of existing utilities along Jane Street in both options	
	Impacts on existing municipal infrastructure		• Requires relocation of existing utilities along Jane Street in both options		• Requires relocation of existing utilities along Jane Street in both options	
	Sub-Category Assessment		• Requires relocation of existing utilities along Jane Street in both options		• Requires relocation of existing utilities along Jane Street in both options	**Alternatives 3A and 3B** are preferred equally from an existing municipal infrastructure and utilities perspective because both alternatives require the same relocation of existing utilities along Jane Street
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)		• Capital costs are expected to be higher as the length of the road is longer in this alternative		• Capital costs are expected to be slightly lower as length of the road shorter in this alternative	
	Sub-Category Assessment		• Capital costs are expected to be higher as the length of the road is longer in this alternative.		• Capital costs are expected to be slightly lower as length of the road shorter in this alternative.	**Alternative 3B** is preferred from a capital cost perspective because of the lower cost due to shorter road length
Property Costs	Scale of property costs (relative scale-preferred to least preferred)		• Road alignment do not require non-participating land owner property		• Road alignment do not require non-participating land owner property	
	Sub-Category Assessment					**Alternatives 3A and 3B** are preferred equally from a property cost perspective because non-participating land owner property is not required
Operating and Maintenance Costs	Operating and maintenance costs		• Higher operating and maintenance costs are expected due to longer length of the proposed road		• Lower operating and maintenance costs are expected due to shorter length of the proposed road	

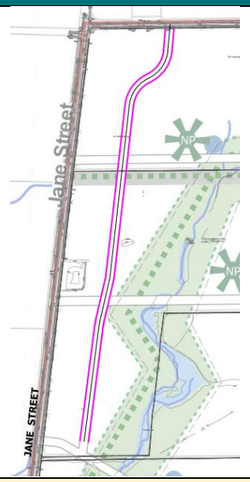
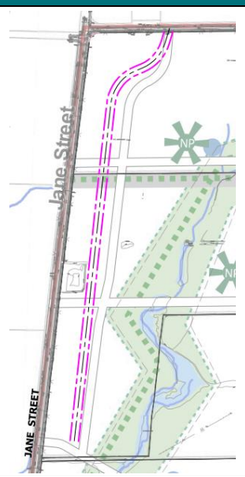
Evaluation Criteria		Alternative 3A	Alternative 3B	Comments / Rationale
				
	Sub-Category Assessment			**Alternative 3B** is preferred from an operating and maintenance costs perspective as it expected to have a lower operating and maintenance costs due to shorter road length.
	Overall Category Ranking			**Alternative 3B** is preferred from an overall Cost & Constructability perspective for the following reasons: • Expected to have lower operating and maintenance costs due to shorter road length
OVERALL EVALUATION				**Alternative 3B was selected as the preferred Street 3 alternative based on the evaluation of the natural, socio-economic, cultural environments, and technical considerations for the following reasons:** • It allows for an efficient grid-like design that allows for uniform building envelopes • Minimizes encroachment into wetland designated PSW (requires 0.28 ha less removal of PSW) • Avoids fragmentation of the large PSW (3.0ha) along DF3 • Shorter length of roads results of less impacts on surface water quality and quantity • More consistent wit the PPS, Growth Plan, and Regional and Municipal Official Plans compared to Alternative 3A • Further away from noise sensitive areas within the vicinity of the roadway which minimizes potential noise and air quality impacts • Expected to have lower operating and maintenance costs due to shorter road length

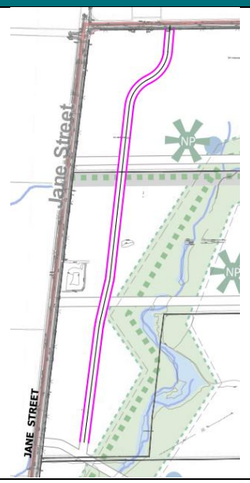
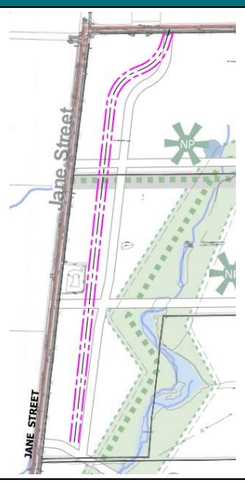
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 4)

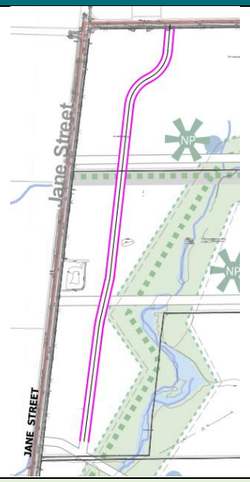
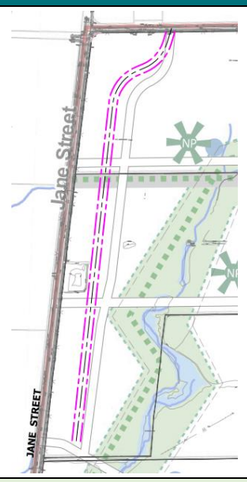
Legend: ○ ◔ ◑ ◕ ● — Least Benefits / Most Impacts → Most Benefits / Least Impacts

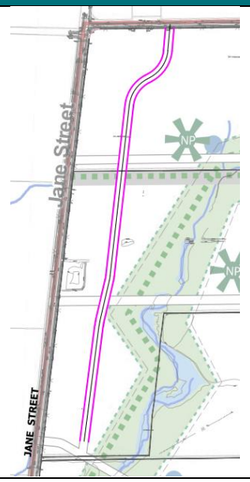
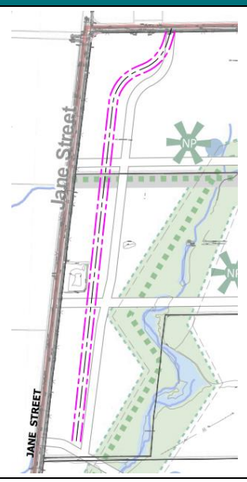
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route	◑	• Street 4 is not identified as a future transit route, as such, a neutral ranking has been assigned	◑	• Street 4 is not identified as a future transit route, as such, a neutral ranking has been assigned	Street 4 is not identified as a future transit route, as such, a neutral ranking has been provided
	Sub-Category Assessment		◑		◑	**Alternatives 4A and 4B** will not be a future transit route, as such, a neutral ranking has been provided
Supports Active Transportation	Encourages active transportation	◕	• Provides active transportation facilities for the proposed low-rise mixed-use and low-rise residential proposed within the vicinity of Collector Street 4 connecting active transportation users to Kirby Road and Collector Streets 2 and 3	◕	• Provides active transportation facilities for the proposed low-rise mixed-use and low-rise residential proposed within the vicinity of Collector Street 4 connecting active transportation users to Kirby Road and Collector Streets 2 and 3	
	Considers pedestrian/cyclist safety	◕	• Provides safe facilities for both pedestrians and cyclists	◕	• Provides safe facilities for both pedestrians and cyclists	
	Sub-Category Assessment		◕		◕	**Alternative 4A and 4B** are preferred equally from an active transportation perspective for the following reasons: • Provides active transportation facilities for the proposed low-rise mixed-use and low-rise residential proposed within the vicinity of Collector Street 4
Road Capacity	Provides sufficient road capacity for the projected traffic needs	●	• Roadway has sufficient road capacity for the projected traffic needs	◔	• Roadway has sufficient road capacity for the projected traffic needs • Intersection distances between Alternative 4B and Collector Streets 1, 2, and 3 are less than the	<table><tr><th rowspan="2">Intersection</th><th rowspan="2">Note</th><th rowspan="2">Mvt</th><th colspan="2">95th Queue (m)</th></tr><tr><th>AM</th><th>PM</th></tr><tr><td>Street 4 & Street 1</td><td>Inbound from Jane</td><td>EBLTR</td><td>16</td><td>18</td></tr></table>

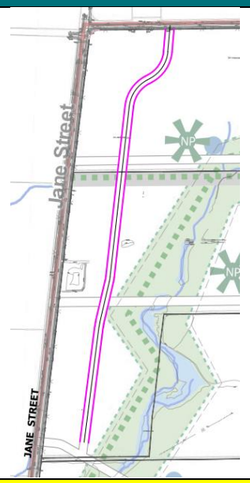
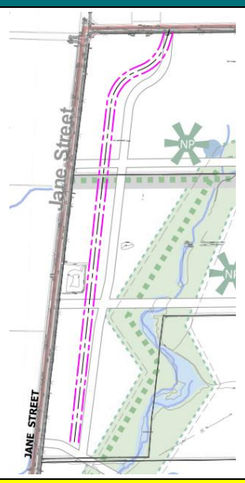
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
			• Provides sufficient spacing between Jane Street for Collector Roads 1, 2 and 3 which avoids traffic queuing through the intersection		recommended distance and traffic modelling indicates some back-up through the intersection is anticipated • Vehicles seeking to leave Block 27 in the mornings would back up through the intersections with Street 4	<table><tr><td>Street 4 & Street 2</td><td>Inbound from Jane</td><td>EBLTR</td><td>15</td><td>22</td></tr><tr><td>Street 4 & Street 3</td><td>Inbound from Jane</td><td>EBLT</td><td>17</td><td>28</td></tr><tr><td rowspan="2">Jane St. & Street 1</td><td rowspan="2">Outbound to Jane</td><td>WBL</td><td>48</td><td>36</td></tr><tr><td>WBR</td><td>92</td><td>32</td></tr><tr><td rowspan="2">Jane St. & Street 2</td><td rowspan="2">Outbound to Jane</td><td>WBL</td><td>44</td><td>39</td></tr><tr><td>WBR</td><td>97</td><td>14</td></tr><tr><td rowspan="2">Jane St. & Street 3</td><td rowspan="2">Outbound to Jane</td><td>WBL</td><td>46</td><td>35</td></tr><tr><td>WBR</td><td>94</td><td>29</td></tr></table>
	Sub-Category Assessment					**Alternative 4A** is preferred from a road capacity perspective for the following reasons: • Provides sufficient road capacity and intersection spacing to avoid traffic queuing from Jane St. to Collector Streets 1, 2 and 3
Design Standard Compliance	Compliance with City and Regional design standards		• Does not meet the City's design guidelines to provide require 20 m (min.) straight ROW beyond curves		• Intersection distances between Alternative 4B and Collector Streets 1, 2, and 3 are less than the recommended distance	
	Meets accessibility standards (AODA)		• Meets AODA standards		• Meets AODA standards	• Maximum slope of the road is 2.5% or less. There is not significant difference between options, therefore there is no preferred option
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)		• Provides flexibility to accommodate future designs • There are no known concerns with accommodating the recommended plan for the City's Kirby Road Widening EA		• Provides flexibility to accommodate future designs • There are no known concerns with accommodating the recommended plan for the City's Kirby Road Widening EA	
	GHG Emissions		• Difference in GHG emissions is negligible		• Difference in GHG emissions is negligible	
	Sub-Category Assessment					**Alternatives 4A and 4B** are equally preferred from a design standard compliance perspective for the following reasons: • Both alternatives do not comply with City's design standards; Alternative 4A does not meeting the City's design guideline to provide 20 m straight

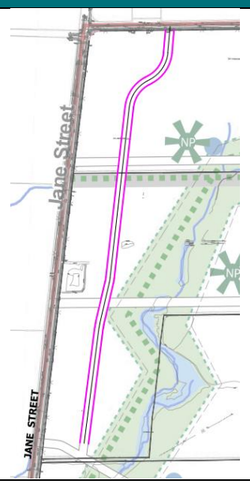
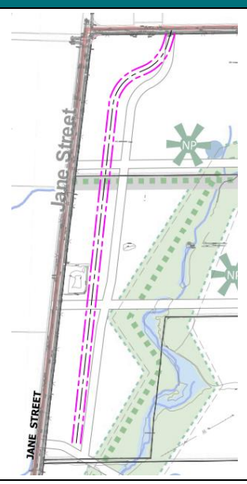
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
						ROW beyond curves while Alternative 4B does not meet required intersection distances
Community Connectivity	Provides enhanced connections to major destinations for all modes	◑	• Provides opportunities for vehicles and active transportation movements across the entire end to end roadway	◑	• Provides opportunities for vehicles and active transportation movements across the entire end to end roadway	
	Contributes to flexibility of the network to allow for better access/service	◕	• Provides a north-south route across the study area	◕	• Provides a north-south route across the study area	
	Aligns with fine-grained network of streets (local, collector, and arterial)	◕	• Transects with all east to west roads within Block 27	◕	• Transects with all east to west roads within Block 27	
	Sub-Category Assessment		◕		◕	**Alternatives 4A and 4B** are preferred equally from a community connectivity perspective because both alternatives provide the same connections for all modes of transportation
Overall Category Ranking			◕		◑	**Alternative 4A** is preferred from an overall Transportation perspective for the following reasons: • Provides sufficient road capacity and intersection spacing to avoid traffic queuing from Jane St. to Collector Streets 1, 2 and 3
Natural Environment						
Fish and Fish Habitat	Impacts to Fish and Fish Habitat	◑	• N/A: there are no fish and fish habitat within the vicinity of either Street 4 road alignments, as such, a neutral ranking has been assigned	◑	• N/A: there are no fish and fish habitat within the vicinity of either Street 4 road alignments, as such, a neutral ranking has been assigned	
	Level of opportunity to mitigate / minimize impact to fish and fish habitat	◑	• N/A: there are no fish and fish habitat within the vicinity of either Street 4 road alignments, as such, a neutral ranking has been assigned	◑	• N/A: there are no fish and fish habitat within the vicinity of either Street 4 road alignments, as such, a neutral ranking has been assigned	
	Sub-Category Assessment		◑		◑	**Alternatives 4A and 4B** are preferred equally from a fish and fish habitat perspective because there are no fish and fish habitat within the vicinity of either Street 4 road alignments and there are no impacts
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation	◑	• Removal of planted trees in anthropogenic areas	◑	• Removal of planted trees in anthropogenic areas	

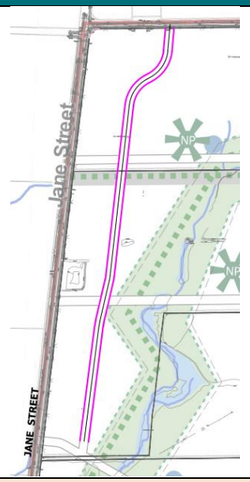
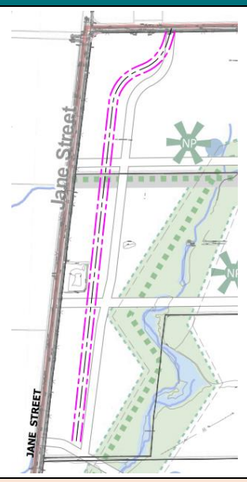
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
	Impacts to wildlife and wildlife habitat	◑	• Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed planted trees in anthropogenic areas	◑	• Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed planted trees in anthropogenic areas	
	Impacts to wildlife due to environmental fragmentation	◑	• No major disturbance to wildlife movement anticipated due to proximity with Jane Street and absence of natural features in between Jane Street and Alternative 4A	◑	• No major disturbance to wildlife movement anticipated due to proximity with Jane Street and absence of natural features in between Jane Street and Alternative 4B	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	◑	• Standard mitigation measures can be implemented to minimize impacts	◑	• Standard mitigation measures can be implemented to minimize impacts	
	Sub-Category Assessment		◑		◑	**Alternatives 4A and 4B are** preferred equally from a vegetation, wildlife, and wildlife habitat perspective for the following reasons: • Impacts are limited to planted trees in anthropogenic areas • No major disturbance to wildlife movement anticipated due to proximity with Jane Street and absence of natural features in between Jane Street and Alternative 4B
	Impacts to Provincially Significant Wetlands	◑	• No anticipated impacts to PSW	◑	• No anticipated impacts to PSW	
	Impacts to Significant Woodland	◑	• No anticipated impacts to Significant Woodland	◑	• No anticipated impacts to Significant Woodland	
	Impacts to Significant Wildlife Habitat	◑	• No anticipated impacts to Significant Wildlife Habitat	◑	• No anticipated impacts to Significant Wildlife Habitat	
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas	◑	• No anticipated impacts	◑	• No anticipated impacts	
	Sub-Category Assessment		◑		◑	• **Alternatives 4A and 4B are** preferred equally from a designated natural heritage features and

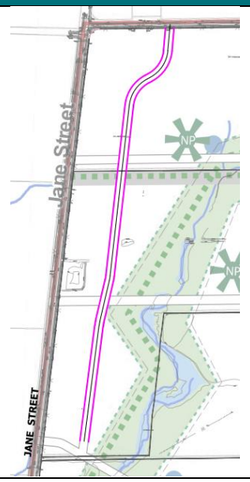
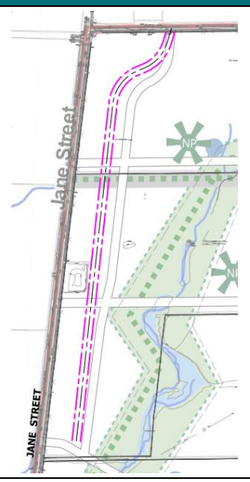
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						environmentally sensitive areas perspective because there are no environmentally sensitive areas impacted by either alternative
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◑	• No rare species have been recorded	◑	• No rare species have been recorded	
	Impacts to Species of Conservation Concern and their habitat	◑	• No anticipated impacts to Species of Concern anticipated	◑	• No anticipated impacts to Species of Concern	
	Impacts to Endangered or Threatened Species and their habitat	◑	• No endangered and threatened species been recorded within footprint	◑	• No endangered or threatened species been recorded within footprint	
	Sub-Category Assessment		◑		◑	• **Alternatives 4A and 4B are** preferred equally from a rare species, species of conservation concern, and endangered and threatened species perspective because there are no effects and difference between alternatives
	Overall Category Ranking		◑		◑	**Alternatives 4A and 4B are** preferred equally from an overall Natural Environment perspective because there are no sensitive or protected natural environmental features impacted by either alternative
Hydrogeology and Drainage						
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources	◑	• Alternative 4A is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	◑	• Alternative 4B is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources	◑	• No significant impact to recharge anticipated from road construction	◑	• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources	◑	• No anticipated impact to groundwater movement	◑	• No anticipated impact to groundwater movement	

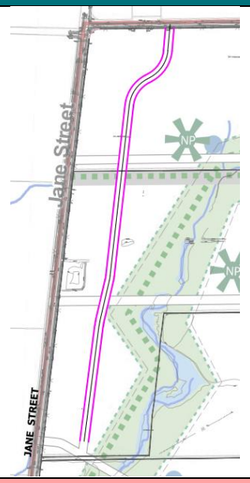
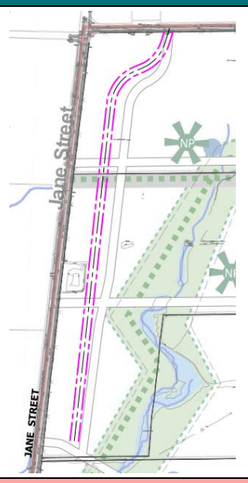
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
	Potential to affect Wellhead Protection / Recharge Area	◑	• Alternative 4A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	◑	• Alternative 4B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water	◑	• Area will be municipally serviced for drinking water	◑	• Area will be municipally serviced for drinking water	
	Sub-Category Assessment		◑		◑	**Alternatives 4A and 4B are** preferred equally from a hydrogeology / ground water perspective because no significant impacts are anticipated for any of the alternatives.
Surface Water and Drainage	Potential to affect surface water quality and quantity	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity	
	Provides sufficient drainage and treatment	◑	• Quantity and quality control of runoff is being provided by SWM ponds	◑	• Quantity and quality control of runoff is being provided by SWM ponds	
	Sub-Category Assessment		◑		◑	• From a surface water and drainage perspective, there is no preferred option as both the options are similar in length.
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))	●	• No floodplain encroachment is proposed in either of the options.	●	• No floodplain encroachment is proposed in either of the options.	
	Sub-Category Assessment		●		●	• No floodplain encroachment is proposed in either of the options.
Overall Category Ranking			◔		◔	**Alternatives 4A and 4B** are preferred equally from an overall Hydrogeology / Drainage perspective for the following reasons: • No significant impacts are anticipated to quality or quantity of groundwater resources • Similar length of road between both the alternatives, therefore similar impact on surface water and drainage • No floodplain encroachment is proposed in either of the options

Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
Socio-Economic Environment						
Land-Use Policy Compliance	Conformity with Provincial, Regional, and municipal Land-Use policy objectives	◔	• Distance between Jane Street and Alternative 4A creates additional development constraints but is not detrimental insofar as there are no significant areas that are undevelopable • Generally conforms to the Growth Plan, York Region Official Plan and Vaughan Official Plan (i.e., optimization of development on urban land)	●	• Provides road spacing which maximizes the development potential adjacent to the road, which is consistent with the PPS and conforms to the Growth Plan, York Region Official Plan and Vaughan Official Plan, all of which require the optimization of development on urban land • Accommodates a more efficient land-use layout • Road creates a boundary between differing densities (e.g., transition, buffer)	
	Sub-Category Assessment		◔		●	**Alternative 4B** is preferred from a land-use policy compliance perspective for the following reasons: • Provides road spacing which maximizes the development potential adjacent to the road which is consistent with the PPS and conforms to the Growth Plan, York Region Official Plan and Vaughan Official Plan
Future Land Uses	Level of service to proposed land uses	◕	• Sufficient LOS is proposed for each land use	◕	• Sufficient LOS is proposed for each land use	
	Sub-Category Assessment		◕		◕	**Alternatives 4A and 4B** are preferred equally from a future land use perspective as both alternatives will provide sufficient level of service to the proposed surrounding land uses
Non-Participating Property Impacts	Number of impacted properties that would need to be acquired	◑	• One non-participating landowner • There is potential to avoid direct impacts to residential / existing buildings, however the road would be disruptive	○	• One non-participating landowner • Will result in directly impacts the residential and farm structures on the property	
	Sub-Category Assessment		◑		○	**Alternative 4A** is preferred from a non-participating property impact perspective because there is potential to avoid direct impacts to the existing residential and farm structures on the non-participating land owner property

Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
Noise and Air Quality Impact	Impacts on noise and vibration sensitive receptors		• Road alignment is directly adjacent to the residential noise sensitive receptor (29 Kirby Rd.)		• Road alignment directly impacts residential / farm structures (29 Kirby Rd.) and displaces the NSA, thereby removing potential noise impacts to the NSA	Alternative 4A may result in the displacement of the NSA, however, the evaluation is taking a conservative approach and assuming residential building can be maintained
	Impacts on air quality		• Road alignment is directly adjacent to the residential air quality sensitive receptor		• Road alignment directly impacts residential / farm structures and as a result, displaces sensitive receptor	Alternative 4A may result in the displacement of the NSA, however, the evaluation is taking a conservative approach and assuming residential building can be maintained
	Sub-Category Assessment					**Alternative 4B** is preferred from a noise and air quality impact perspective because the road displaces the NSA and removes noise and air quality impacts
Overall Category Ranking						**Alternative 4B** is preferred from an overall Socio-Economic Environment perspective for the following reasons: • Allows for an efficient road pattern which optimizes the development on urban land
Cultural Environment						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost • Disruption to municipally listed cultural heritage landscape CHL 1 and a Potential Cultural Heritage Resource CHL 2, however, CHL's are anticipated to be removed as a result of the development		• Built heritage resources may potentially be lost though displacement impact • Disruption to municipally listed cultural heritage landscape CHL 1 and a Potential Cultural Heritage Resource CHL 2, however, CHL's are anticipated to be removed as a result of the development	• Alt. 4A will result in contextual change to identified CHLs • 4B results in the loss of both BHRs and CHLs. A higher displacement rating occurs because of this impact • Opportunities to support a commemorative heritage interpretation program celebrating Indigenous and Euro-Canadian settlement
	Sub-Category Assessment					**Alternative 4A** is preferred from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • Avoid impacts to a BHR • Fewer identified impacts related to the displacement of built heritage resources and for

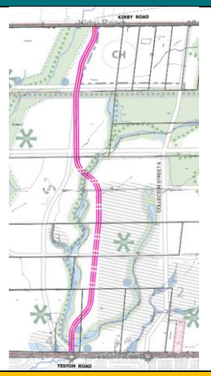
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						CHL 1 and 2, however, CHLs are anticipated to be removed as a result of the development • Opportunities exist to support a commemorative heritage program.
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential	◑	• Stage 2 assessment will be required for Parcel 10 • Indigenous Nation engagement will be required during fieldwork	◑	• Stage 2 assessment will be required for Parcel 10 • Indigenous Nation engagement will be required during fieldwork	• Both alignments originate in Parcel 10, neither alignment intersect with areas that require further work outside of parcel 10.
	Sub-Category Assessment		◑		◑	**Alternatives 4A and 4B** are preferred equally from an Archaeological Resources perspective for the following reasons: • Both alignments originate in Parcel 10 and neither alignment intersect with areas that require further archaeological assessment outside of parcel 10 • No material difference between alignments
Overall Category Ranking			◕		◕	**Alternative 4A** is preferred from an overall Cultural Environment perspective for the following reasons: • Avoid impacts to a build-heritage resource • Fewer identified impacts related to the displacement of built heritage resources and for CHL 1 and 2, however, CHLs are anticipated to be removed as a result of the development
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction	◑	• Similar road lengths, therefore there is no preferred option	◑	• Similar road lengths, therefore there is no preferred option	
	Cost effectiveness to build	◑	• Similar road length, therefore there is no preferred option	◑	• Similar road length, therefore there is no preferred option	
	Cost of compensation for impacts to the natural environment	◑	• No encroachments onto natural areas, therefore no compensation is required	◑	• No encroachments onto natural areas, therefore no compensation is required	

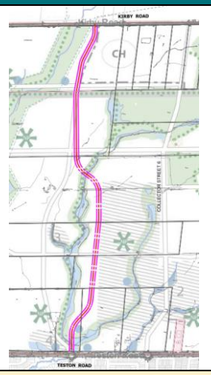
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development		• Construction works can be phased		• Construction works can be phased	
	Sub-Category Assessment					• **Alternatives 4A and 4B** are preferred equally from an engineering feasibility and construction cost perspective because the road lengths are similar and there are no encroachments into sensitive natural areas.
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)		• Requires crossing TCE pipeline and requires relocation of existing utilities along Kirby Road in both alternatives		• Requires crossing TCE pipeline and requires relocation of existing utilities along Kirby Road in both alternatives	
	Impacts on existing municipal infrastructure		• Requires crossing TCE pipeline and requires relocation of existing utilities along Kirby Road in both alternatives		• Requires crossing TCE pipeline and requires relocation of existing utilities along Kirby Road in both alternatives	
	Sub-Category Assessment					• **Alternatives 4A and 4B** are preferred equally from an existing municipal infrastructure and utilities perspective because both alternatives require a TCE pipeline crossing and relocation of existing utilities along Kirby Road
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)		• Capital costs are expected to same in both the alternatives.		• Capital costs are expected to same in both the alternatives	
	Sub-Category Assessment					• **Alternatives 4A and 4B** are preferred equally from a capital cost perspective because capital costs are expected to same in both the alternatives
Property Costs	Scale of property costs (relative scale-preferred to least preferred)		• Similar length of road is proposed on non-participating landowner in both alternatives, however, impacts to the residential building is avoided		• Similar length of road is proposed on non-participating landowner in both alternatives • Displacement of existing residential property	
	Sub-Category Assessment					• **Alternative 4A** is preferred from a property acquisition perspective because there is potential to avoid direct impacts to the existing residential

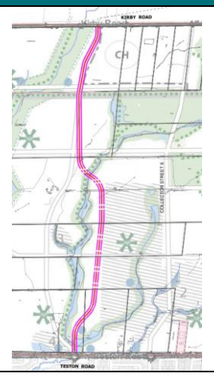
Evaluation Criteria		Alternative 4A		Alternative 4B		Comments / Rationale
						
						and farm structures on the non-participating landowner property
Operating and Maintenance Costs	Operating and maintenance costs	◑	• Operating and maintenance costs are expected to be the same in both the alternatives due to similar lengths	◑	• Operating and maintenance costs are expected to be the same in both the alternatives due to similar lengths	
	Sub-Category Assessment		◑		◑	• **Alternatives 4A and 4B** are preferred equally from an operating and maintenance costs perspective because operating and maintenance costs are expected to be the same in both alternatives.
Overall Category Ranking			◔		◑	**Alternative 4A** is preferred from an overall cost & constructability perspective for the following reasons: • Potentially avoids direct impacts to the existing residential building / structures on the non-participating landowner property
OVERALL EVALUATION			◔		◑	**Alternative 4A was selected as the preferred Street 4 alternative for the following reasons:** • Provides sufficient road capacity and intersection spacing to avoid traffic queuing from Jane St. to Collector Streets 1, 2 and 3 • Avoid impacts to a build-heritage resource • Lower costs since it potentially avoids direct impacts to the existing residential building / structures on the non-participating landowner property

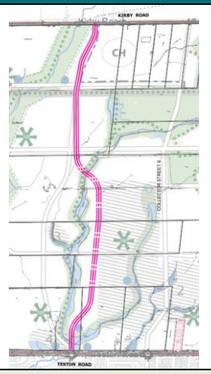
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 5)

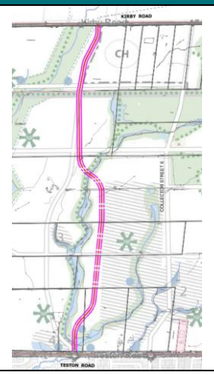
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

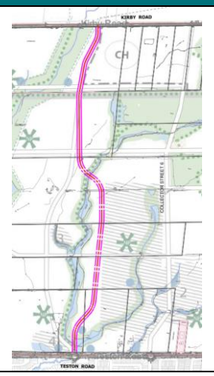
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route	●	• Alternative accommodates future transit infrastructure	●	• Alternative accommodates future transit infrastructure	
	Sub-Category Assessment	●		●		**Alternatives 5A and 5B** are preferred equally from a transit serviceability perspective because both alternatives can accommodate future transit infrastructure within the right-of-way, and the alignment supports adjacent land-uses that are conducive for higher transit ridership
Supports Active Transportation	Encourages active transportation	◕	• Provides safe facility for pedestrian and cyclists • Provides more evenly spaced road network (i.e., distances) between collector roads • Increases in slope heading northbound; not comfortable for all users due to slope change	◑	• Provides safe facility for pedestrian and cyclists • 2 collector roads would be located east of DF-3 with no collector road servicing the land-uses between the greenbelt and west of DF-3 (AT users could use both Streets 5 and 6 to get the same destination south of Street 2) • Increases in slope heading northbound; not comfortable for all users due to slope change	
	Considers pedestrian/cyclist safety	◑	• Provides safe facilities for both pedestrians and cyclists	◑	• Provides safe facilities for both pedestrians and cyclists	
	Sub-Category Assessment	◕		◑		**Alternatives 5A** is preferred from an active transportation perspective because it provides more evenly spaced road network (i.e., distances) between collector roads and provides a road network for AT users to access the land-uses between the Greenbelt and DF-3 south of Street 2
Road Capacity	Provides sufficient road capacity for the projected traffic needs	●	• Roadway has sufficient capacity for projected traffic needs	●	• Roadway has sufficient capacity for projected traffic needs	

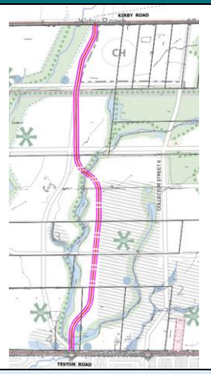
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred equally from a road capacity perspective because both alternatives will provide the same road capacity and will meet protected traffic needs for Block 27
Design Standard Compliance	Compliance with City and Regional design standards		• Complies with City and Regional design standards		• Complies with City and Regional design standards	
	Meets accessibility standards (AODA)		• Complies with City and Regional design standards		• Complies with City and Regional design standards	• Maximum slope of the road is 2.5% or less. There is no significant difference between options, therefore there is no preferred option.
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)		• Provides flexibility to accommodate future designs • Connects with Kirby Road at the recommended location in the NVNCTMP • Provides direct connection to Cranston Park (Community south of Block 27)		• Provides some flexibility to accommodate future designs • Connects with Kirby Road at the recommended location in the NVNCTMP • Provides direct connection to Cranston Park (Community south of Block 27)	
	GHG Emissions		• Difference in GHG between road alignments is negligible		• Difference in GHG between road alignments is negligible	
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred equally from a design standard compliance perspective because they both meet all design standards and have the ability to accommodate future designs and emerging technologies
Community Connectivity	Provides enhanced connections to major destinations for all modes		• Alignment 5A has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it passes through the Natural Heritage Area, intersects with trails, and abuts the future school and park. • It allows for an efficient and well-designed road pattern that establishes good building footprints that adheres to urban design principles • Provides better spacing between north-south collector roads • Provides direct connection to Cranston Park (Community south of Block 27)		Alignment 5B has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it passes through the Natural Heritage Area, intersects with trails, and abuts the future school and park. • It does not allow for an efficient and well-designed road pattern that establishes good building footprints that adheres to urban design principles • Provides poor spacing between collector roads because Alternative 5B would result in having two collector roads east of DF-3 • Provides direct connection to Cranston Park (Community south of Block 27)	

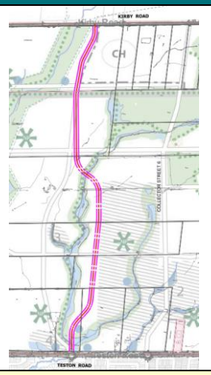
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Contributes to flexibility of the network to allow for better access/service		• Provides an alternative north-south route across the study area		• Provides an alternative north-south route across the study area	
	Aligns with fine-grained network of streets (local, collector, and arterial)		• Intersects with all east-west roads in Block 27		• Intersects with all east-west roads in Block 27	
	Sub-Category Assessment		• Alternative 5A provides good community connectivity		• Alternative 5B provides less community connectivity	**Alternative 5A** is preferred for the following reasons: • Provides direct connections to two schools and a neighbourhood park • Provides good community connectivity
Overall Category Ranking						**Alternative 5A** is slightly preferred from an overall Transportation perspective for the following reasons: • Provides direct connections to two schools and a neighbourhood park • Provides better community connectivity
Natural Environment						
Fish/Fish Habitat	Potential Impacts to fish or fish habitat		• Alternative 5A would result in negative effects on fish habitat through associated proposed realignment of a 200 m long reach of the lower Drainage Feature DF3		• Alternative 5B would result in negative effects on fish and fish habitat as it would require a realignment of portions of the lower Drainage Feature DF3. • Alternative 5B can also have potential negative effects on the drainage feature DF3 through modification of flow conveyance and sediment transport due to an additional crossing of DF3 further upstream	• Both alternatives have similar impacts on downstream portions
	Level of opportunity to mitigate / minimize impact to fish and fish habitat		• Watercourse realignment of lower portions of DF3 along with associated wetland restoration within floodplain would mitigate impact to fish habitat and eventually provide net ecological benefits due to current conditions of DF3 lower portions (straight channel with almost no riparian vegetation) • Location of alternative to the west better supports the proposed realignment of DF3 on the east side		• Watercourse realignment of lower portions of DF3 along with wetland restoration within floodplain would mitigate impact to fish habitat and eventually provide net ecological benefits due to current conditions of DF lower portions (straight channel with almost no riparian vegetation). • Appropriate open-bottom culvert with unwetted natural banks on both side of watercourse, at the proposed crossing of DF3 upstream portion	
	Sub-Category Assessment					**Alternative 5A** is preferred from a fish and fish habitat perspective for the following reasons: • Has the least environmental effects

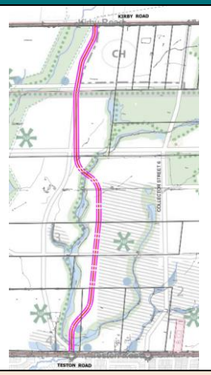
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
			• Alternative 5B would result in an additional watercourse crossing upstream of DF3			
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation	○	• Wetland vegetation affected as part of PSW removal • Removal of portions of treed hedgerows	○	• Wetland vegetation effected as part of PSW removal • Removal of portions of treed hedgerows	
	Impacts to wildlife and wildlife habitat	○	Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows • Habitat for amphibians (Spring Peeper, Wood Frog, American Toad), small mammals and common wetland bird species (Red-winged Blackbird, Yellow Warbler) provided by 0.18 ha of meadow marsh and thicket swamp proposed for removal	○	Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows • Habitat for amphibians (Spring Peeper, Wood Frog, American Toad), small mammals and common wetland bird species (Red-winged Blackbird, Yellow Warbler) provided by 0.16 ha of meadow marsh and thicket swamp proposed for removal	
	Impacts to wildlife due to environmental fragmentation	◔	• North south oriented roads (parallel with the main natural corridor) generate lesser disturbance on wildlife movement	○	• North south oriented roads (parallel with the main natural corridor) generate lesser disturbance on wildlife movement, however, potential disturbance might result from Alternative 5B at second crossing in central portion of drainage feature DF3	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife along Drainage Feature DF3 (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals)	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife along Drainage Feature DF3 (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals)	
	Sub-Category Assessment		◑		◔	**Alternative 5A** is preferred from a vegetation, wildlife, and wildlife habitat perspective for the following reasons: • Has less environmental effects • Alternative 5B would result in an additional crossing of DF3
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to Provincially Significant Wetlands (PSW)	○	• Removal of approximately 0.18 ha of PSW and 0.55 ha of associated 30 m buffer	○	• Removal of approximately 0.16 ha of PSW and 0.27 ha of associated 30 m buffer	
	Impacts to Significant Woodland	◑	• No Significant Woodland is lost	◑	• No Significant Woodland is lost	
	Impacts to Significant Wildlife Habitat (SWH)	◑	• No SWH lost	◑	• No SWH lost	

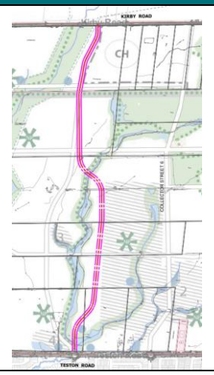
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas	●	• Wetland restoration associated with DF3 lower portion realignment would compensate the loss of wetland	●	• Wetland restoration associated with DF3 lower portion realignment would compensate the loss of wetland	
	Sub-Category Assessment		◑		◑	**Alternatives 5A and 5B** are preferred equally from a designated natural heritage features and environmentally sensitive areas perspective for the following reasons: • Relatively similar impacts to PSW which would be compensated as part of realignment of DF 3 lower portion
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◔	• Has the potential to directly impact rare or uncommon plant species associated with partial removal of Wetland #6	◔	• Has the potential to directly impact rare or uncommon plant species associated with partial removal of Wetland #6	
	Impacts to Species of Conservation Concern and their habitat	◑	• No impacts to Species of Concern resulting from Alternative 5A	◑	• No impacts to Species of Concern resulting from Alternative 5B	
	Impacts to Species at Risk Endangered or Threatened Species and their habitat	○	• Direct Impact on Bobolink and Eastern Meadowlark habitat of approximately 1.6 ha • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	○	• Direct Impact on Bobolink and Eastern Meadowlark habitat of approximately 1.6 ha • Implications of all options on SAR species would be addressed through MECP approval/permitting requirements	
	Sub-Category Assessment		◑		◑	**Alternatives 5A and 5B** are preferred equally from a rare species, species of conservation concern, and endangered or threatened species perspective because impacts are similar
	Overall Category Ranking		◑		◔	**Alternative 5A** is preferred from an overall Natural Environment perspective for the following reasons: • Generally, has less environmental effects • Requires one less crossing of Drainage Feature DF3
Hydrogeology / Drainage						
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources	◑	• A portion of Alternative 5A is located in an area mapped as having highly vulnerable aquifers; however, no significant impact to groundwater quality anticipated with BMPs in place for road salt management	◑	• A portion of Alternative 5B is located in an area mapped as having highly vulnerable aquifers; however, no significant impact to groundwater quality anticipated with BMPs in place for road salt management	

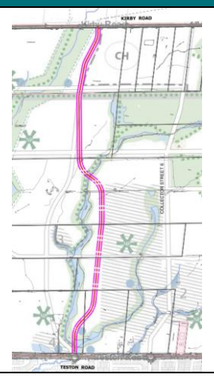
Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Potential to affect the quantity of groundwater resources	◑	• No significant impact to recharge anticipated from road construction	◑	• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources	◑	• No anticipated impact to groundwater movement	◑	• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area	◑	• Alternative 5A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	◑	• Alternative 5B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water	◑	• Area will be municipally serviced for drinking water	◑	• Area will be municipally serviced for drinking water	
	Sub-Category Assessment		◑		◑	**Alternatives 5A and 5B** are preferred equally from a hydrogeology / ground water perspective because no significant impacts are anticipated for any of the alternatives with appropriate BMPs measures in place
Surface Water and Drainage	Potential to affect surface water quality and quantity	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity •	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity •	
	Provides sufficient drainage and treatment	◑	• The run-off will be drained via storm sewer system and CBs and treated in SWM facilities	◑	• The run-off will be drained via storm sewer system and CBs and treated in SWM facilities	
	Sub-Category Assessment		◑		◑	**Alternatives 5A and 5B** are preferred equally from a surface water and drainage perspective because the road lengths for both alternatives are similar, as such, similar impact on surface water quality and quantity are anticipated
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))	●	• Avoids requiring a floodplain crossing in the ultimate configuration due to the realigned creek. • Channel realignment is required, and new channel should compensate for the volume loss	○	• Floodplain crossing is required at 2 locations; one of the crossings is located at the confluence of 2 watercourses	• Alternative 5A is preferred as it avoids floodplain crossings.
	Level of opportunity to mitigate / minimize impacts to floodplains	●	• No impact on floodplain.	◔	• By appropriate sizing (within reasonable range) of crossing the impact can be minimized, however crossing structure will be complicated due to the location at confluence of 2 watercourses.	• Alternative 5A is preferred as it avoids floodplain crossings.

Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Sub-Category Assessment					**Alternative 5A** is preferred from a floodplain perspective as it avoids the requirement for an additional floodplain crossing and associated impacts with the crossing
Overall Category Ranking						**Alternative 5A** is preferred from an overall Hydrogeology / Drainage perspective for the following reasons: • It avoids the requirement for an additional floodplain crossing and associated impacts with the crossing
Socio-Economic Environment						
Land-use Policy Compliance	Conformity with Provincial, Regional, and municipal land-use policy objectives		• Conforms with Provincial, Regional and municipal land-use policy objectives, however, does not confirm with environmental policies to avoid impacts to PSWs • Allows for an efficient and well-designed road pattern that establishes good building footprints and adheres with provincial land-use policies which encourages maximizing development potential		• Conforms with Provincial, Regional and municipal land-use policy objectives, however, does not confirm with environmental policies to avoid impacts to PSWs • It does not allow for an efficient and well-designed road pattern that establishes good building footprints, as such, the alternative does not conform with provincial land-use policies which encourages maximizing development potential	
	Sub-Category Assessment					**Alternative 5A** is preferred from a policy compliance perspective because it allows for an efficient and well-designed road pattern that establishes good building footprints and adheres with provincial land-use policies which encourages maximizing development potential
Non-Participating Property Impacts	Number of impacted non-participating properties that would need to be acquired		• Impacts to non-participating properties are not required		• Impacts to non-participating properties are not required	
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred equally from a non-participating property impacts perspective because both alternatives do not require impacts to non-participating properties
Future Land Uses	Level of service to proposed land uses		• Sufficient LOS is provided to proposed land uses		• Sufficient LOS is provided to proposed land uses	

Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred equally from a future land use perspective because both alternatives provide sufficient level of service (LOS) to proposed land uses
Noise and Air Quality Impacts	Impacts on noise and vibration sensitive receptors		• There are no non-participating properties areas / noise sensitive areas within the vicinity of Alternative 5A		• There are no non-participating properties areas / noise sensitive areas within the vicinity of Alternative 5B	
	Impacts on air quality		• The majority of the study area consists of agricultural land with no existing receptors; future conditions will include new residential uses (receptors) and will involve declining trends in tailpipe emissions as older cars are replaced by newer cars		• The majority of the study area consists of agricultural land with no existing receptors; future conditions will include new residential uses (receptors) and will involve declining trends in tailpipe emissions as older cars are replaced by newer cars	
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred equally from a noise and air quality impact perspective, for the following reasons: • There are no non-participating properties areas / noise sensitive areas within the vicinity the alternatives, as such, there are no anticipated noise impacts to NSAs
Overall Category Ranking						**Alternative 5A** is preferred from an overall Socio-Economic Environment perspective for the following reasons: • Allows for an efficient and well-designed road pattern that establishes good building footprints and adheres with provincial land-use policies which encourages maximizing development potential
Cultural Environment						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost through displacement • Disruption to the cultural heritage landscape context of Cultural Heritage CHL 1, 2 and 4. CHL 1 is municipally Listed. CHL 2 and 3 have potential heritage value		• No built heritage resources (BHR) lost through displacement • Disruption to the cultural heritage landscape context of Cultural Heritage CHL 1, 2 and 4. CHL 1 is municipally Listed. CHL 2 and 3 have potential heritage value	• Both Alternatives has similar effects which are low in terms of contextual change. Running through mid-lot in open agricultural lands reduces impacts. • Opportunities to supports commemoration of Indigenous and Euro-Canadian settlement in Vaughan Township

Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Sub-Category Assessment		• Alternative 5A impacts three (3) identified cultural heritage landscapes, including one (1) that is municipally Listed • No built heritage resources are displaced		• Alternative 5B impacts three (3) identified cultural heritage landscapes, including one (1) that is municipally Listed • No built heritage resources are displaced	**Alternatives 5A and 5B** are preferred equally from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • Both alternatives have the same impacts on the cultural heritage environment and similar impacts on the contextual values in the CHLs • No built heritage resources are displaced • There are opportunities to support commemorative interpretation
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential		• Stage 2 assessment will be required for Parcel 10 • Indigenous Peoples engagement will be required during fieldwork		• Stage 2 assessment will be required for Parcel 10 • Indigenous Peoples engagement will be required during fieldwork	• Both alignments originate in Parcel 10, neither alignment intersect with areas that require further work outside of parcel 10
	Sub-Category Assessment					**Alternatives 5A and 5B** are preferred from an archaeological resources perspective for the following reasons: • Both alignments originate in Parcel 10 and neither alignment intersect with areas that require future archaeological assessment outside of parcel 10 • No material difference between alignments
Overall Category Ranking						**Alternatives 5A and 5B** are preferred equally from an overall Cultural Environment perspective for the following reasons: • Both alternatives have the same impacts on the cultural heritage environment and similar impacts on the contextual values in the CHLs • Both alternatives will require further Stage 2 archaeological assessment on Parcel 10
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction		• Avoids floodplain and watercourse crossings, therefore more preferred		• Requires two additional water crossings and a complicated water crossing structure	
	Cost effectiveness to build		• Requires realignment of watercourse, however no crossings are required		• Requires minor realignment of water course and two additional water crossings and a complicated water crossing structure	
	Cost of compensation for impacts to the natural environment		• The impact to the natural environments especially close to the Teston road are similar		• The impact to the natural environments especially close to the Teston road are similar	

Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development	◑	• Construction works can be phased	◑	• Construction works can be phased	
	Sub-Category Assessment		◑		◑	**Alternative 5A** is preferred from an engineering feasibility and construction cost perspective for the following reasons: • Avoids the need for floodplain and watercourse crossings • Lower construction cost
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)	◔	• Requires crossing TCE pipeline and requires relocation of existing utilities along Teston Road	◔	• Requires crossing TCE pipeline and requires relocation of existing utilities along Teston Road	
	Impacts on existing municipal infrastructure	◑	• Requires extension of existing culvert	◑	• Requires extension of existing culvert	
	Sub-Category Assessment		◑		◑	**Alternatives 5A and 5B** are preferred equally from an existing municipal infrastructure and utilities perspective because both alternatives will require extension of culvert crossing south on Teston road, relocation of existing utilities and crossing of TCE pipeline and would result in similar impacts
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)	●	• Capital costs are expected to be lower due to no crossings	◑	• Capital costs are expected to be higher due to 2 watercourse crossings	
	Sub-Category Assessment		●		◑	**Alternative 5A** is preferred from a capital cost perspective because capital costs are anticipated to be lower because it avoids the need for watercourse crossings.
Non-Participating Property Acquisition	Scale of non-participating property costs (relative scale-preferred to least preferred)	◑	• Same length of road is proposed on non-participating landowner in both options	◑	• Same length of road is proposed on non-participating landowner in both options	
	Number of impacted properties that would need to be acquired	◑	• One non-participating landowner	◑	• One non-participating landowner	
	Sub-Category Assessment		◑		◑	**Alternative 5A and 5B** are preferred equally from a property acquisition perspective because both alternatives require the same length of road is proposed on non-participating landowner and would result in similar impacts

Evaluation Criteria		Alternative 5A		Alternative 5B		Comments / Rationale
						
Operating and Maintenance Costs	Operating and maintenance costs		• Length of the road are similar, as such, operating costs are estimated to be the same in both the alternatives • Considering no crossings are required, maintenance costs will be lower		• Length of the road are similar, as such, operating costs are estimated to be the same in both the alternatives • Maintenance costs will be higher for this alternative due to 2 culverts crossing requirements	• Due to similar length of the road, operating costs are estimated to be the same in both the alternatives
	Sub-Category Assessment					• **Alternative 5A** is preferred from an operating and maintenance costs perspective because it avoids the need for watercourse crossings, therefore lower operation and maintenance costs are anticipated to be required
Overall Category Ranking						**Alternative 5A** is preferred from an overall Cost & Constructability perspective because it avoids the need for floodplain and watercourse crossings, as such, lower construction, operation, and maintenance costs are anticipated to be required
OVERALL EVALUATION						**Alternative 5A was selected as the preferred Street 5 alternative for the following reasons:** • Provides direct connections to two schools and a neighbourhood park • Provides better community connectivity • Generally, has less environmental effects • Avoids the requirement for an additional floodplain crossing and associated impacts with the crossing • Allows for an efficient and well-designed road pattern that establishes good building footprints and adheres with provincial land-use policies which encourages maximizing development potential • Lower construction, operation, and maintenance cost

Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 6)

Legend:

○ ◔ ◑ ◕ ●

Least Benefits / Most Impacts → Most Benefits / Least Impacts

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route	◕	• Future transit may be accommodate / supported given recommended distance are provided between signalized intersections • Will not connect to Kirby GO Station	◑	• There may be challenges with accommodating future transit due to intersection spacing • Will not connect to Kirby GO Station	
	Sub-Category Assessment		◕		◑	**Alternative 6A** is preferred from a transit serviceability perspective because the alignment provides the recommended distance between signalized intersection
Supports Active Transportation	Encourages active transportation	◕	• Provides safe facility for pedestrians and cyclists	◕	• Provides safe facility for pedestrians and cyclists	
	Considers pedestrian/cyclist safety	◑	• No landscape buffer between active transportation facilities and travel lanes through the woodlot to minimize natural environmental impacts (reduced buffer) • Active transportation facilities will be separated (off-street) with a 0.5 m buffer	◑	• No landscape buffer between active transportation facilities and travel lanes through the woodlot to minimize natural environmental impacts (reduced buffer) • Active transportation facilities will be separated (off-street) with a 0.5 m buffer	
	Sub-Category Assessment		◑		◑	**Alternatives 6A and 6B** are preferred equally from an active transportation perspective because both alternatives provide safe facilities for active transportation users, however, enhanced safety features may not be able to be accommodated through the significant woodlot due to the reduced cross-section to minimize natural environmental impacts

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
Road Capacity	Provides sufficient road capacity for the projected traffic needs	◑	• Roadway provides sufficient road capacity for projected traffic needs • Any road widening that may be required in the future to accommodate future traffic needs through the significant woodlot will be complex due to impacts to the significant woodlot and will require relevant agency approvals/permits	◑	• Roadway provides sufficient road capacity for projected traffic needs • Any road widening that may be required in the future to accommodate future traffic needs through the significant woodlot will be complex due to impacts to the significant woodlot and will require relevant agency approvals/permits	
	Sub-Category Assessment		◑		◑	**Alternatives 6A and 6B** are preferred equally from a road capacity perspective because both alternatives provide sufficient road capacity for anticipated future traffic needs with similar constraints through the significant woodlot
Design Standard Compliance	Compliance with City and Regional design standards	●	• Complies with City and Regional design standards	◑	• Complies with City and Regional design standards • Separation distance does not meet recommended 300 m between signalized intersections	
	Meets accessibility standards (AODA)	●	• Meets AODA standards	●	• Meets AODA standards	• Maximum slope of the road is 3.5% or less. There is not significant difference between options, therefore there is no preferred option.
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)	◕	• Connects to St. Joan of Arc Avenue (community south of Block 27) • Can be accommodate with Kirby Road widening (further future coordination will be required) • No known development at Street 6 north of Block 27 (existing conditions is a golf course)	◕	• Connects to St. Joan of Arc Avenue (community south of Block 27) • Can be accommodate with Kirby Road widening (further future coordination will be required) • No known development at Street 6 north of Block 27 (existing conditions is a golf course)	
	Greenhouse gas (GHG) emissions	◑	• Difference in GHG between alternatives is negligible	◑	• Difference in GHG between alternatives is negligible	
	Sub-Category Assessment		◕		◑	**Alternative 6A** is preferred from a design standard compliance perspective because it complies with City and Regional design standards where as Alternative 6B does not meet the recommended distance between signalized intersections
Community Connectivity	Provides enhanced connections to major destinations for all modes	◑	• Provides some connections to major destinations for all modes • Has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it passes	◕	• Provides direct connections to community hub • Has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it passes through the Natural Heritage Area,	

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
			through the Natural Heritage Area, intersects with trails, and abuts the future school and park		intersects with trails, and abuts the future school and park	
	Contributes to flexibility of the network to allow for better access/service		• Provides another north-south road across the study area • Provides a direct connection with the adjacent neighbourhood to the south (St. Joan of Arc Ave)		• Provides another north-south road across the study area • Provides a direct connection with the adjacent neighbourhood to the south (St. Joan of Arc Ave)	
	Aligns with fine-grained network of streets (local, collector, and arterial)		• Intersects with east-west streets within Block 27		• Intersects with east-west streets within Block 27	
	Sub-Category Assessment					**Alternatives 6A and 6B** are preferred equally from a community connectivity perspective because both alternatives provide end-to-end connectivity across Block 27 and connects with the existing neighbourhood to the south
Overall Category Ranking						**Alternative 6A** is the preferred routes from a Transportation perspective for the following reasons: • Provides the recommended distance between signalized intersection which better accommodates transit and meet design standards
Natural Environment						
Fish/Fish Habitat	Potential Impacts to fish or fish habitat		• Fish habitat lost		• Fish habitat lost	
	Level of opportunity to mitigate / minimize impact to fish and fish habitat		• N/A		• N/A	
	Sub-Category Assessment					**Alternatives 6A and 6B** are preferred equally from a fish and fish habitat perspective because both alternatives have impact to fish habitat along DF-32

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation	○	• Removal of 0.88 ha of deciduous forest communities (FOD3-1, FOD5-1 and FOD6-5) and 0.17 ha of cultural woodland (CUW1) • Impacts to portions of treed hedgerows. • Road fragmentation of woodland will result in significant edge effects which will favour edge-tolerant species that are often exotic species outcompeting native species	○	• Removal of 1.07 ha of deciduous forest communities (FOD3-1, FOD5-1 and FOD6-5) will be removed • Impacts to portions of treed hedgerows • Road fragmentation of woodland will result in significant edge effects which will favour edge-tolerant species that are often exotic species outcompeting native species	**Alternative 6A** is slightly preferred over Alternative 6B from an impact to vegetation perspective because it results in fewer tree removals
	Impacts to wildlife and wildlife habitat	◔	• Results in the removal of portions of habitat for: ○ Area-sensitive woodland bird species including White-breasted Nuthatch, Hairy Woodpecker, Pine Warbler, and American Redstart ○ One bird species listed as Special Concern under the provincial ESA (2007): Eastern Wood-Pewee ○ Will result in the removal of 64 snag trees (trees with bat maternity roost attributes)	○	• Result in the removal of portions of habitat for: ○ Area-sensitive woodland bird species including White-breasted Nuthatch, Hairy Woodpecker, Pine Warbler and American Redstart ○ One bird species listed as Special Concern under the provincial ESA (2007): Eastern Wood-Pewee ○ Will result in the removal of 90 snag trees (trees with bat maternity roost attributes)	
	Impacts to wildlife due to environmental fragmentation	○	• Will result in a fragmentation of forest habitat throughout the northern woodland • Resulting edge effect will further reduce forest interior habitat	○	• Will result in a fragmentation of forest habitat throughout the northern woodland • Resulting edge effect will further reduce forest interior habitat	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	◕	• Ecosystem restoration to recreate suitable habitat for wildlife, however, reforestation on other areas of Block 27 could not entirely mitigate this level of habitat fragmentation and associated disturbance	◕	• Ecosystem restoration to recreate suitable habitat for wildlife, however, reforestation on other areas of Block 27 could not entirely mitigate this level of habitat fragmentation and associated disturbance	
	Sub-Category Assessment		◑		◔	**Alternative 6A** is preferred slightly from a vegetation, wildlife, and wildlife habitat perspective because the alternative impacts a smaller number of trees with potential for bat roosting habitat
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to ANSIs	◑	• No identified ANSIs in the study area	◑	• No identified ANSIs in the study area	
	Impacts to Wetlands, including Provincially Significant Wetlands	◑	• No PSW unit lost or affected • Similar impacts to Wetlands A and B	◑	• No PSW unit lost or affected • Similar impacts to Wetlands A and B	
	Impacts to Significant Woodland	◔	• Removal of approximately 1.05 ha of Significant Woodland including:	○	• Removal of approximately 1.07 ha of Significant Woodland including:	

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
			• 0.88 ha of Deciduous Forest (FOD communities); and • 0.17 ha of Cultural Woodland (CUW1) • 0.1 ha of associated 10 m buffer		• 1.07 ha of Deciduous Forest (FOD communities) • 0.09 ha of associated 10 m buffer	
	Impacts to Significant Wildlife Habitat		• 1.05 ha of the northern woodland would be removed, and fragmentation and edge effects would result. • The woodland is not considered maternity roosting habitat for endangered species of bats based on acoustic monitoring findings, however, this woodland has potential to be considered candidate Bat Maternity Colony SWH. Specific surveys following MNRF guidance would be required to confirm		• 1.07 ha of the northern woodland would be removed, and fragmentation and edge effects would result. • The woodland is not considered maternity roosting habitat for endangered species of bats based on acoustic monitoring findings, however, this woodland has potential to be considered candidate Bat Maternity Colony SWH. Specific surveys following MNRF guidance would be required to confirm	
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas		• Reforestation would compensate for the loss of woodland over time. However, reforestation on other areas of Block 27 could not entirely mitigate this level of habitat fragmentation and associated disturbance		• Reforestation would compensate for the loss of woodland over time. However, reforestation on other areas of Block 27 could not entirely mitigate this level of habitat fragmentation and associated disturbance	
	Sub-Category Assessment					**Alternative 6A** is slightly preferred from a designated natural heritage features and environmentally sensitive areas perspective because although both alternatives will have major impacts to significant woodland, Alternative 6A requires less deciduous forest removal
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat		• No rare species have been recorded within footprint		• Has the potential to directly impact a Black Maple, a rare plant species • Plant salvage could help mitigate impacts in rare plant species	
	Impacts to Species of Conservation Concern and their habitat		• No species of conservation concern (ranked as S1 through S3 by the province) were present during any of the seasonal investigations		• No species of Conservation Concern (ranked as S1 through S3 by the province) were present during any of the seasonal investigations	
	Impacts to Species at Risk (Endangered or Threatened) and their habitat		• No endangered or threatened species been recorded within the alignment footprint		• No endangered or threatened species been recorded within the alignment footprint	Additional targeted search for Butternut trees will be required at later stages in portions of woodland and treed hedgerow proposed for removal.
	Sub-Category Assessment					**Alternative 6A** is preferred from a rare species, species of conservation concern, and endangered or

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						threatened species perspective because it avoids impacts to rare plant species
	Overall Category Ranking					**Alternative 6A** is preferred from an overall natural environment perspective for the following reasons: • Results in fewer tree removals • Impacts a smaller number of trees with potential for bat roosting habitat • Requires less deciduous forest removal
Hydrogeology and Drainage						
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources		• Not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management		• Not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area		• Alternative 6A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 6B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water	
	Sub-Category Assessment					**Alternatives 6A and 6B** are preferred equally from a hydrogeology / ground water perspective because significant impacts are not anticipated for any of the alternatives and there is no preferred option.
Surface Water and Drainage	Potential to affect surface water quality and quantity		• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity		• Similar length of road between both the alternatives, therefore similar impact on surface water quality and quantity	

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
	Provides sufficient drainage	◑	• The run-off will be drained via storm sewer system and CBs and treated in SWM facilities	◑	• The run-off will be drained via storm sewer system and CBs and treated in SWM facilities	
	Sub-Category Assessment	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water and drainage	◑	• Similar length of road between both the alternatives, therefore similar impact on surface water and drainage	**Alternatives 6A and 6B** are preferred equally from a surface water and drainage perspective because both alternatives have a similar in length of road, therefore similar impacts to surface water and drainage are anticipated.
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))	◑	• Similar floodplain encroachment in both the alternatives	◑	• Similar floodplain encroachment in both the alternatives	**Alternatives 6A and 6B** are preferred equally from a flood plain perspective because similar floodplain encroachment is required. With appropriate sizing of the culvert the impact of the encroachments on the floodplain can be reduced.
	Sub-Category Assessment		◑		◑	**Alternatives 6A and 6B** are preferred equally from a floodplain perspective because both alternatives are similar in road length and have same encroachment impacts, however, with appropriate sizing of the culvert the impact of the encroachments on the floodplain can be mitigated.
Overall Category Ranking			◑		◑	**Alternatives 6A and 6B** are preferred equally from an overall Hydrogeology and Drainage perspective for the following reasons: • Both alternatives are similar in road length resulting in similar impact on surface water and drainage • Similar floodplain encroachment is required • With appropriate sizing of the culvert the impact of the encroachments on the floodplain can be reduced
Socio-Economic Environment						
Land-Use Policy Compliance	Conformity with Provincial, Regional, and municipal policy objectives	◔	• Conforms with Provincial, Regional, and municipal policy objectives, however, does not comply with environmental policies to avoid impacts to significant woodlands	◔	• Conforms with Provincial, Regional, and municipal policy objectives, however, does not comply with environmental policies to avoid impacts to significant woodlands	
	Sub-Category Assessment		◔		◔	**Alternatives 6A and 6B** are preferred equally from a policy compliance perspective because both

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						alternatives conform with Provincial, Regional, and municipal policy objectives but do not comply with environmental policies to avoid impacts to significant woodlands
Future Land Uses	Level of service to proposed land uses	●	• Sufficient LOS is provided to all proposed land uses • Road alignment brings road users closer to future KirbyGO station • Provides a better land-use transition between the mid-rise mix-use and mid-rise residential zones	◔	• Sufficient LOS is provided to all proposed land uses • Road alignment is further away from the future KirbyGO station • Would result in spacing which does not accommodate a good land-use transition between the mid-rise mix-use and mid-rise residential zones	
	Sub-Category Assessment		●		◔	**Alternative 6A** is preferred from a future land use perspective because it brings road users closer to the Kirby GO station, and provides a better land-use transition between the mid-rise mix-use and mid-rise residential zones
Impacts of Non-Participating Property Owners	Number of impacted non-participating properties that would need to be acquired	●	Both alternatives are proposed in participating landowner lands.	●	Both alternatives are proposed in participating landowner lands.	
	Sub-Category Assessment		●		●	**Alternatives 6A and 6B** are preferred equally from an impacted non-participating properties perspective because both alternatives do not impact non-participating property owner property
Noise and Air Quality Impact	Impacts on noise and vibration sensitive receptors	◔	• Comes in close proximity to a non-participating land-owner which is a sensitive receptor (Cam Lo Vuong Buddhist Community Temple)	◔	• Comes in close proximity to a non-participating land-owner which is a noise sensitive receptor (Cam Lo Vuong Buddhist Community Temple)	
	Impacts on air quality	◔	• Comes in close proximity to a non-participating land-owner which is an air quality sensitive receptor (Cam Lo Vuong Buddhist Community Temple)	◔	• Comes in close proximity to a non-participating land-owner which is an air quality sensitive receptor (Cam Lo Vuong Buddhist Community Temple)	
	Sub-Category Assessment		◔		◔	**Alternatives 6A and 6B** are preferred equally from a noise and air quality impact perspective because both alternatives come in close proximity to a non-participating land-owner which is a noise / air quality sensitive receptor (Cam Lo Vuong Buddhist Community Temple)

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
Overall Category Ranking						**Alternative 6A** is preferred from an overall socio-Economic Environment perspective for the following reasons: • Provides a better level of service to proposed land-uses because alignment brings road users closer to the Kirby GO station • Provides a better land-use transition between the mid-rise mix-use and mid-rise residential zones
Cultural Environment						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No BHRs lost • Low impacts to cultural heritage landscape context, however, CHLs will be removed as part of the development		• No BHRs lost • Low impacts to cultural heritage landscape context, however, CHLs will be removed as part of the development	
	Opportunities to frame and celebrate heritage resources		• Can support a commemorative heritage interpretation program.		• Can support a commemorative heritage interpretation program.	• Supports commemoration of Indigenous and Euro-Canadian settlement in Vaughan Township.
	Sub-Category Assessment					**Alternatives 6A and 6B** are preferred equally from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • No built heritage resources are lost for either alternative • Low impacts to cultural heritage landscape context, however, CHLs will be removed as part of the development • Can support a commemorative heritage program
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential		• Parcels 15 & 16 will require Stage 2 assessments. • Stage 2 construction monitoring will be required on parcels 15, 16, and 18 during construction as the alignment is within the Ossuary Model		• Stage 2 assessment is required Parcel 16 which will involve less fieldwork • Avoids construction monitoring requirements • Engagement will be required for fieldwork	• Costs to complete Stage 2 ossuary monitoring is not anticipated to be significant
	Sub-Category Assessment					**Alternative 6B** is preferred from an archeological resource perspective for the following reasons: • Significantly less archaeological and engagement effort since only one parcel will require Stage 2 survey • Avoids impacts within the Ossuary Model

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
Overall Category Ranking						**Alternative 6B** is preferred from am overall cultural heritage environment perspective for the following reasons: • Significantly less archaeological and engagement effort since only one parcel will require Stage 2 survey • Avoids impacts within the Ossuary Model
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction		• Similar road length		• Similar road length	
	Cost effectiveness to build		• Similar road length, therefore there is no preferred option		• Similar road length, therefore there is no preferred alternative	
	Cost of compensation for impacts to the natural environment		• Similar compensation is expected in both the alternatives		• Similar compensation is expected in both the alternatives	
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development		• Construction works can be phased		• Construction works can be phased	
	Sub-Category Assessment					**Alternatives 6A and 6B** are preferred equally from an engineering feasibility and construction cost perspective because although both alternatives have similar road lengths with similar feasibility and construction
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)		• Requires a TCE pipeline crossing • Requires relocation of existing utilities along Teston Road		• Requires a TCE pipeline crossing • Requires relocation of existing utilities along Teston Road	
	Impacts on existing municipal infrastructure		• Requires relocation of catch basins along Teston Road		• Requires relocation of catch basins along Teston Road	
	Sub-Category Assessment					• **Alternatives 6A and 6B** are preferred equally from a from an existing municipal infrastructure and utilities perspective because both alternatives require a TCE pipeline crossing and relocation of existing utilities along Teston Road

Evaluation Criteria		Alternative 6A		Alternative 6B		Comments / Rationale
						
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)	◑	• Capital costs are expected to be similar given road length and crossings are similar	◑	• Capital costs are expected to be similar given road length and crossings are similar	
	Sub-Category Assessment	◑		◑		• **Alternatives 6A and 6B** are preferred equally from a capital cost perspective because costs for road and crossing construction are expected to be similar for both the alternatives
Non-Participating Property Costs	Scale of non-participating property costs (relative scale-preferred to least preferred)	●	• Both alternatives are proposed in participating landowner lands.	●	• Both alternatives are proposed in participating landowner lands.	
	Sub-Category Assessment	●		●		• **Alternatives 6A and 6B** are preferred equally from a from a non-participating property acquisition perspective because impacts to non-participating landowners is not required
Operating and Maintenance Costs	Operating and maintenance costs	◑	• Operating and maintenance costs are expected to be the same in both the alternatives due to similar lengths.	◑	• Operating and maintenance costs are expected to be the same in both the alternatives due to similar lengths.	
	Sub-Category Assessment	◑		◑		• **Alternatives 6A and 6B** are preferred equally from a from an operating and maintenance costs perspective because costs are expected to be similar for both the alternatives
Overall Category Ranking		◑		◑		**Alternatives 6A and 6B are** preferred equally from an overall cost & constructability perspective for the following reasons: • Both alternatives have similar road length with similar feasibility and construction costs • Both alternatives require a TCE pipeline crossing and relocation of existing utilities along Teston Road • Operating and maintenance costs are expected to be the same due to similar road lengths
OVERALL EVALUATION		◔		◑		**Alternative 6A was selected as the preferred Street 6 alternative for the following reasons:** • Provides the recommended distance between signalized intersection • Brings road users closer to the Kirby GO station

Evaluation Criteria	Alternative 6A		Alternative 6B		Comments / Rationale
					• Results in fewer tree removals • Impacts a smaller number of trees with potential for bat roosting habitat • Requires less deciduous forest removal • Provides a better level of service to proposed land-uses • Provides a better land-use transition between the mid-rise mix-use and mid-rise residential zones

Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 7)

Legend:

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
Transportation						
Transit Serviceability	Supports an effective future transit route	●	• Alignment accommodates future transit infrastructure	●	• Alignment accommodates future transit infrastructure	
	Sub-Category Assessment	●		●		**Alternatives 7A and 7B** are preferred equally from a transit serviceability perspective because both alternatives have the ability to accommodate future transit infrastructure
Supports Active Transportation	Considers pedestrian/cyclist safety	◕	• Provides safe facility for pedestrians and cyclists	◕	• Provides safe facility for pedestrians and cyclists	
	Encourages active transportation	●	• Alternative supports active transportation	●	• Alternative supports active transportation	
	Sub-Category Assessment	◕		◕		**Alternatives 7A and 7B** are preferred equally from an active transportation perspective because both alternatives support the provision of safe active transportation facilities for pedestrians and cyclist, and both may have challenges to some users due to slopes
Road Capacity	Provides sufficient road capacity for the projected traffic needs	●	• Roadway provides sufficient road capacity for the projected traffic needs	●	• Roadway provides sufficient road capacity for the projected traffic needs	
	Sub-Category Assessment	●		●		**Alternatives 7A and 7B** are preferred equally from a road capacity perspective because both alternatives provide sufficient road capacity for the projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards	●	• Complies with City and Regional design standards	●	• Complies with City and Regional design standards	

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
	Meets accessibility standards (AODA)	●	• Meets AODA accessibility standards	●	• Meets AODA accessibility standards	• Maximum slope of the road is 2.0% or less. There is not significant difference between options, therefore there is no preferred option
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)	◕	• Street 7 connection to Teston Road is at the location recommended within the NVNCTMP • No preliminary concerns with the location where Street 7 connects with Teston Road with accommodating designs associated with York Region's Teston Road IEA • There are no other known on-going studies within the vicinity of Street 7	◕	• Street 7 connection to Teston Road is at the location recommended within the NVNCTMP • No preliminary concerns with the location where Street 7 connects with Teston Road with accommodating designs associated with York Region's Teston Road IEA • There are no other known on-going studies within the vicinity of Street 7	
	Greenhouse Gas (GHG) Emissions	◑	• Difference in GHG emission between alternatives is negligible	◑	• Difference in GHG emission between alternatives is negligible	
	Sub-Category Assessment	◕		◕		**Alternatives 7A and 7B** are preferred equally from a design standard compliance perspective because both alternatives meet all design standards and have the ability to accommodate future designs and emerging technologies
Community Connectivity	Provides enhanced connections to major destinations for all modes	◕	• Provides adequate connections to major destinations for all modes • Has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it intersects with trails, and abuts the future schools and parks. • Supports Alternative 3A which would result in one additional intersection along Collector Street 6 due to its T-intersection at Alternative 7A, thereby increasing community connectivity • Allows for an efficient grid-like road pattern, which adheres to urban design principles	◑	• Provides adequate connections to major destinations for all modes • Has sufficient space to include streetscape elements that encourage aesthetics and urban design principles, especially in locations where it intersects with trails, and abuts the future schools and parks. • Supports Alternative 3B which would result in one less connection point along Collector Street 6 due to its direct connection with Alternative 3B (one continuous road) • Create as swooping curve that does not allow for an efficient grid-like pattern, which is a better design response, however, the radius was increased to allow for intersection to be accommodated along the curve to improve connections	

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
	Contributes to flexibility of the network to allow for better access/service		• Provides another north-south route for a portion of the study area		• Provides another north-south route for a portion of the study area	
	Aligns with fine-grained network of streets (local, collector, and arterial)		• Intersects with some of the local street network		• Intersects with some of the local street network	
	Sub-Category Assessment					**Alternative 7A** is preferred from a community connectivity perspective because it supports the provision of an additional intersection along Collector Street 6.
Overall Category Ranking						**Alternatives 7A and 7B** were equally preferred from an overall Transportation perspective for the following reasons: • Both alternatives can accommodate transit infrastructure and support and encourages active transportation • Both alternatives provide sufficient road capacity and complies with city and regional design standards • Alternative 7A would provide additional intersection along Collector Street 6 which increases community connectivity and allows for an efficient grid-like road pattern • Although Alternative 7B creates as swooping curve that does not allow for an efficient grid-like pattern, the radius was increased to allow for intersection to be accommodated along the curve to improve connections
Natural Environment						
Fish and Fish Habitat	Impacts to Fish and Fish Habitat		• There are no fish and fish habitat within the vicinity • Impacts to DF-6 not anticipated		• There are no fish and fish habitat within the vicinity • Impacts to DF-6 not anticipated	
	Sub-Category Assessment					
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation		• Removal of portions of treed hedgerows which are (not mature or high quality)		• Removal of portions of treed hedgerows (not mature or high quality)	

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
	Impacts to wildlife and wildlife habitat	◑	Minor wildlife functions lost: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows	◑	Minor wildlife functions: • Habitat for common mammals and edge/urban tolerant bird species associated with removed portions of hedgerows	
	Impacts to wildlife due to environmental fragmentation	◔	• No major disturbance on wildlife movement is anticipated, however some imparts are expected at the southwest of woodland #20 in where wildlife movement inference between the woodland and the DF4 corridor could result from combination of Alternative 7A and Street 6 (Alternative 6A or Alternative 6B)	◕	• No major disturbance on wildlife movement is anticipated	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	●	• Appropriate culvert design to accommodate wildlife passage (amphibians, reptiles, small mammals)	●	• Appropriate culvert design to accommodate wildlife passage (amphibians, reptiles, small mammals)	
	Sub-Category Assessment		◑		◕	**Alternative 7B** is slightly preferred from a vegetation, wildlife, and wildlife habitat perspective for the following reasons: • It minimizes disturbance to wildlife movement
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to Provincially Significant Wetlands	◑	• No anticipated impacts to PSW	◑	• No anticipated impacts to PSW	
	Impacts to Significant Woodland	◔	• Minor encroachment of 35 m^2 into the woodland buffer	◕	• No anticipated impacts to Significant Woodland	
	Impacts to Significant Wildlife Habitat	◑	• No anticipated impacts to Significant Wildlife Habitat	◑	• No anticipated impacts to Significant Wildlife Habitat	
	Sub-Category Assessment		◔		◕	**Alternative 7B** is preferred from a designated natural heritage features and environmentally sensitive areas perspective because of the following reasons: • It avoids encroachment into the woodland buffer
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◑	• No rare species have been recorded within footprint of Alternative 7A	◑	• No rare species have been recorded within footprint of Alternative 7B	
	Impacts to Species of Conservation Concern and their habitat	◑	• No impacts to Species of Concern anticipated to result from Alternative 7A	◑	• No impacts to Species of Concern anticipated to result from Alternative 7B	
	Impacts to Endangered or Threatened Species and their habitat	◑	• No endangered and threatened species been recorded within footprint of Alternative 7A	◑	• No endangered and threatened species been recorded within footprint of Alternative 7B	
	Sub-Category Assessment		◑		◑	**Alternatives 7A and 7B** are preferred equally from a rare species, species of conservation concern, and

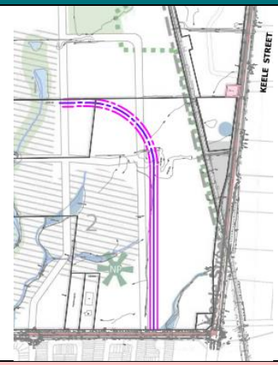
Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
			endangered or threatened Species perspective because there are no anticipated impacts for either alternative			
	Overall Category Ranking					**Alternative 7B** is slightly preferred from an overall Natural Environmental perspective for the following reason: • Minimizes disturbance to wildlife movement • Avoids encroachment into the significant woodland buffer
Hydrogeology and Drainage						
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources		• Alternative 7A is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management		• Alternative 7B is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area		• Alternative 7A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 7B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water	
	Sub-Category Assessment					**Alternatives 7A and 7B** are preferred equally from a hydrogeology / ground water perspective because significant impacts are not anticipated for any of the alternatives
Surface Water and Drainage	Potential to affect surface water quality and quantity		• Longer road length, therefore more impact on surface water quality and quantity, however, given the difference is 235 m, additional impacts are minor (Length = 1276.8m)		• Shorter length of road and therefore less impact on surface water quality and quantity (Length = 1041.8m)	
	Provides sufficient drainage		• The run-off will be drained via storm sewers and catch basins and treated in SWM facilities		• The run-off will be drained via storm sewers and catch basins and treated in SWM facilities	

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
	Sub-Category Assessment					**Alternatives 7A and 7B** are preferred equally from a surface water and drainage perspective because the roads are similar lengths which will result in similar impacts on surface water quality and quantity. The run-off will be drained via storm sewers and catch basins and treated in SWM facilities in both alternatives.
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))		• No floodplain encroachment is proposed in either of the options.		• No floodplain encroachment is proposed in either of the options.	
	Level of opportunity to mitigate / minimize impacts to floodplains		• No floodplain encroachment is proposed in either of the options.		• No floodplain encroachment is proposed in either of the options.	
	Sub-Category Assessment		• No floodplain encroachment is proposed in either of the options.		• No floodplain encroachment is proposed in either of the options.	**Alternatives 7A and 7B** are preferred equally from a floodplain perspective because either alternative avoids encroachment onto floodplain
Overall Category Ranking						**Alternatives 7A and 7B** are equally preferred from an overall Hydrogeology and Drainage perspective for the following reasons: • The shorter length of road results in less impact on surface water quality and quantity of run-off
Socio-Economic Environment						
Policy Compliance	Conformity with Provincial, Regional, and municipal policy objectives		• Conforms with Provincial, Regional, and municipal policy objectives • Although adheres to urban design principles, this alternative creates an inefficient development pattern		• Conforms with Provincial, Regional, and municipal policy objectives • Provides for an efficient development pattern that encourages aesthetic and adheres to urban design principles	
	Sub-Category Assessment					**Alternative 7B** is preferred from a policy compliance perspective because it provides for an efficient development pattern that encourages aesthetic and adheres to urban design principles
Future Land Uses	Level of service to proposed land uses		• Sufficient level of service is provided to proposed land uses		• Sufficient level of service is provided to proposed land uses	
	Sub-Category Assessment					**Alternative 7A and 7B** are preferred equally from a future land use perspective because both alternatives

Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						provide sufficient level of service to proposed land uses
Impacts to Non-Participating Property Owners	Number of impacted non-participating properties	●	• No impacts to non-participating landowner lands	●	• No impacts to non-participating landowner lands	
	Sub-Category Assessment		●		●	**Alternative 7A and 7B** are preferred equally from an impact to non-participating property owner perspective because no impacts to non-participating landowner lands are required
Noise and Air Quality Impacts	Impacts on noise and vibration sensitive receptors	◔	• The road alignment is within close proximity to a noise sensitive area (Cam Lo Vuong Buddhist Community Temple) (~150 m)	◔	• The road alignment is within close proximity to a noise sensitive area (Cam Lo Vuong Buddhist Community Temple) (~150 m)	
	Impacts on air quality	◔	• The road alignment is within close proximity to an air quality sensitive receptor (Cam Lo Vuong Buddhist Community Temple) (~150 m)	◔	• The road alignment is within close proximity to an air quality sensitive receptor (Cam Lo Vuong Buddhist Community Temple) (~150 m)	
	Sub-Category Assessment		◔		◔	**Alternative 7A and 7B** are preferred equally from a noise impact perspective because both alternatives come within close proximity to one noise sensitive / air quality receptor (i.e., Cam Lo Vuong Buddhist Community Temple)
Overall Category Ranking			◑		◕	**Alternative 7B** is preferred from an overall socio-economic environment perspective for the following reasons: • Provides for an efficient development pattern that encourages aesthetic and adheres to urban design principles
Cultural Environment						
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes	◑	• No built heritage resources (BHR) lost. • Disruption to a small section of the west section of the potential cultural heritage landscape (CHL 5)	◑	• No built heritage resources (BHR) lost. • Disruption to a small section of the west section of the potential cultural heritage landscape (CHL 5)	• These alternatives do not have a significant impact on identified cultural heritage landscapes of value (They run mid-lot) • The lengthy corridor proposed for both alternatives will bring contextual change to the former agricultural CHL. • Opportunities to supports commemoration of Indigenous and Euro-Canadian settlement in Vaughan Township

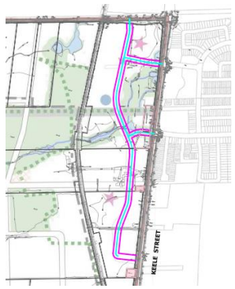
Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
	Sub-Category Assessment		◑		◑	**Alternatives 7A and 7B** are preferred equally from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • No built heritage resources are displaced • Low impact to the identified or recognized cultural heritage landscape context • Can support a commemorative heritage program
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential	◑	• Alignment is within the Ossuary Model • Stage 2 Construction Monitoring will be required • Engagement will be required for additional archaeological work	●	• No archaeological effort will be required, all areas have been previously cleared	
	Sub-Category Assessment		◑		●	**Alternative 7B** is preferred from an archeological resource perspective for the following reasons: • No further archaeological assessment work is required • Alignment is not within the Ossuary Model and no stage 2 construction monitoring is required
Overall Category Ranking			◑		◕	**Alternative 7B** is preferred from an overall cultural environment perspective for the following reasons: • No further archaeological assessment work is required • Alignment is not within the Ossuary Model and no stage 2 construction monitoring is required
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction	◔	• Longer length of road • Closer to a significant woodlot which may result in constraints / environmental mitigation measures / more complexities during construction • Complexities associated with stage monitoring within the Ossuary Model	●	• Shorter road length • Located away from the significant woodlot which results in fewer potential complications and fewer environmental mitigation measures will be required during construction	
	Cost effectiveness to build	◑	• Longer road length, however, given the difference is 235 m, additional costs are negligible	◑	• Shortest road length	
	Cost of compensation for impacts to the natural environment	◔	• Minor encroachments into the woodlot might be required which necessitates a compensation strategy	◔	• No sensitive environmental features will be impacted along the proposed alignment	

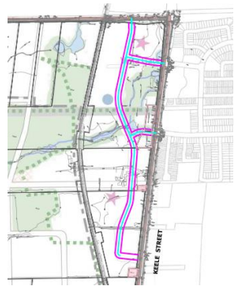
Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development	◑	• Construction works can be phased	◑	• Construction works can be phased	
	Sub-Category Assessment		◑		◕	**Alternative 7B** is preferred from an engineering feasibility and construction cost perspective for the following reasons: • Shorter road length • Avoids encroachments onto existing woodlot which avoids compensation requirements
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)	◑	• Requires relocation of existing utilities along Teston Road	◑	• Requires relocation of existing utilities along Teston Road	
	Impacts on existing municipal infrastructure	◑	• Requires relocation of Catch basins along Teston Road	◑	• Requires relocation of Catch basins along Teston Road	
	Sub-Category Assessment		◑		◑	**Alternatives 7A and 7B** are preferred equally from an existing municipal infrastructure and utilities perspective because both alternatives require relocation of existing utilities along Teston Road
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)	◑	• Higher capital cost is anticipated due to longer road length, however, given the difference is 235 m, additional costs are negligible	◑	• Lower capital cost due to smallest amount of pavement, however, given the difference is 235 m, additional costs are negligible	
	Sub-Category Assessment		◑		◑	**Alternatives 7A and 7B** are equally preferred from a capital cost perspective because difference in road length is minor and capital costs will be similar
Non-Participating Property Costs	Scale of property costs (relative scale-preferred to least preferred)	●	• Both alternatives are proposed in participating landowner lands	●	• Both alternatives are proposed in participating landowner lands	
	Sub-Category Assessment		●		●	**Alternatives 7A and 7B** are preferred equally from a property acquisition perspective because both alternatives do not require property from non-participating landowners
Operating and Maintenance Costs	Operating and maintenance costs	◑	• Higher operation costs compared to Alternative #7B as a longer route is proposed, however, given the difference is 235 m, additional maintenance costs are negligible	◑	• Lower operation costs compared to the other alternative as it is the shortest route, however, given the difference is 235 m, additional maintenance costs are negligible	
	Sub-Category Assessment		◑		◑	**Alternatives 7A and 7B** are preferred from an operating and maintenance costs perspective because the length in road are similar cost

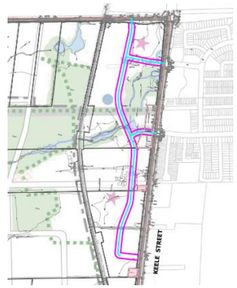
Evaluation Criteria		Alternative 7A		Alternative 7B		Comments / Rationale
						differences for operating and maintenance is negligible
Overall Category Ranking						**Alternatives 7A and 7B** are preferred from an overall cost & constructability perspective for the following reasons: • Avoids impacts to wetlands which reduces cost of compensation
OVERALL EVALUATION						**Alternative 7B was selected as the preferred Street 7 alternative for the following reasons:** • Minimizes disturbance to wildlife movement • Avoids encroachment into the woodland buffer which also avoids compensation requirements • Shorter length of road results in less impact on surface water quality and quantity of run-off • Provides for an efficient development pattern • No further archaeological assessment work is required • Alignment is not within the Ossuary Model and no stage 2 construction monitoring is required • Shorter road length which results in a lower capital, operating and maintenance costs

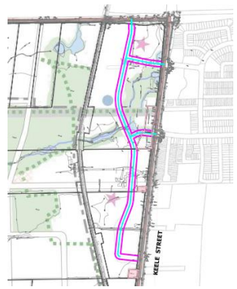
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Alternatives (Street 8)

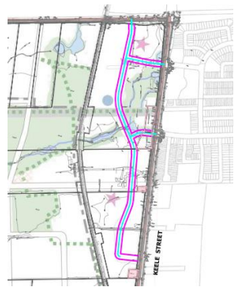
Legend: Least Benefits / Most Impacts → Most Benefits / Least Impacts

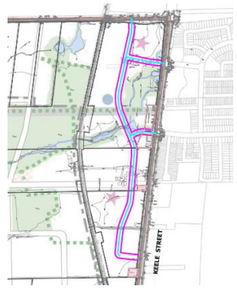
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
Transportation										
Transit Serviceability	Supports an effective future transit route		• Alternative accommodates future transit infrastructure • Provides connection to the future Kirby GO transit hub • Busses turning on steep cross slope through intersection of Street 2 and 8 is undesirable		• Alternative accommodates future transit infrastructure • Provides connection to the future Kirby GO transit hub		• Alternative accommodates future transit infrastructure • Provides connection to the future Kirby GO transit hub • Busses turning on steep cross slope through intersection of Street 2 and 8 is undesirable		• Alternative accommodates future transit infrastructure • Provides connection to the future Kirby GO transit hub	
	Sub-Category Assessment									**Alternatives 8B and 8D** are preferred equally from a transit serviceability perspective because both alternatives will accommodate future transit infrastructure, avoids requiring a steep cross-slope through the Street 2 and Street 8 intersection, and provides a connection to the future Kirby GO transit hub
Supports Active Transportation	Encourages active transportation		• Provides separated active transportation facilities for active transportation users • Steeper slopes (i.e., >5%) at intersection are undesirable for active transportation users		• Provides separated active transportation facilities for active transportation users • A flatter slope is provided at the intersections, which is more comfortable for active transportation users, however, steeper slopes are required at peak point connection.		• Provides separated active transportation facilities for active transportation users • Steeper slopes (i.e., >5%) at intersection are undesirable for active transportation users		• Provides separated active transportation facilities for active transportation users • A flatter slope is provided at the intersections, which is more comfortable for active transportation users	
	Considers pedestrian/cyclist safety		• Provides pedestrian and cyclists safety infrastructure		• Provides pedestrian and cyclists safety infrastructure		• Provides pedestrian and cyclists safety infrastructure		• Provides pedestrian and cyclists safety infrastructure	

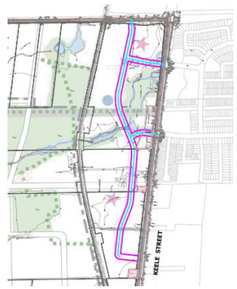
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
	Sub-Category Assessment		◑		◕		◑		◕	**Alternatives 8B and 8D** are preferred equally from an active transportation perspective because both alternatives provide the comfortable active transportation facilities for pedestrians and cyclist (flatter slopes)
Road Capacity	Provides sufficient road capacity for the projected traffic needs	○	• Distance between Street 8 and Keele Street does not provide appropriate queuing length on Collector Street 2	◕	• Provides sufficient road capacity for the projected traffic needs	○	• Distance between Street 8 and Keele Street does not provide appropriate queuing length on Collector Street 2	◕	• Provides sufficient road capacity for the projected traffic needs	
	Sub-Category Assessment		○		◕		○		◕	**Alternatives 8B and 8D** are preferred equally from a road capacity perspective because all alternatives provide sufficient road capacity for the projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards	○	• Slopes at intersection at Collector Street 2 and 8 does not meet standards	●	• Alignment complies with City and Regional design standards	○	• Slopes at intersection at Collector Street 2 and 8 does not meet standards	●	• Alignment complies with City and Regional design standards	
	Meets accessibility standards (AODA)	●	• Alignment meets AODA accessibility standards	●	• Alignment meets AODA accessibility standards	●	• Alignment meets AODA accessibility standards	●	• Alignment meets AODA accessibility standards	• Maximum slope of the road is 4.95% or less.
	Flexibility to accommodate future designs (i.e., implementation adjacent studies)	●	• Provides some flexibility to accommodate future designs	◕	• Provides some flexibility to accommodate future designs • Alignment impacts the SW corner of the proposed KirbyGO transit hub area, however station design has not been confirmed and there are opportunities to design around the road	●	• Provides some flexibility to accommodate future designs	◕	• Provides some flexibility to accommodate future designs • Alignment impacts the SW corner of the proposed KirbyGO transit hub area, however station design has not been confirmed and there are opportunities to design around the road	
	Ability to implement emerging technologies and climate change initiatives	◕	• Provides some ability to implement emerging technologies and climate change initiatives	◕	• Provides some ability to implement emerging technologies and climate change initiatives	◕	• Provides some ability to implement emerging technologies and climate change initiatives	◕	• Provides some ability to implement emerging technologies and climate change initiatives	
	Sub-Category Assessment		◔		◕		◔		◕	**Alternatives 8B and 8D** are preferred equally from a design standard compliance perspective, because both

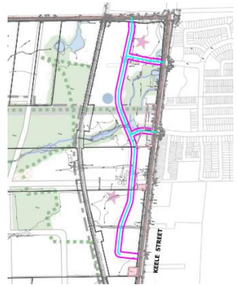
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
										alternatives meet all design standards, have the ability to accommodate future designs and emerging technologies, and provides the greatest flexibility for the future transit hub (i.e., more space)
Community Connectivity	Provides enhanced connections to major destinations for all modes	●	• Provides a north-south route for a portion of the study area • Provides a connection to the future KirbyGO transit hub	●	• Provides a north-south route for a portion of the study area • Provides a connection to the future KirbyGO transit hub	●	• Provides a north-south route for a portion of the study area • Provides a connection to the future KirbyGO transit hub	●	• Provides a north-south route for a portion of the study area • Provides a connection to the future KirbyGO transit hub	
	Contributes to flexibility of the network to allow for better access/service	◕	• Provides the Block with an additional third connection to Keele Street	◕	• Provides the Block with an additional third connection to Keele Street	◑	• Provides the Block with 2 connections to Keele Street	◑	• Provides the Block with 2 connections to Keele Street	
	Aligns with fine-grained network of streets (local, collector, and arterial)	◔	• Does not support a fine-grained network of streets • Provides a direct connection to Peak Point Blvd.	◕	• Aligns with the fine-grained network of streets • Provides a direct connection to Peak Point Blvd.	◑	• Does not support a fine-grained network of streets Does not connect with Peak Point Blvd.	◑	• Aligns with the fine-grained network of streets • Does not connect with Peak Point Blvd.	
	Sub-Category Assessment		◔		◕		◑		◑	**Alternative 8B** is preferred equally from a community connectivity perspective for the following reasons: • Provides an additional connection to Keele Street • Provides a direct connection to Peak Point Blvd.
Overall Category Ranking			◔		◕		◑		◑	**Alternative 8B** is preferred from an overall transportation perspective for the following reasons: • Avoids requiring a steep cross-slope through the Street 2 and Street 8 intersection • Flatter slope provided at the intersections is more comfortable for active transportation users, however, steeper slopes are

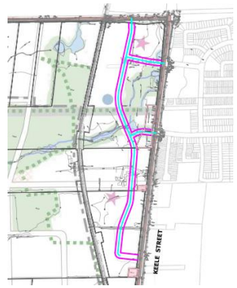
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
										required at peak point connection • Provides the Block with any additional third connection to Keele Street • Provides a direct connection to Peak Point Blvd.
Natural Environment										
Fish/Fish Habitat	Potential Impacts to fish or fish habitat	◔	• No direct fish habitat affected. • Potential negative effects on the drainage features DF3 through modification of flow conveyance and sediment transport due to crossing of DF3 upstream portions	◔	• No direct fish habitat affected. • Potential negative effects on the drainage features DF3 through modification of flow conveyance and sediment transport due to crossing of DF3 upstream portions	◔	• No direct fish habitat affected. • Potential negative effects on the drainage features DF3 through modification of flow conveyance and sediment transport due to crossing of DF3 upstream portions	◔	• No direct fish habitat affected. • Potential negative effects on the drainage features DF3 through modification of flow conveyance and sediment transport due to crossing of DF3 upstream portions	
	Level of opportunity to mitigate / minimize impact to fish and fish habitat	●	• Appropriate culvert design to maintain flow and sediment transport	●	• Appropriate culvert design to maintain flow and sediment transport	●	• Appropriate culvert design to maintain flow and sediment transport	●	• Appropriate culvert design to maintain flow and sediment transport	
	Sub-Category Assessment		◑		◑		◑		◑	**Alternatives 8A-D** are preferred equally from fish and fish habitat perspective because all alternatives have potential negative impacts and similar opportunities for mitigation
Vegetation, Wildlife, and Wildlife Habitat	Impacts to vegetation	◔	• Requires removal of art of PSW vegetation, wetland contiguous vegetation and cultural plantation	◔	• Requires removal of art of PSW vegetation, wetland contiguous vegetation and cultural plantation	◑	• Requires removal of art of PSW vegetation, wetland contiguous vegetation and cultural plantation • Avoids vegetation impacts associated with the Peak Point Blvd. connection	◑	• Requires removal of art of PSW vegetation, wetland contiguous vegetation and cultural plantation • Avoids vegetation impacts associated with the Peak Point Blvd. connection	
	Impacts to wildlife and wildlife habitat	◔	Wildlife functions include: • Habitat for common mammals and edge/urban tolerant bird species associated with removal of cultural plantation, cultural	◔	Wildlife functions include: • Habitat for common mammals and edge/urban tolerant bird species associated with removal of cultural plantation, cultural	◔	Wildlife functions include: • Habitat for common mammals and edge/urban tolerant bird species associated with removal of cultural plantation, cultural woodland and portions of hedgerows	◔	Wildlife functions lost include: • Habitat for common mammals and edge/urban tolerant bird species associated with removal of cultural plantation, cultural	

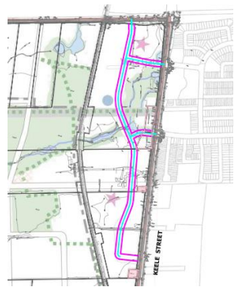
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
			woodland and portions of hedgerows • Habitat for amphibians, small mammals and common wetland bird species impacted by removal of 0.2 ha of meadow marsh		woodland and portions of hedgerows • Habitat for amphibians, small mammals and common wetland bird species impacted by removal of 0.15 ha of meadow marsh		• Habitat for amphibians, small mammals and common wetland bird species impacted by removal of 0.1 ha of meadow marsh		woodland and portions of hedgerows • Habitat for common wetland bird species will be impacted by removal of 0.06 ha of meadow marsh	
	Impacts to wildlife due to environmental fragmentation	○	• Lands east of the railway provide limited wildlife movement opportunities except along Drainage Feature DF3 to a modest extent • Would fragment PSW 11 into two smaller units and impede linkages between them	○	• Lands east of the railway provide limited wildlife movement opportunities except along Drainage Feature DF3 to a modest extent • Would have a negative fragmentation effect through removal of wetland portions in two locations as well as contiguous vegetation	○	• Lands east of the railway provide limited wildlife movement opportunities except along Drainage Feature DF3 to a modest extent • Would fragment Wetland 11 into two smaller units and impede linkages between them	◔	• Lands east of the railway provide limited wildlife movement opportunities except along Drainage Feature DF3 to a modest extent • Would result in the removal of western? portion of Wetland 17? but given its proximity with the existing railway fragmentation effect would be lower than other alternatives	
	Level of opportunity to mitigate / minimize impacts to vegetation, wildlife, and wildlife habitat	●	Opportunities for ecosystem restoration to recreate suitable habitat for wildlife (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF3)	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF3)	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF3)	●	• Opportunities for ecosystem restoration to recreate suitable habitat for wildlife (e.g., appropriate culverts to accommodate wildlife passage (amphibians, reptiles, small mammals) along Drainage Feature DF3)	
	Sub-Category Assessment		◔		◔		◔		◑	**Alternative 8D** is preferred from a designated natural heritage features and environmentally sensitive areas perspective, for the following reasons: • It minimizes wetland habitat fragmentation • Avoids environmental impacts associated with providing road connection to Peak Point Blvd.

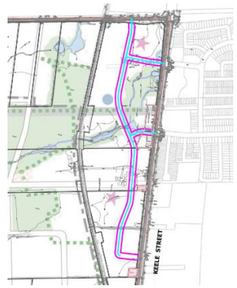
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
Designated Natural Heritage Features and Environmentally Sensitive Areas	Impacts to Provincially Significant Wetlands	○	• Removal of approximately 0.2 ha of PSW and 0.45 ha of associated 30 m buffer	○	• Removal of approximately 0.15 ha of PSW and 0.57 ha of associated 30 m buffer	○	• Removal of approximately 0.1 ha of PSW and 0.31 ha of associated 30 m buffer	◑	• Removal of approximately 0.06 ha of PSW and 0.26 ha of associated 30 m buffer	
	Impacts to Significant Woodland	◔	• No Significant Woodland affected	◔	• No Significant Woodland	◔	• No Significant Woodland affected	◔	• No Significant Woodland affected	
	Impacts to Significant Wildlife Habitat (SWH)	◑	• No SWH affected	◑	• No SWH affected	◑	• No SWH affected	◑	• No SWH affected	
	Level of opportunity to mitigate / minimize impacts to designated natural heritage features and environmentally sensitive areas	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland habitat	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland habitat	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland habitat	●	• Wetland restoration along Drainage Feature DF3 would compensate for the loss of wetland habitat	
	Sub-Category Assessment		◔		◔		◔		◑	**Alternative 8D** is preferred from a designated natural heritage features and environmentally sensitive areas perspective has the least ecological effects for the following reasons: • Requires the least amount of PSW removal
Rare Species, Species of Conservation Concern, and Species at Risk (SAR)	Impacts to rare species and their habitat	◑	• No rare species have been recorded within footprint	◑	• No rare species have been recorded	◑	• No rare species have been recorded within footprint	◑	• No rare species have been recorded within footprint	
	Impacts to Species of Conservation Concern and their habitat	◑	• No impacts to Species of Concern anticipated to result	◑	• No impacts to Species of Concern anticipated to result	◑	• No impacts to Species of Concern anticipated to result	◑	• No impacts to Species of Concern anticipated to result	
	Impacts to Species at Risk (Endangered or Threatened) and their habitat	◑	• No endangered or threatened species been recorded within footprint	◑	• No endangered or threatened species been recorded within footprint	◑	• No endangered or threatened species been recorded within footprint	◑	• No endangered or threatened species been recorded within footprint	
	Sub-Category Assessment		◑		◑		◑		◑	**Alternatives 8A-D** are preferred equally from a rare species, species of conservation concern, and endangered or threatened perspective because there are none recorded within any of the alignment footprints.

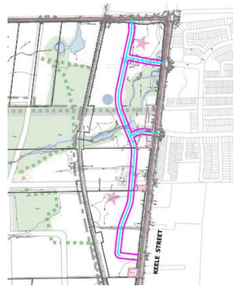
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
	Overall Category Ranking									**Alternative 8D** is preferred from an overall Natural Environment perspective for the following reasons: • Minimizes wetland habitat fragmentation • Avoids environmental impacts associated with providing road connection to Peak Point Blvd. • Requires the least amount of PSW removal
Hydrogeology / Ground Water	Potential to affect the quality of groundwater resources		• Alternative 8A is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management		• Alternative 8B is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management		• Alternative 8C is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management		• Alternative 8D is not located in an area mapped as having highly vulnerable aquifers. No significant impact to groundwater quality anticipated with BMPs in place for road salt management	
	Potential to affect the quantity of groundwater resources		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction		• No significant impact to recharge anticipated from road construction	
	Potential to affect the movement of groundwater resources		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement		• No anticipated impact to groundwater movement	
	Potential to affect Wellhead Protection / Recharge Area		• Alternative 8A is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 8B is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 8C is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction		• Alternative 8D is located in an area mapped as an SGRA and in a WHPA-Q; however, no significant impact to recharge anticipated from road construction	
	Potential to affect drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water		• Area will be municipally serviced for drinking water	
	Sub-Category Assessment									**Alternatives 8A-D** are preferred equally from a hydrogeology / ground water perspective because significant impacts are not anticipated for any of the alternatives.

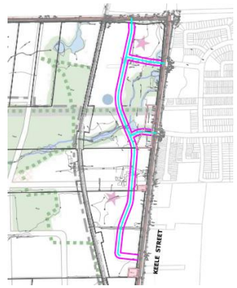
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
Surface Water and Drainage	Potential to affect surface water quality and quantity		• The third shortest length of road and therefore limited impact on surface water quality and quantity (Road Length = 1583 m)		• The longest length of road and therefore greatest impact on surface water quality and quantity (Road Length = 1831 m)		• The length of road is similar with Alternative 8D and is the shortest length with similar impact on surface water quality and quantity (Road Length = 1453 m)		• The length of road is similar with Alternative 8C and is a short length with similar impact on surface water quality and quantity (Length = 1501 m)	
	Provides sufficient drainage		• Runoff will be drained via storm sewers and catchbasins and treated in SWM facilities		• Runoff will be drained via storm sewers and catchbasins, and treated in SWM facilities		• Runoff will be drained via storm sewers and catchbasins and treated in SWM facilities		• Runoff will be drained via storm sewers and catchbasins and treated in SWM facilities	
	Sub-Category Assessment									**Alternatives 8C and 8D** are preferred equally from a surface water and drainage perspective for the following reasons: • Shorter road lengths, therefore less impact on surface water quality and quantity and similar impacts on surface water quality and quantity
Floodplain	Effects on designated floodplains (i.e., amount of floodplain crossed (metres))		• The length of floodplain crossing is approximately 30 m • More impact to floodplain than alternative 8C due to floodplain encroachment at the Peak Point Blvd. connection		• The length of floodplain crossing approximately 60 m • More impact to floodplain than alternative 8D due to floodplain encroachment at the Peak Point Blvd. connection		• The length of floodplain crossing is approximately 30 m		• The length of floodplain crossing is approximately 60 m	
	Level of opportunity to mitigate / minimize impacts to floodplains		• By appropriate sizing (within reasonable range) of crossing the impact can be mitigated		• By appropriate sizing (within reasonable range) of crossing the impact can be mitigated		• By appropriate sizing (within reasonable range) of crossing the impact can be mitigated		• By appropriate sizing (within reasonable range) of crossing the impact can be mitigated	
	Sub-Category Assessment									**Alternative 8C** is preferred from a floodplain perspective for the following reasons: • Shortest floodplain crossing length • Avoids floodplain encroachment at the Peak Point Blvd. connection

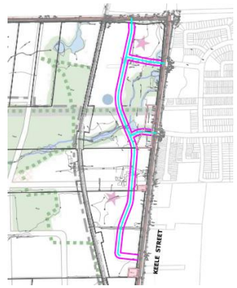
Evaluation Criteria		Alternative 8A	Alternative 8B	Alternative 8C (Alternative 8A without Peak Point Connection)	Alternative 8D (Alternative 8B without Peak Point Connection)	Comments / Rationale
						
Overall Category Ranking						**Alternative 8C** is preferred from an overall Hydrogeology and Drainage perspective for the following reasons: • Shortest road length, therefore least impact on surface water quality and quantity • Shortest floodplain crossing length • Avoids floodplain encroachment at the Peak Point Blvd. connection
Socio-Economic Environment						
Land-Use Policy Compliance	Conformity with Provincial, Regional, and municipal policy objectives		• Conforms with Provincial, Regional, and municipal policy objectives		• Conforms with Provincial, Regional, and municipal policy objectives		• Conforms with Provincial, Regional, and municipal policy objectives		• Conforms with Provincial, Regional, and municipal policy objectives	
	Sub-Category Assessment									**Alternatives 8A-D** are preferred equally from a policy compliance perspective because all alternatives conform with provincial, regional, and municipal policy objectives
Future Land Uses	Level of service to proposed land uses		• Provides sufficient level of service is provided to proposed land uses • Challenges with providing driveway for properties north and south of Collector Street 2 on Keele Street		• Provides sufficient level of service is provided to proposed land uses		• Provides sufficient level of service is provided to proposed land uses • Challenges with providing driveway for properties north and south of Collector Street 2 on Keele Street		• Provides sufficient level of service is provided to proposed land uses	
	Sub-Category Assessment									**Alternatives 8B and 8D** are preferred equally from a future land use perspective because both alternatives provide sufficient LOS to proposed land uses and can more easily accommodate driveways for properties north and south of Collector Street 2 on Keele Street

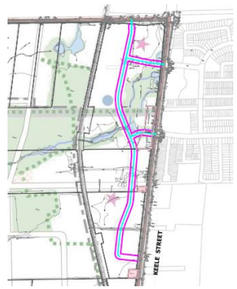
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
Non-Participating Property Impacts	Impacts to non-participating properties	◑	2 non-participating landowners	◑	• 2 non-participating landowners	●	• No impact to non-participating landowners	●	• No impact to non-participating landowners	
	Sub-Category Assessment		◑		◑		●		●	**Alternative 8C & 8D** are preferred from a non-participating property impacts perspective because both alternatives do not require impacts to non-participating landowners
Noise and Air Quality Impacts	Impacts on noise and vibration sensitive receptors	◑	• Road alignment is not within close vicinity to any noise or vibration sensitive receptors within Block 27 • It is anticipated that noise from Jane Street would be louder than noise generated from Street 8 traffic	◑	• Road alignment is not within close vicinity to any noise or vibration sensitive receptors within Block 27 • It is anticipated that noise from Jane Street would be louder than noise generated from Street 8 traffic	◑	• Road alignment is not within close vicinity to any noise or vibration sensitive receptors within Block 27 • It is anticipated that noise from Jane Street would be louder than noise generated from Street 8 traffic	◑	• Road alignment is not within close vicinity to any noise or vibration sensitive receptors within Block 27 • It is anticipated that noise from Jane Street would be louder than noise generated from Street 8 traffic	
	Impacts on air quality	◑	• Road alignment is not within close vicinity to any air quality sensitive receptors within Block 27	◑	• Road alignment is not within close vicinity to any air quality sensitive receptors within Block 27	◑	• Road alignment is not within close vicinity to any air quality sensitive receptors within Block 27	◑	• Road alignment is not within close vicinity to any air quality sensitive receptors within Block 27	
	Sub-Category Assessment		◑		◑		◑		◑	**Alternative 8A-D** are preferred equally from a noise and air quality impact perspective because none of the alternatives are within close vicinity to any noise, vibration, or air quality sensitive receptors within Block 27.
Overall Category Ranking			◑		◑		◕		●	**Alternative 8D** is preferred from an overall Socio-Economic Environment perspective for the following reasons: • Can more easily accommodate driveways for properties north and south of Collector Street 2 on Keele Street • Does not require impacts to non-participating landowners

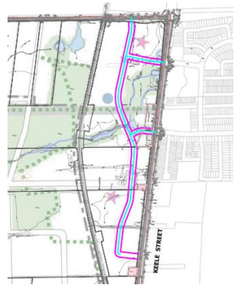
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
Cultural Environment										
Built Cultural Resources and Cultural Heritage Landscapes	Impact to built cultural heritage resources or cultural heritage landscapes		• No built heritage resources (BHR) lost. • Disruption to municipally listed cultural heritage landscape (CHL 7) • The roadway is near to the south side of the residence and barn. Physical disruption to identified CHL #5 and CHL#6		• No built heritage resources (BHR) lost. • Disruption to municipally listed cultural heritage landscape (CHL 7). Physical disruption to identified CHLs #5 and CHL #6.		• No built heritage resources (BHR) lost. • Disruption to municipally listed cultural heritage landscape (CHL 7). The roadway is near to the south side of the residence and barn. Physical disruption to identified CHLs #5 and CHL #6		• No built heritage resources (BHR) lost. • Disruption to municipally listed cultural heritage landscape (CHL 7). Physical disruption to identified CHLs #5 and CHL #6.	• Alternatives 8B and 8C run parallel to the rail tracks CHL6 is less disruptive to the CHL context. Alternatives A and D run through a Listed property with built resources leaving potential adjacency impacts related to isolation. • Opportunities to support a commemorative heritage interpretation program
	Sub-Category Assessment									**Alternative 8D** is preferred from a built cultural resources and cultural heritage landscapes perspective for the following reasons: • Fewer direct impacts to cultural heritage resources. • Adjacent rail corridor reduces potential effects from displacement or disruption
Archaeological Resources	Impacts to previously undisturbed lands with archaeological potential		• Highest degree of fieldwork requirements compared to Alternative 8D • Stage 2 survey will be required for parcels 22 and 23. • A Stage 3 cemetery investigation will be required due to the proximity of the Hope Primitive Methodist Church & Cemetery (Parcel 24) • Stage 2 Construction monitoring will be required for areas within the Ossuary Model		• High degree of fieldwork requirements compared to Alternative 8D • Stage 2 survey will be required for parcels 22 and 23. • Stage 2 Construction monitoring will be required for areas within the Ossuary model.		• High degree of fieldwork requirements compared to Alternative 8D • A Stage 3 cemetery investigation will be required due to the proximity of the Hope Primitive Methodist Church & Cemetery (Parcel 24) • Stage 2 Construction monitoring will be required for areas within the Ossuary Model		• No further archaeological assessment is required • Stage 2 Construction monitoring will be required for areas within the Ossuary Model	• All alignments require Stage 2 Construction Monitoring within the Ossuary Model.
	Sub-Category Assessment									**Alternative 8D** is preferred from an archeological resource

Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
										perspective for the following reasons: • Least amount of additional archaeological assessment is required
Overall Category Ranking										**Alternative 8D** is preferred from an overall cultural environment perspective for the following reasons: • Fewer direct impacts to cultural heritage resources. • Adjacent rail corridor reduces potential effects from displacement or disruption • Least amount of additional archaeological assessment is required
Cost & Constructability										
Engineering Feasibility and Construction Cost	Ease of Construction		• There may be challenges in obtaining an approved design given the anticipated slopes • Width of wetland 11 is not consistent and may require a complicated crossing structure • Less earthworks and excavation are required compared to Alternatives 8B and 8D • Additional construction costs associated with Stage 2 Construction Monitoring within the Ossuary Model		• Higher excavation and earthworks are required to proximity to Collector Street 2 • Stage 2 Construction Monitoring within the Ossuary Model is required		• There may be challenges in obtaining an approved design given the anticipated slopes • Width of wetland 11 is not consistent and may require a complicated crossing structure • Less earthworks and excavation are required compared to Alternatives 8B and 8D • Fewer construction costs and complications due to removing road connection to Peak Point Blvd. • Additional construction costs associated with Stage 2 Construction Monitoring within the Ossuary Model		• Higher excavation and earthworks are required to proximity to Collector Street 2 • Due to no peak point connection, this option is better than Alternative 8B • Stage 2 Construction Monitoring within the Ossuary Model is required	For all the alternatives encroachments into the NHS and to the PSW should be taken into consideration
	Cost effectiveness to build		• Third shortest road, therefore, third highest cost • Less earthworks and excavation are required		• Longest road, therefore, highest cost • Higher excavation and earthworks are required to		• Shortest road, therefore least cost • Less earthworks and excavation are required compared to Alternative B and D.		• Second shortest road, therefore second lower cost option	

Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
			compared to Alternative 8B and 8D		proximity to Collector Street 2		• Due to no peak point connection, this option is better than Alternative 8A		• Higher excavation and earthworks are required to proximity to Collector Street 2 • Due to no peak point connection, this option is better than Alternative 8B.	
	Cost of compensation for impacts to the natural environment		• Second most Encroachment into PSW, floodplain and its buffers		• Most Encroachment into PSW, floodplain and its buffers		• Second least Encroachment into PSW, floodplain and its buffers		• Least encroachment into PSW, floodplain and its buffers	
	Opportunities to phase offset initial costs and provide infrastructure in lock step with development		• Construction works can be phased		• Construction works can be phased		• Construction works can be phased		• Construction works can be phased	
	Sub-Category Assessment									**Alternatives 8C is** preferred from an engineering feasibility and construction cost perspective for the following reasons: • Shortest road length, therefore lowest construction costs are anticipated • Shortest floodplain crossing • Less earthworks and excavation
Existing Municipal Infrastructure and Utilities	Conflict with existing utilities or challenges in relocating infrastructure (temporary or permanent)		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline	
	Impacts on existing municipal infrastructure		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline		• Existing Infrastructure to be relocated and requires crossing of TCE pipeline	
	Sub-Category Assessment									**Alternatives 8A-D** are preferred equally from an existing municipal infrastructure and utilities perspective because all alternatives will require existing

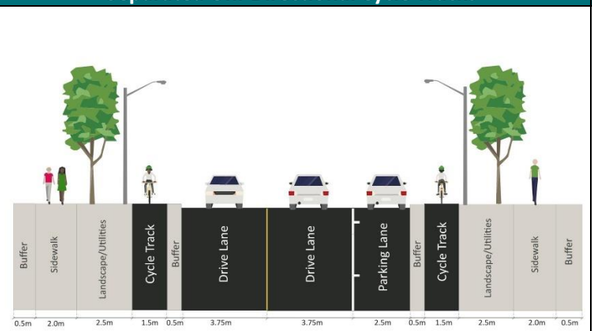
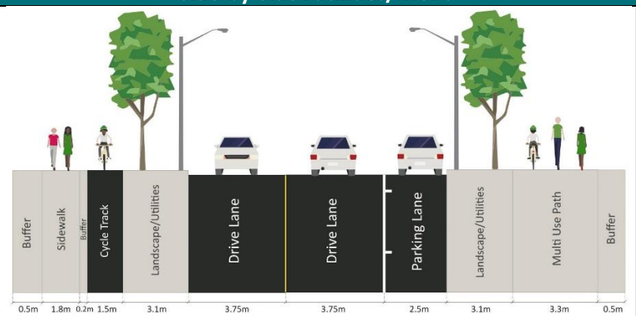
Evaluation Criteria		Alternative 8A		Alternative 8B		Alternative 8C (Alternative 8A without Peak Point Connection)		Alternative 8D (Alternative 8B without Peak Point Connection)		Comments / Rationale
										
			infrastructure to be relocated and requires crossing of TCE pipeline							
Capital Cost	Scale of capital costs (relative scale-preferred to least preferred)		• Third smallest capital cost due to third smallest amount of pavement • Smallest floodplain crossing		• Highest capital cost due to longest length and • Larger crossing requirement		• Smaller capital cost than options 8A and 8B due to smaller amount of pavement • Smallest floodplain crossing		• Smaller capital cost than options 8A and 8B due to smaller amount of pavement, however • Requires a larger crossing	
	Sub-Category Assessment									**Alternatives 8C is** preferred from a capital cost perspective for the following reasons: • Shortest length • Shortest floodplain crossing
Non-Participating Property Costs	Scale of non-participating property costs (relative scale-preferred to least preferred)		• 45 m within non-participating landowners		• 45 m within non-participating landowners		• No crossing of non-participating landowners		• No crossing of non-participating landowners	
	Sub-Category Assessment									From a property acquisition perspective, **Alternatives 8C and 8D** are preferred for the following reasons: • No land requirement from non-participating landowners
Operating and Maintenance Costs	Operating costs		• The third smallest cost operation since it is the third shortest route		• The greatest cost operation since it is the longest route		• Lowest cost operation since it is the shortest route		• The second smallest cost operation since it is the second shortest route	
	Scale of maintenance costs		• third highest maintenance cost due to third highest amount of pavement		• highest maintenance cost due to highest amount of pavement and longer crossing requirement.		• Lowest maintenance cost due to smaller amount of pavement than options 8A and 8B		• Lower maintenance cost due to smaller amount of pavement than options 8A and 8B however requires a larger crossing than option 8C	
	Level of maintenance and operation required		• High maintenance cost due to third highest amount of pavement		• Highest maintenance cost due to highest amount of pavement and longer crossing requirement.		• Lowest maintenance cost due to smaller amount of pavement than other alternatives.		• Lower maintenance cost due to smaller amount of pavement than options 8A and 8B, however requires a larger crossing than option 8C	
	Sub-Category Assessment									**Alternatives 8C is** preferred from an operating and

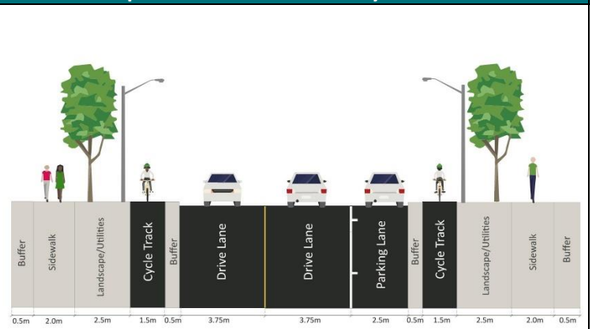
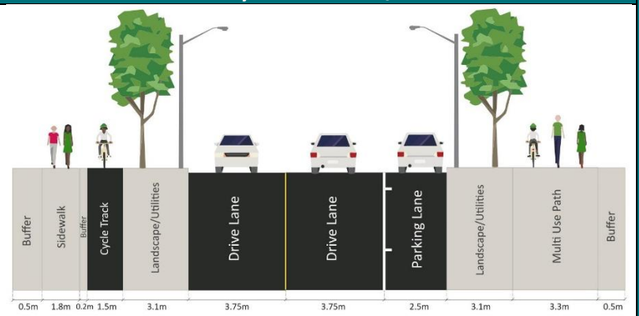
Evaluation Criteria	Alternative 8A	Alternative 8B	Alternative 8C (Alternative 8A without Peak Point Connection)	Alternative 8D (Alternative 8B without Peak Point Connection)	Comments / Rationale
					maintenance costs perspective for the following reasons: • Shortest length • Less pavement • Shortest crossing of floodplain
Overall Category Ranking					**Alternative 8C** is preferred from an overall cost & constructability perspective for the following reasons: • Shortest length of road, therefore lowest construction, operation, and maintenance costs • Avoids construction costs and complexities associated with a road connection to Peak Point Blvd., thereby reducing construction costs and complexities • Shortest floodplain crossing • Less earthworks and excavation • No land requirement from non-participating landowners
OVERALL EVALUATION					**Alternative 8D was selected as the preferred Street 8 alternative for the following reasons:** • Minimizes wetland habitat fragmentation • Avoids environmental impacts associated with providing road connection to Peak Point Blvd. • Requires the least amount of PSW removal • Can more easily accommodate driveways for properties north and south of Collector Street 2 on Keele Street • Does not require impacts to non-participating landowners

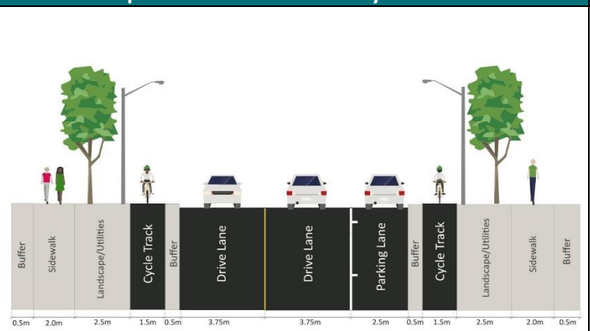
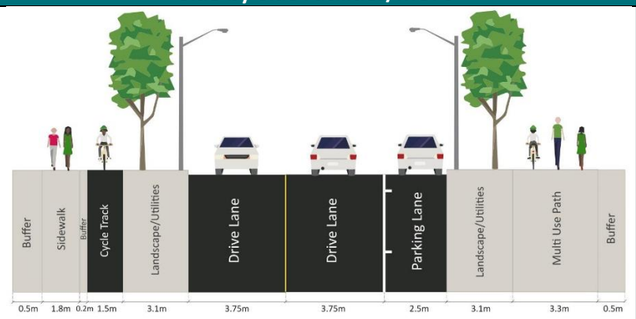
Evaluation Criteria	Alternative 8A	Alternative 8B	Alternative 8C (Alternative 8A without Peak Point Connection)	Alternative 8D (Alternative 8B without Peak Point Connection)	Comments / Rationale
					• Fewer direct impacts to cultural heritage resources. • Adjacent rail corridor reduces potential effects from displacement or disruption • Least amount of additional archaeological assessment is required

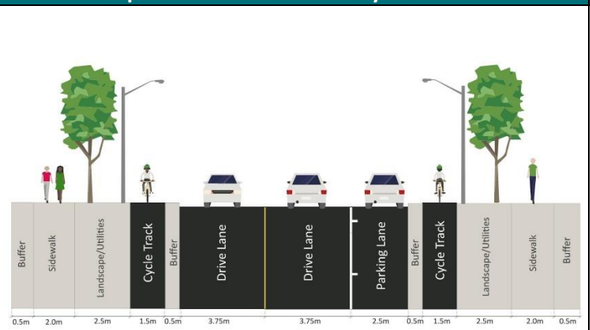
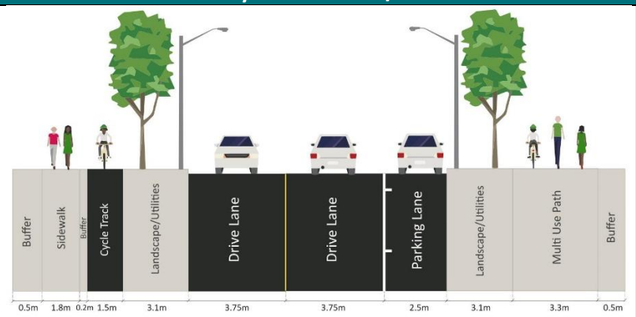
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 1 – Minor Collector)

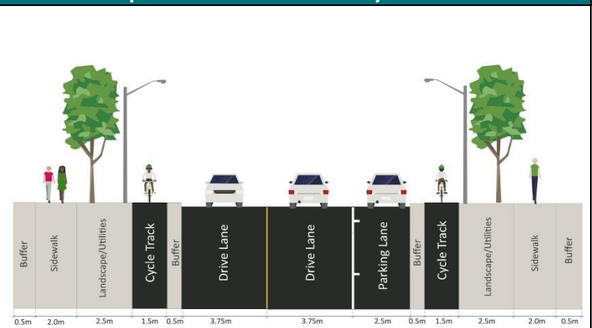
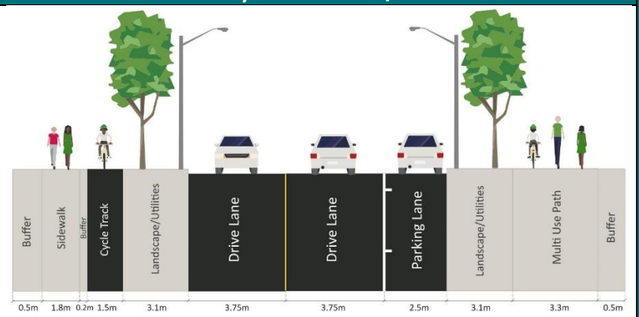
Legend:

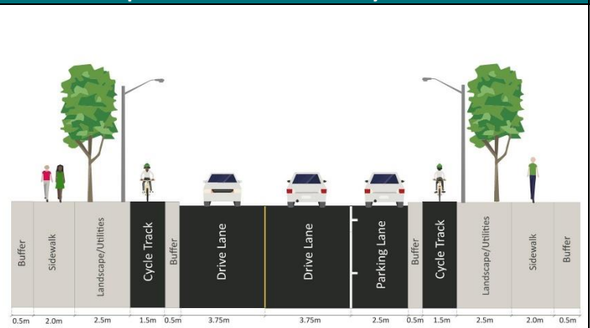
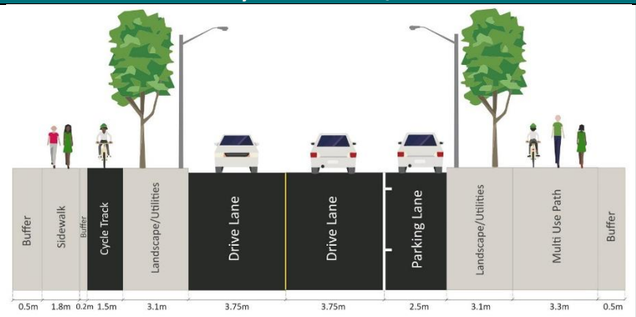
Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Transportation						
Active Transportation Road Safety	Achieves complete street principles	◔	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Decreased perception of safety given presence of driveways and opportunities for conflicts which could discourage active modes of transportation	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Increased perceived cyclist comfort and safety will encourage users of schools, parks and mixed-use areas	
	Considers pedestrian/cyclist safety **Note**: Collector Street 1 is along low-rise mixed use, schools and SWM ponds, park, and the Community Hub (CH) with low-rise residential uses across the CH	●	• Provides safe conditions due to the low and mid-rise residential and low-rise mixed-use and community hub along Collector Road 1 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	◑	• Provides less favourable conditions compared to Alternative C1-MI1 (uni-directional cycle track) due to the low and mid-rise residential uses along Collector Road 1 (i.e., greater points of conflicts) • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	
	Achieves Vision Zero objectives	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	
	Sub-Category Assessment		●		◔	**Alternative C1-MI1** is preferred from an active transportation road safety perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safe conditions due to the low and mid-rise residential and low-rise mixed-use and community hub along Collector Road 1

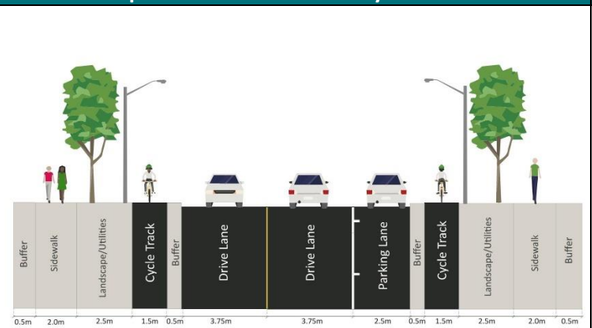
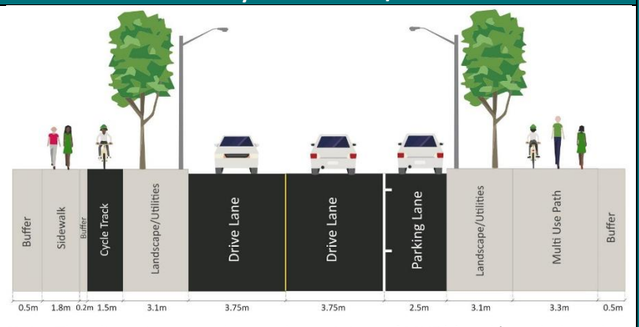
Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Provides off-street separated facilities for both pedestrians and cyclists which enhances safety • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities
Transit Serviceability	Accommodates future transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Ability to convert the parking lane, bike lane, or wide landscape/utilities into a lane to adapt to changing options in transit service provision	◑	• Ability to convert the parking lane, bike lane, or landscape/utilities into a lane to adapt to changing options in transit service provision	
	Sub-Category Assessment	◕		◕		**Alternatives C1-M1** and **C1-M2** are preferred equally from a transit serviceability perspective for the following reasons: • Both alternatives can accommodate future transit infrastructure • Both alternatives have the ability to convert the parking lane, bike lane, or landscape / utilities into a lane to adapt to changing options in transit service provision
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	●	• Provides 2.0 m sidewalks and minimal bike lane width of 1.5 m which meet City standards for AT facilities	●	• Provides 1.8 m sidewalks/1.5 m bike lanes or 3.3 m MUP which meet City standards for AT facilities	
	Opportunities to include enhanced safety features (e.g., separated/wider clearways) and comfortable for all users)	●	• Pedestrians are separated by a 2.5 m landscape / utilities buffer which enhances safety and provides opportunities to implement safety features • Cyclists have a 0.5 m buffer from travel lane in each direction	●	• Pedestrians and cyclists are off-street and separated by a 3.1 m landscape / utilities buffer from travel lanes which enhances safety and provides opportunities to implement safety features	
	Sub-Category Assessment	●		●		**Alternatives C1-MI1 and C1-MI2** are equally preferred from an active transportation perspective for the following reasons: • Both alternatives provide required sidewalk and cycle track facility widths • Both alternatives have wide landscape and utility facility / buffers which enhances safety and provides opportunities to implement safety features
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	

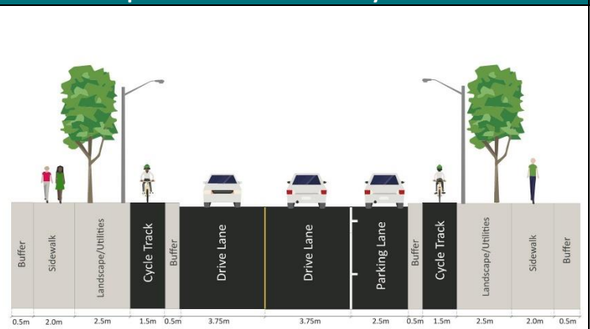
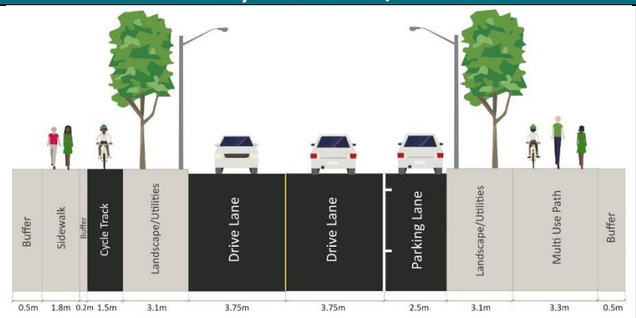
Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment					**Alternatives C1-MI1 and C1-MI2** are preferred equally from a road capacity perspective for the following reasons: • Both alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards		• Sidewalk and bike lane widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • City requires the provision of cycle tracks on both sides of collector roads, and prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road, and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.		• MUP / side-by-side facility widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.8 m sidewalk is provided which exceeds AODA's 1.5 m requirement		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.3 m multi-use path or 3.5 m side-by-side facilities are provided for pedestrians and cyclists	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
	Sub-Category Assessment					**Alternative C1-MI1 and C1-MI2** are preferred equally from a design standard compliance perspective following reasons: • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Parking lane, landscaped area and bike lanes could be used to accommodate future designs
Community Connectivity	Provides enhanced connections to major destinations for all modes		• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations		• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	

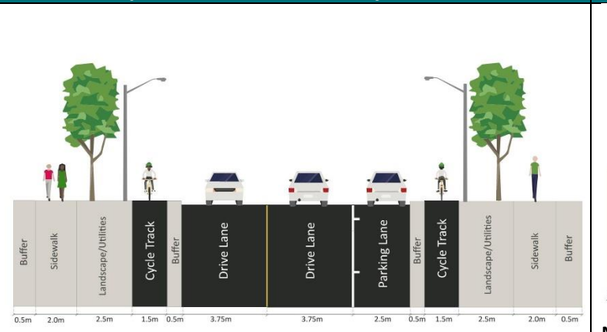
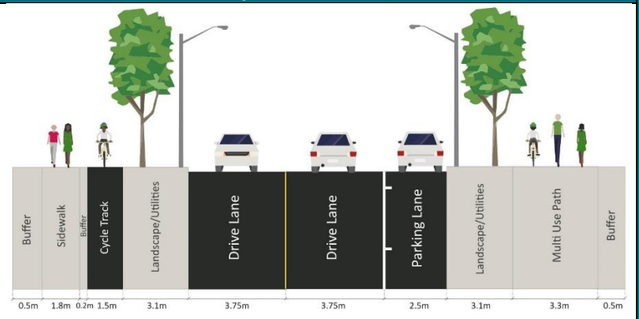
Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment					**Alternative C1-MI1 and C1-MI2** are preferred equally from a community connectivity perspective for the following reasons: • Both alternatives provide enhanced connections for vehicles, pedestrians and cyclists to reach major destinations
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)		• Alternative provides separated pedestrian and cycling pathways • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways		• Alternative provides multi use pathways for both pedestrians and cyclists • MUP/side-by-side facilities provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities		• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Cycle track results in a greater distance for pedestrians to cross the street (less comfortable, but safe) • Cycle tracks are separated from travel/parking lane by a 0.5 m buffer		• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater potential for collisions between cyclists and pedestrians since cycling facilities are mixed/next to the sidewalk which may not be preferred by children or seniors • Off-street cycling facilities results in a shorter distance for pedestrians to cross the street (increased comfort)	
	Allows for streetscape / street furniture to enhance user experience		• Wide landscape buffer provides opportunities for street furniture / streetscape		• Wide landscape buffer provides opportunities for street furniture / streetscape	
	Sub-Category Assessment					**Alternative C1-MI1** is preferred from a quality and sustainable public realm perspective for the following reasons: • Alternative provides pedestrian and cycling facilities with a wide buffer which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways
Overall Category Ranking						**Alternative C1-MI1** is the preferred cross-section from an overall Transportation perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards

Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Provides safe conditions due to the low and mid-rise residential and low-rise mixed-use and community hub along Collector Road 1 • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities • Alternative provides greater separation between pedestrian and cycling facilities which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways
Socio-Economic Environment						
Supports Surrounding Land-Uses	Conforms with land-use policy objectives		• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)		• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	

Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan			
	Supports surrounding land-uses		• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses		• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • MUPs are less favourable compared to uni-directional cycle tracks given the surrounding residential land-uses	
	Encourages aesthetic and adheres to urban design principles		• Provides a large landscape width for street trees which improves aesthetics • Moderate amount of continuous pavement without buffer which decreases aesthetics		• Provides a large landscape width for street trees which improves aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which improves aesthetics	
	Sub-Category Assessment					**Alternatives C1-MI1** is preferred from a land-use perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses • Provides large landscaping area which improves aesthetics
Climate Change	Ability to address climate change		• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width to implement LID and tree canopy which will increase evapotranspiration to help address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives		• Moderate imperviousness expected for this cross section • The placement of the bike lane and/ parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area		• Moderate imperviousness expected for this cross section • Due to the parking lane, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.

Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Moderate boulevard width will provide some opportunities for LIDs			
	Sub-Category Assessment		◑		◑	**Alternatives C1-MI1 and C1-MI2** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change LID can be easily implemented within the landscape area adjacent to the pavement • Moderate imperviousness expected for this cross section • Due to the parking/cycle track, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs
Overall Category Ranking			◕		◑	**Alternative C1-MI1** is the preferred cross-section from a Socio-Economic environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycle facilities are favorable given the surrounding residential land-uses • Provides a large landscape width for street trees which improves aesthetics • Moderate imperviousness with moderate ability to address climate change
Cost & Constructability						
Engineering Feasibility, Capital, Operational, and	Ease of Construction	◕	• Construction of roadway with on-street uni-directional bike lanes is standard within the City of Vaughan and construction is not anticipated to be complex	◕	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as	

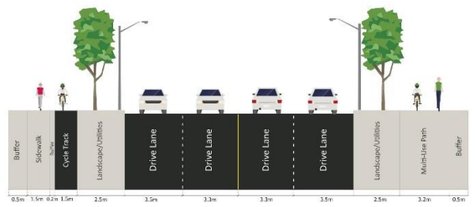
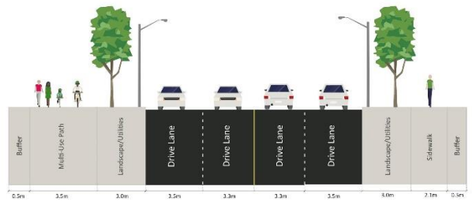
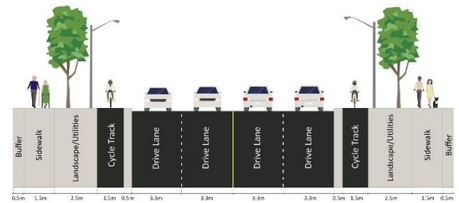
Evaluation Criteria		Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks		Alternative C1 - MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Maintenance Cost			• The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area		they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	
	Scale of capital costs (relative scale-preferred to least preferred)	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking		◑		◑		**Alternatives C1-MI1 and C1-MI2** are equally preferred cross-sections from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facility or MUP/side-by-side facilities are standard within the City of Vaughan and complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar
OVERALL EVALUATION		◕		◑		**Alternative C1-MI1 is the preferred cross-section for Street 1 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safe conditions due to the low and mid-rise residential and low-rise mixed-use and community hub along Collector Road 1 • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Alternative provides separated pedestrian and cycling pathways which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways • Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities

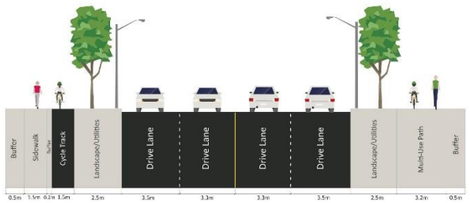
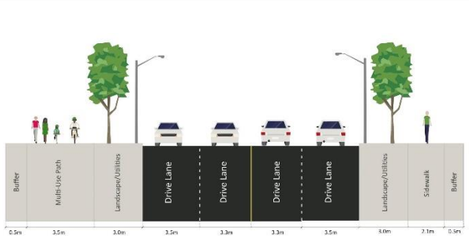
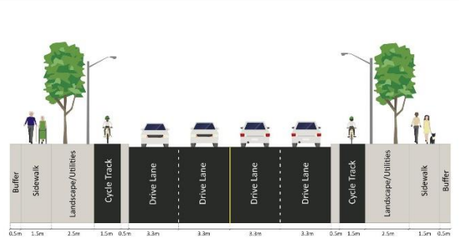
Evaluation Criteria	Alternative C1 - MI1 Separated Uni-Directional Cycle Tracks	Alternative C1 - MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Provides active transportation facilities on both sides of the road which provides safer and more convenient access to/from adjacent land-uses • Moderate imperviousness and landscape width with moderate ability to address climate change

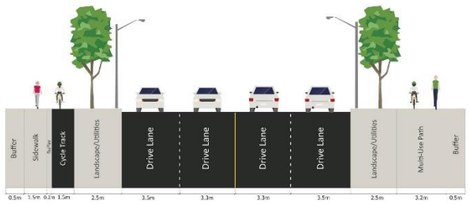
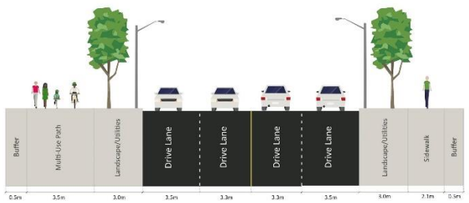
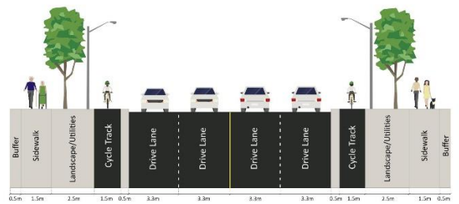
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 2 – Major Collector)

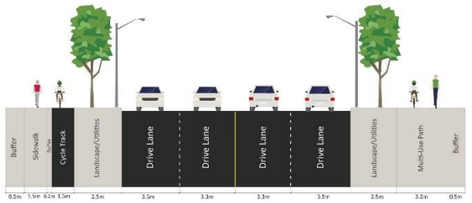
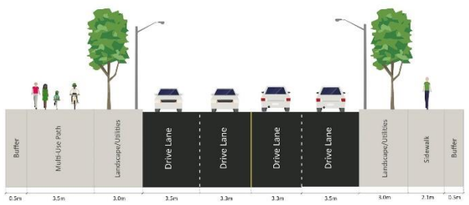
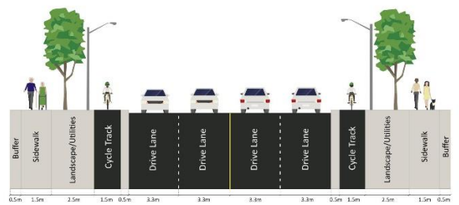
Legend:

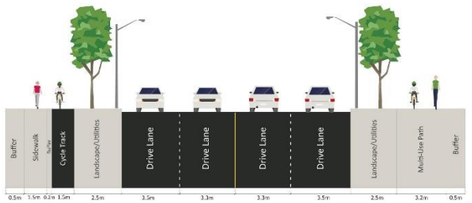
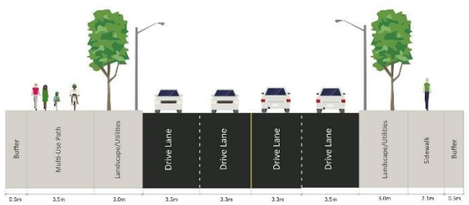
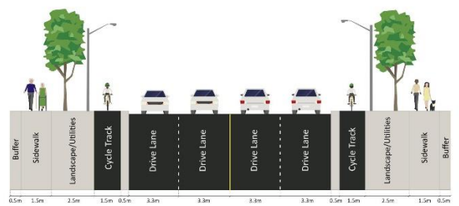
○ Least Benefits / Most Impacts → ◔ ◑ ◕ ● Most Benefits / Least Impacts

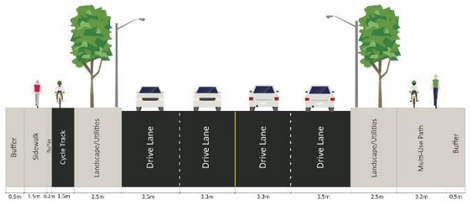
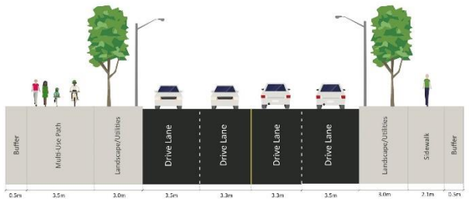
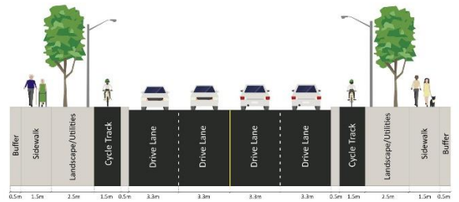
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
Transportation								
Active Transportation Road Safety	Achieves complete street principles	◕	• Achieves complete street principles • Provides adequate infrastructure for all roadway users	◑	• Achieves complete street principles on one side of the road (partial) • No cycling infrastructure on one side of road	◕	• Achieves complete street principles • Provides adequate infrastructure for all road users • Decreased perception of bicycle safety given proximity of bicycle lane to vehicle lanes which offers less support for community hub and GO Station to be accessed via bicycle	
	Considers pedestrian/cyclist safety	◔	• Provides less favourable condition compared to Alternative C2-MA3 (separated uni-directional cycle tracks) given the low-rise mixed land-uses along both sides of Collector Street 2 and mid-rise residential land-uses east of the railway • Shared multi-use path for both pedestrians and cyclists outside of the travel lanes • Pedestrian facilities mixed with cycling facilities which increases risk of collisions	◑	• Provides less favourable condition compared to Alternative C2-MA3 (separated uni-directional cycle tracks) given the low-rise mixed land-uses along both sides of Collector Street 2 and mid-rise residential land-uses east of the railway, however the reduction of MUP to one side of street increases safety from a cyclist-car collision perspective • Wide 3.5 m multi-use pathway for pedestrians and cyclists outside of the travel lanes • Pedestrian facilities mixed with cycling facilities in MUP which increases risk of collisions • Cycle tracks are not provided on one side of the street and will require cyclists to cycle on-street	◕	• Provides safer condition given there are low-rise mixed land-uses along both sides of Collector Street 2 and mid-rise residential land-uses east of the railway • Cycling facilities are at the minimum standard width along with a buffer between cyclists and travel lane • Pedestrians and cyclists are in separated facilities which minimizes potential collisions	
	Achieves Vision Zero objectives	◕	• Separated pedestrian and cycling facilities from vehicle traffic	◔	• Separated pedestrian and cycling facilities from vehicle traffic • Cyclists will need to cycle on-street on one side of the road	◕	• Separated pedestrian and cyclist facilities	

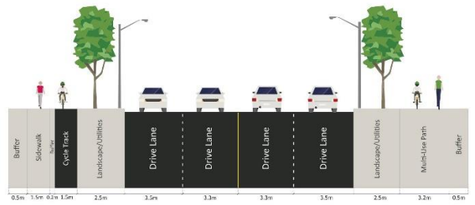
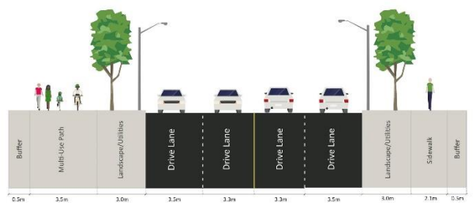
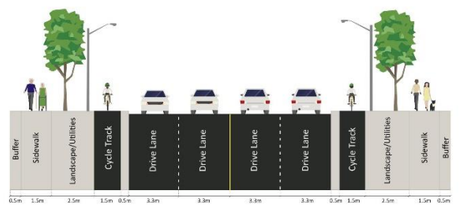
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Sub-Category Assessment		◑		◑		◕	From an AT road safety perspective, **Alternative C2-MA3** is preferred for the following reasons: • Achieves complete street principles and provides adequate infrastructure for all road users • Provides a safer condition given the low-rise mixed land-uses along both sides of Collector Street 2 and mid-rise residential land-uses east of the railway • Pedestrians and cyclists are in separated facilities which minimizes potential collisions • Avoids mixing pedestrians and cyclists on the same facility
Transit Serviceability	Accommodates transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	○	• Roadway cannot accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision	○	• Roadway cannot accommodate future transit route	
	Sub-Category Assessment		◕		◕		○	From a transit serviceability perspective, **Alternatives C2-MA1 and C2-MA2** are preferred equally for the following reasons: • Can accommodate future transit route and there are areas available to be converted into alternative options for changing option in transit service provisions
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	◑	• Provides multi-use paths or side-by-side facilities with a width of 3.2 m	◔	• Multi-use path provides shared facility for pedestrians and cyclists totalling 3.5 m • The MUP would need to be shared with two-way cyclists and pedestrians which may increase potential conflicts	◕	• Provides 1.5m bike lane width • Provides 1.5m sidewalks • Provides minimum required sidewalk/bike lane widths which meet City of Vaughan requirements Engineering Design Criteria & Standard Drawings (Dec 2020)	

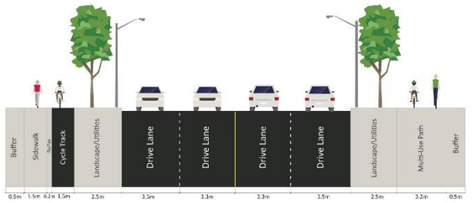
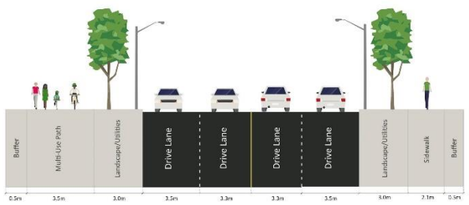
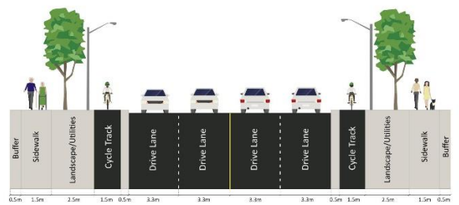
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	◑	• Pedestrians and cyclists share multi-use path of 3.2 m • MUPs are potentially less safe for pedestrians due to potential collisions with cyclists • Provision of side-by-side facility of 3.2 m which may reduce collisions and enhance safety	◑	• Pedestrians and cyclists share a multi-use path of 3.5 m on one side which is less safe for pedestrians due to potential collisions with cyclists, however, wide MUP provides opportunities to implement enhanced safety features but will not off-set increased conflicts of two-way cyclists • Two-way cyclists must share the same MUP with pedestrians, which can result in more conflicts compared to MA1 • 2.1 m sidewalk on other side	◑	• Pedestrians are separated on 1.5 m sidewalks • Bike lane is 1.5 m with a buffer of 0.5 m	
	Sub-Category Assessment		◑		◔		◕	From an active transportation perspective, **Alternatives C2-MA3** is preferred for the following reasons: • Provides minimum required sidewalk/bike lane widths which meet City of Vaughan requirements Engineering Design Criteria & Standard Drawings (Dec 2020)
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing the bike lanes	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing the bike lanes	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing the bike lanes	
	Sub-Category Assessment		●		●		●	From a road capacity perspective, **All Alternatives** are preferred equally for the following reasons: • All alternatives provide sufficient road capacity for projected traffic needs, however, any excess capacity that may be required in the future cannot be accommodated without the removal of landscape/utility area or removing active transportation facilities
Design Standard Compliance	Compliance with City and Regional design standards	●	• Meets Vaughan TMP recommended lane and facility widths and	◑	• Meets Vaughan TMP recommended lane and facility widths	◔	• Meets Vaughan TMP recommended lane and facility widths	

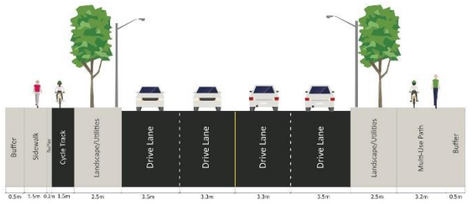
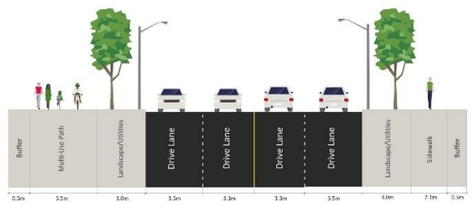
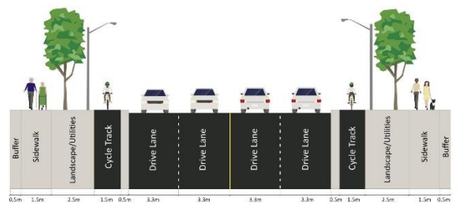
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			anticipated future required facility widths • Follow's the City of Vaughan's standard cross-section R-101		• Does not provide cycling facilities on one side of the roadway • City of Vaughan does not have a single-sided multi-use path standard cross-section • Provides 2.1 m sidewalks which meet the City's future sidewalk width requirements		• Provides 1.5 m sidewalks which does not meet the City's future sidewalk width requirements • Generally meets Vaughan's standard cross-section R-101 • City of Vaughan does not have a uni-directional cycle track standard cross-section • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Road widths cannot accommodate transit	
	Meets accessibility standards (AODA)	◕	• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.2 m multi-use path is provided for pedestrians and cyclists	◕	• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.5 m multi-use path is provided for pedestrians and cyclists on one side • 2.1 m sidewalks are provided which meet the City's desired 2.0 m sidewalk width for intensification areas	◕	• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.5 m sidewalk is provided which meets AODA's minimum requirements	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)	◕	• MUP/side-by-side facilities and landscaped area could be used to accommodate future design	◑	• MUP/sidewalk and landscaped area could be used to accommodate future design • One sided MUP and lack of a cycling facility on the other side may be more challenging to accommodate future designs / adjacent studies	◕	• Cycle track and landscaped area could be used to accommodate future design	
	Sub-Category Assessment	◕		◑		◑		From a design standard compliance perspective, **Alternatives C2-MA1** was preferred for the following reasons: • Meets Vaughan TMP recommended lane and facility widths and anticipated future required facility widths • Follow's the City of Vaughan's standard cross-section R-101

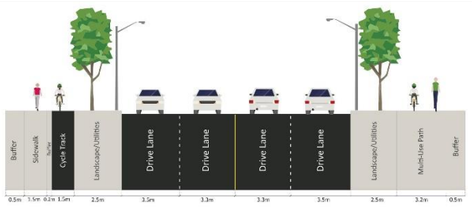
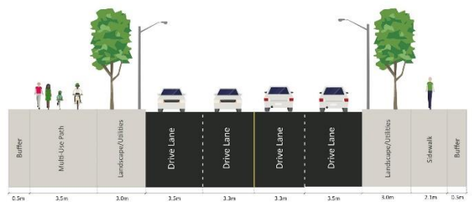
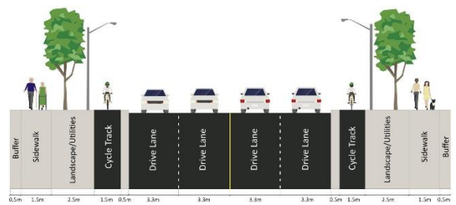
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
Community Connectivity	Provides enhanced connections to major destinations for all modes	◕	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • MUP provide flexibility to connect with other cycle facilities on connecting roadways	◑	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • Does not provide connection for cyclists on one side of the road	◕	• Provides enhanced connections for vehicles, pedestrians, and cyclists to reach major destinations • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways • Road widths cannot accommodate transit	
	Sub-Category Assessment		◕		◑		◕	From a community connectivity perspective, **Alternatives C2-MA1** was preferred for the following reasons: • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	●	• Alternative provides shared pedestrian and cyclist facilities • Side-by-side facilities/MUPs provide flexibility to connect with other cycle facilities on connecting roadways	◑	• Alternative provides shared pedestrian and cyclist facilities • Does not provide cycling facilities on one side of the road and the lack of connection may be disruptive to cyclists and require a detour • MUP provide flexibility to connect with other cycle facilities on connecting roadways	●	• Alternatives provides separate facilities for pedestrians and cyclists • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Cyclists and pedestrians could be separated via a side-by-side facility which decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	◑	• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Cyclists and pedestrians could be separated with decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	◕	• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	
	Allows for streetscape / street furniture to enhance user experience	◕	• Wide landscape features provide opportunities for street furniture	◕	• Wide landscape features provide opportunities for street furniture	◕	• Wide landscape features provide opportunities for street furniture	

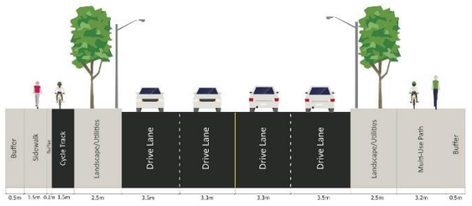
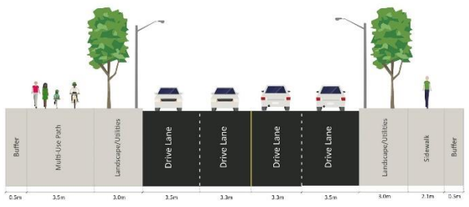
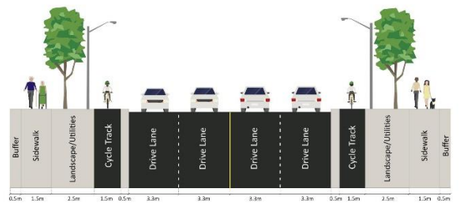
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Sub-Category Assessment							From a quality and sustainable public realm perspective, **Alternatives C2-MA1 and C2-MA3** are equally preferred for the following reasons: • Both alternatives have the ability to provide separated pedestrian and cyclist facilities which provide flexibility to connect with other cycle facilities on connecting roadways • Roadway and active transportation facilities supports an accessible network for all ages and abilities • Wide landscape features provide opportunities for street furniture
Overall Category Ranking								**Alternative C2-MA1** is the preferred cross-sections from an overall Transportation perspective for the following reasons: • Achieve complete street principles and provides adequate infrastructure for all road users • Pedestrians and cyclists are separated from vehicular traffic • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block and supports Block 27 as a transit-oriented community • Provides flexibility to connect with other cycle facilities on connecting roadways • Provides wider facility widths which meet the City's anticipated future required facility widths
Socio-Economic Environment								
Supports Surrounding Land-Uses	Conforms with land-use policy objectives		 • Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space		 • Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space		 • Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Generally conforms to policy objectives of encouraging active transportation by providing for a	

Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4). • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)		for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4). • Opportunity to accommodate bus service (VOP 4.2.1.24) • Does not align with City's Pedestrian and Bicycle Master Plan (Dec 2020) because cycling facility are not provided on both sides of the road which is a requirement for major collector roads per the Master Plan		dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a vertically separated bike lane (Growth Plan 3.2.3.4). • Does not accommodate bus service and is not transit supportive which is an objective in the VOP (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan) • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan	
	Supports surrounding land-uses	◑	• Dedicated cycling facilities buffered via landscaping supports land uses and built forms by encourages safe, active modes of transportation to access mixed use areas • Allow cyclists to access both sides of the roadway • Side-by-side facilities/MUPs provide less favourable condition compared to Alternative C2-MA3 (separated uni-directional cycle tracks) given mid-rise residential uses and presence of driveways east of the railway	◔	• The multi-use path helps to encourage active forms of transportation to support mixed use areas along one side of Collector Road 2 • The lack of cycling facilities on one side of the street decreases the convenience, comfort and ease of use for cyclists accessing both the north and south mixed-use areas along Collector Street 2 as it will either require additional maneuvering through intersections to turnaround or require cyclists to cycle on-street • MUPs provide less favourable condition compared to Alternative C2-MA3 (separated uni-directional cycle tracks) given mid-rise residential uses east of the railway,	◔	• Raised and buffered cycle tracks will encourage active forms of transportation to support mixed use areas along Collector Road 2 • Uni-directional cycle tracks allow cyclists to access both sides of the roadway • Uni-directional cycling facilities are favourable given mid-rise residential uses and presence of driveway east of the railway • Does not support transit to support the transit orientated community	

Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
					however, the reduction of MUP to one side of street is more supportive of the surrounding residential uses (reduces the number of conflicts between vehicles and users of the MUP than if the MUP was provided on both sides of the street – i.e., C5-MA1)			
	Encourages aesthetic and adheres to urban design principles		• Provides for street trees which improves aesthetics • High amount of pavement dedicated to vehicle lanes which reduces the aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics		• Provides for street trees which improves aesthetics • Lowest amount of continuous pavement which improves aesthetics and increases opportunity for more landscaping • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics		• Provides for street trees which improves aesthetics • High continuous amount of pavement which decreases aesthetics	
	Sub-Category Assessment							**Alternative C2-M1** is preferred from a land-use policy compliance perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics
Climate Change	Ability to address climate change		• Moderate imperviousness, moderate chance to address climate change		• Moderate imperviousness, moderate chance to address climate change		• Moderate imperviousness, moderate chance to address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.

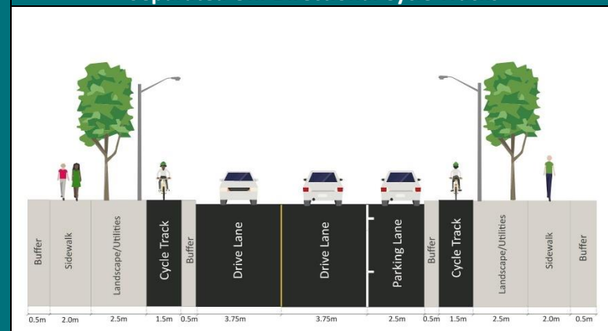
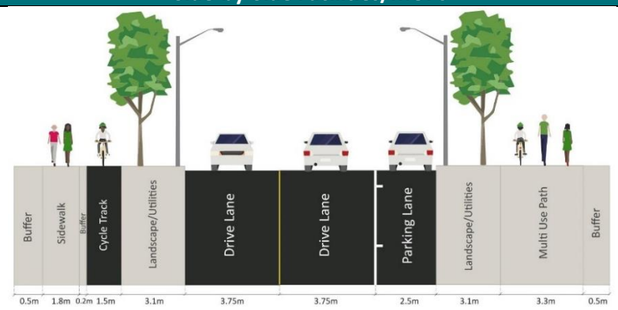
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Sub-Category Assessment		◑		◑		◑	**All Alternatives** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
	Overall Category Ranking		◕		◑		◔	**Alternative C2-MA1** is preferred from an overall socio-economic environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
Cost & Constructability								
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction		• Construction of roadway with MUP is standard and construction is not anticipated to be complex • Second largest boulevard width which will provide increased feasibility for LIDs		• Construction of MUP and sidewalks are standard and construction is not anticipated to be complex • LID can be easily implemented within the landscape area adjacent to the pavement • More room for utilities		• Construction of roadway in boulevard raised and buffered cycle tracks is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the cycle tracks complicates the implementation of LIDs as they obstruct/ interfere with the potential connection of catch basins to LIDs underneath the landscape area	

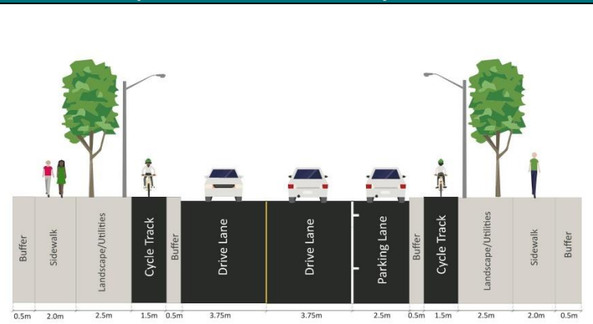
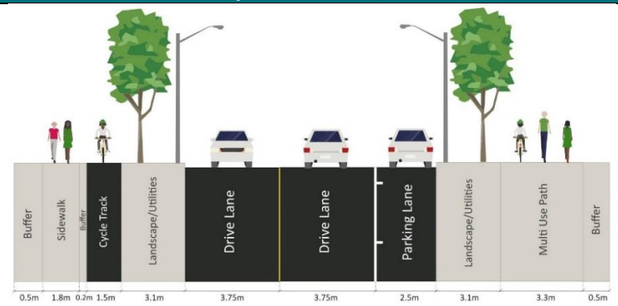
Evaluation Criteria		Alternative C2 – MA1 Side By Side Facilities/MUPs		Alternative C2 – MA2 Multi-Use Path (single sided)		Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Scale of Capital Costs		• Construction costs for the road are anticipated to be similar		• Construction costs for the road are anticipated to be similar		• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs		• Operating and maintenance costs are anticipated to be similar		• Operating and maintenance costs are anticipated to be similar		• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking								**All Alternatives** are equally preferred from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facilities / MUP / side-by-side facilities are standard within the City of Vaughan and construction is not anticipated to be complex • Capital, operational, and maintenance costs are anticipated to be similar
OVERALL EVALUATION								**Alternative C2-MA1 was identified as preferred cross-section for Street 2 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users and meet the City's design standards • Pedestrians and cyclists are separated from vehicular traffic • Road width accommodates transit vehicles • Provides flexibility to connect with other cycle facilities on connecting roadways • Provides wider facility widths which meet the City's anticipated future required facility widths • Conforms with City of Vaughan land-use policy objectives, providing both active transportation and transit supportive infrastructure • Provides active transportation facilities on both side of the road to provide access to the low-rise mixed-uses on both sides of the road • Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change

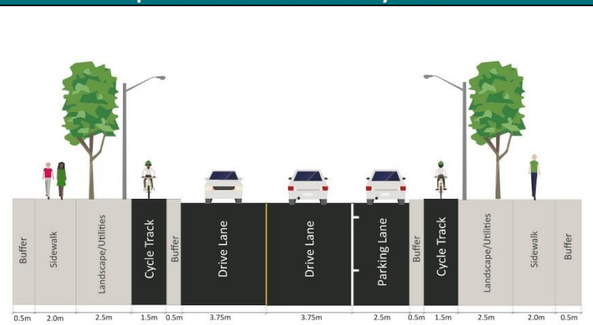
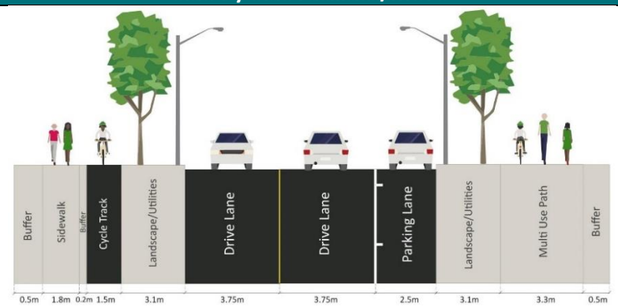
Evaluation Criteria	Alternative C2 – MA1 Side By Side Facilities/MUPs	Alternative C2 – MA2 Multi-Use Path (single sided)	Alternative C2 – MA3 Separated Uni-Directional Cycle Tracks	Comments / Rationale
	 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)			• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change

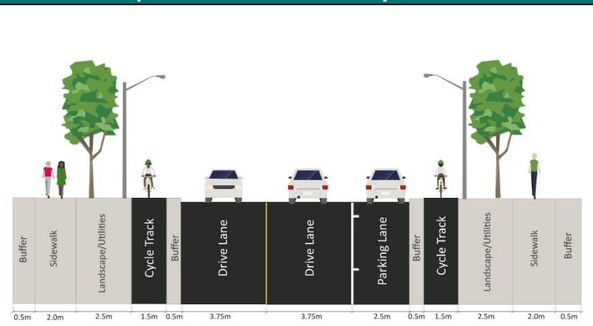
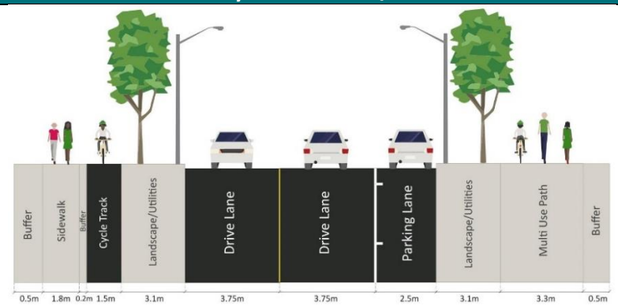
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 3 – Minor Collector)

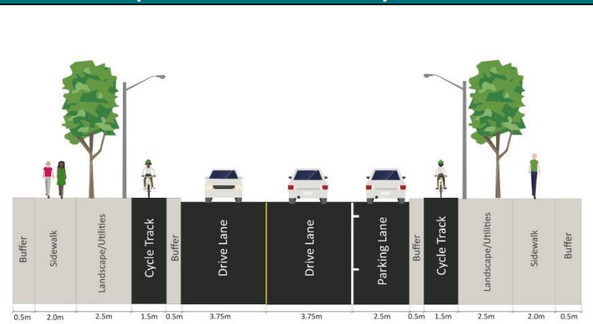
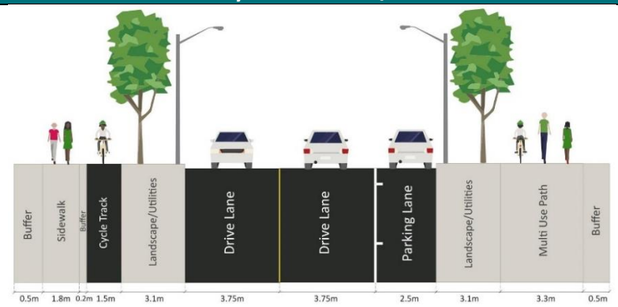
Legend: ○ Least Benefits / Most Impacts → ◔ ◑ ◕ ● Most Benefits / Least Impacts

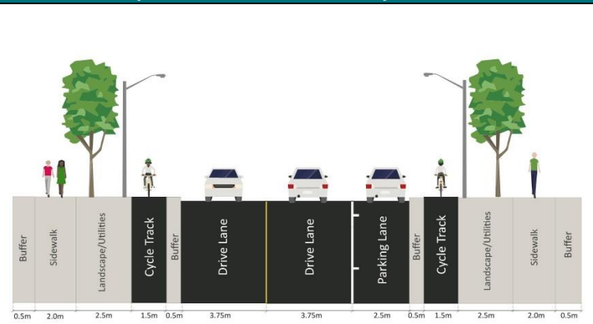
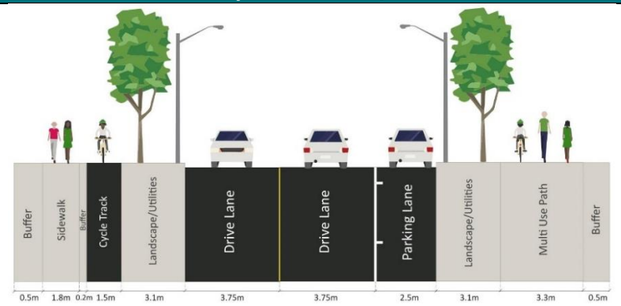
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Transportation						
AT Road Safety	Achieves complete street principles	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Increased perceived cyclist comfort and safety will encourage users of schools, parks and mixed-use areas	
	Pedestrian/cyclist safety **Note**: Collector Street 3 is along a mix of low rise residential as well as stormwater management (SWM) ponds and schools	◕	• Provides safer conditions given the surrounding low-rise residential and low-rise mixed-use land-uses adjacent to Collector Street 3 (high number of driveways and requires drivers to only need to look for cyclists and cars at one location) • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	◑	• Provides less favourable conditions compared to Alternative C3-MI1 (uni-directional cycle track) due to the surrounding low-rise residential and low-rise mixed-use land-uses adjacent to Collector Street 3 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	
	Achieves Vision Zero objectives	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	
	Sub-Category Assessment		●		◕	**Alternative C3-MI1** is preferred from an active transportation road safety perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the low-rise mixed and residential uses along Collector Road 3 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety

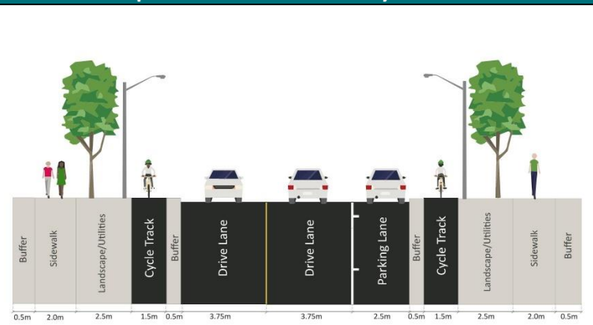
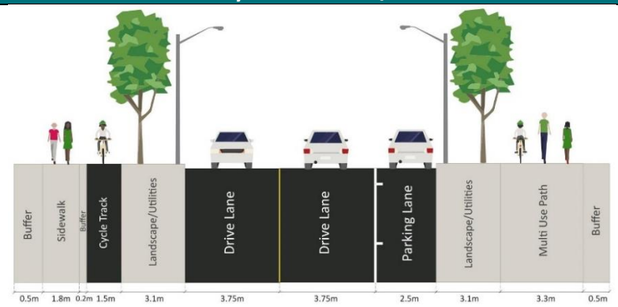
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities			
Transit Serviceability	Accommodates future transit infrastructure		• Roadway can accommodate future transit route		• Roadway can accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)		• Ability to convert the parking lane, bike lane, or wide landscape/utilities into a lane to adapt to changing options in transit service provision		• Ability to convert the parking lane, bike lane, or landscape/utilities into a lane to adapt to changing options in transit service provision	
	Sub-Category Assessment					**Alternatives C3-M1** and **C3-M2** are preferred equally from a transit serviceability perspective for the following reasons: • Both alternatives can accommodate future transit infrastructure • Both alternatives have the ability to convert the parking lane, bike lane, or landscape / utilities into a lane to adapt to changing options in transit service provision
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities		• Provides 2.0 m sidewalks and minimal bike lane width of 1.5 m which meet City standards for AT facilities		• Provides 1.8 m sidewalks/1.5 m bike lanes or 3.3 m MUP which meet City standards for AT facilities	
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users		• Pedestrians are separated by a 2.5 m landscape / utilities buffer which enhances safety and provides opportunities to implement safety features • Cyclists have a 0.5 m buffer from travel lane in each direction		• Pedestrians and cyclists are off-street and separated by a 3.1 m landscape / utilities buffer from travel lanes which enhances safety and provides opportunities to implement safety features	
	Sub-Category Assessment					**Alternatives C3-MI1 and C3-MI2** are equally preferred from an active transportation perspective for the following reasons: • Both alternatives provide required sidewalk and cycle track facility widths • Both alternatives have wide landscape and utility facility / buffers which enhances safety and provides opportunities to implement safety features
Road Capacity	Provide sufficient road capacity for the projected traffic needs		• Two travel lanes provide sufficient road capacity for projected traffic needs		• Two travel lanes provide sufficient road capacity for projected traffic needs	

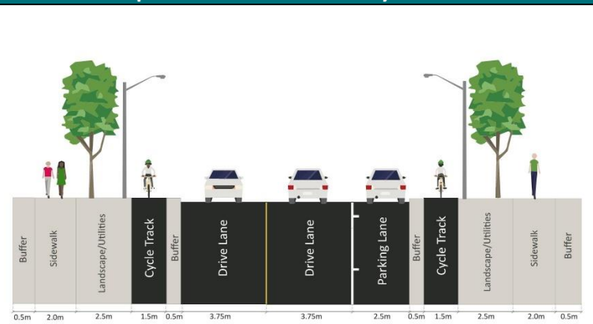
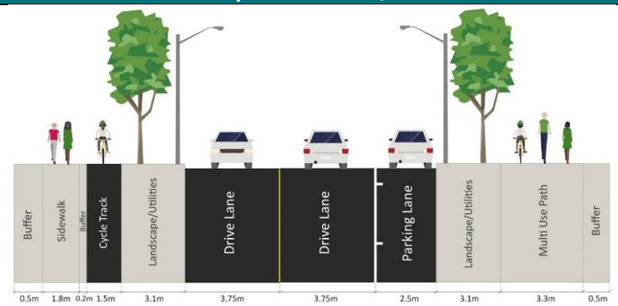
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment					**Alternatives C3-MI1 and C3-MI2** are preferred equally from a road capacity perspective for the following reasons: • Both alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards		• Sidewalk and bike lane widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • City requires the provision of cycle tracks on both sides of collector roads, and prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road, and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.		• MUP / side-by-side facility widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.8 m sidewalk is provided which exceeds AODA's 1.5 m requirement		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.3 m multi-use path or 3.5 m side-by-side facilities are provided for pedestrians and cyclists	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
	Sub-Category Assessment					**Alternative C3-MI1 and C3-MI2** are preferred equally from a design standard compliance perspective following reasons: • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Parking lane, landscaped area and bike lanes could be used to accommodate future designs

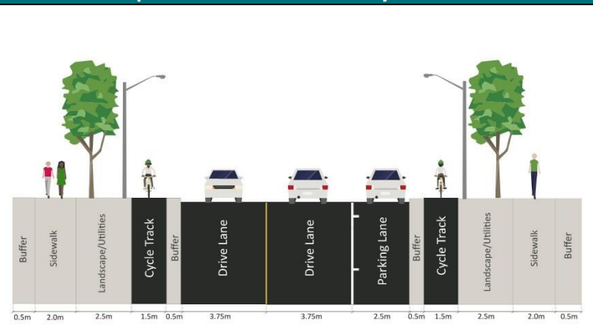
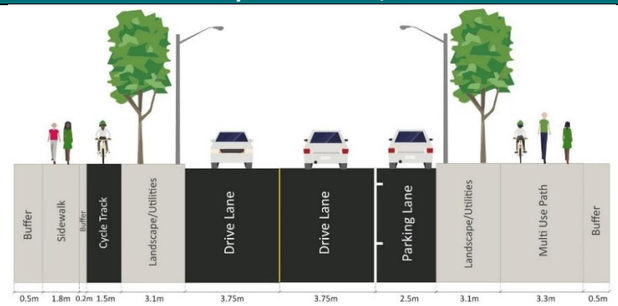
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Community Connectivity	Provides enhanced connections to major destinations for all modes	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	
	Sub-Category Assessment		●		●	**Alternatives C3-MI1 and C3-MI2** are preferred equally from a community connectivity perspective for the following reasons: • Both alternatives provide enhanced connections for vehicles, pedestrians and cyclists to reach major destinations
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	●	• Alternative provides separated pedestrian and cycling pathways • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	●	• Alternative provides multi use pathways for both pedestrians and cyclists • MUP/side-by-side facilities provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Cycle track results in a greater distance for pedestrians to cross the street (less comfortable, but safe) • Cycle tracks are separated from travel/parking lane by a 0.5 m buffer	◑	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater potential for collisions between cyclists and pedestrians since cycling facilities are mixed/next to the sidewalk which may not be preferred by children or seniors • Off-street cycling facilities results in a shorter distance for pedestrians to cross the street (increased comfort)	
	Allows for streetscape / street furniture to enhance user experience	●	• Wide landscape buffer provides opportunities for street furniture / streetscape	●	• Wide landscape buffer provides opportunities for street furniture / streetscape	
	Sub-Category Assessment		◕		◕	**Alternative C3-MI1** is preferred from a quality and sustainable public realm perspective for the following reasons: • Alternative provides pedestrian and cycling facilities with a wide buffer which minimizes risk for collisions and may be preferred for children and seniors

Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways
Overall Category Ranking						**Alternative C3-MI1** is the preferred cross-section Street 3 from a Transportation perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the low-rise mixed and residential uses along Collector Road 3 • Separated buffered pedestrian and cyclist facilities • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities • Alternative provides greater separation between pedestrian and cycling facilities which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways
Socio-Economic Environment						
Supports Surrounding Land-Uses	Conforms with land-use policy objectives		• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3)		• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3)	

Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Conforms to policy objectives by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan) • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan		• Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses	●	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses	◕	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • MUPs provides less favourable conditions compared to Alternative C1-MI1 (uni-directional cycle track) due to the surrounding residential land-uses	
	Encourages aesthetic and adheres to urban design principles	◕	• Provides a large landscape width for street trees which improves aesthetics • Moderate amount of continuous pavement without buffer which decreases aesthetics	◕	• Provides a large landscape width for street trees which improves aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which improves aesthetics	
	Sub-Category Assessment	●		◕		**Alternatives C3-MI1** is preferred from a land-use perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses

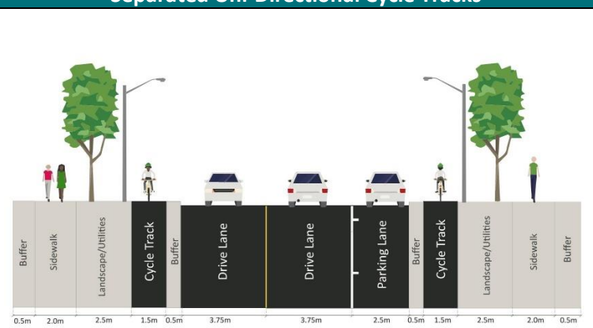
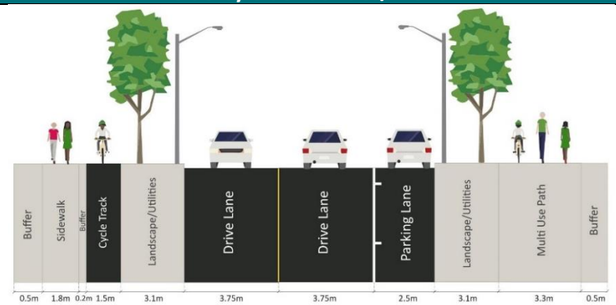
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
					 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
					• Provides a moderate to large landscaping area which improves aesthetics	
Climate Change	Ability to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width to implement LID and tree canopy which will increase evapotranspiration to help address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives	◑	• Moderate imperviousness expected for this cross section • The placement of the bike lane and/ parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area • Moderate boulevard width will provide some opportunities for LIDs	◑	• Moderate imperviousness expected for this cross section • Due to the parking lane, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Sub-Category Assessment		◑		◑	**Alternatives C1-MI1 and C1-MI2** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change LID can be easily implemented within the landscape area adjacent to the pavement • Moderate imperviousness expected for this cross section • Due to the parking/cycle track, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs
Overall Category Ranking			◕		◑	**Alternative C3-MI1** is the preferred cross-sections from a Socio-Economic environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives

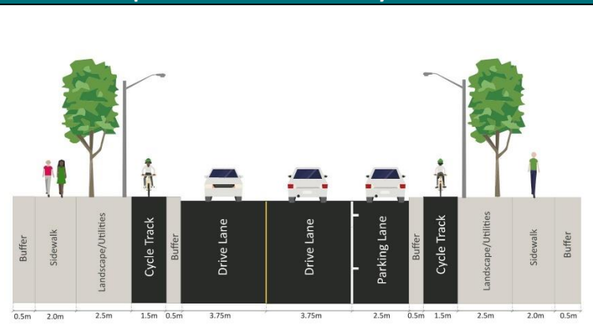
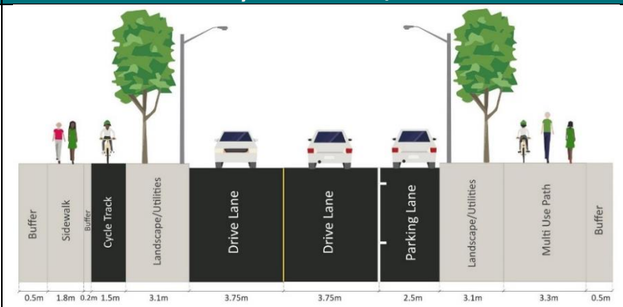
Evaluation Criteria		Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C3 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycle facilities are more favorable given the surrounding residential land-uses • Provides a large landscape width for street trees which improves aesthetics • Moderate imperviousness with moderate ability to address climate change
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction	◕	• Construction of roadway with on-street uni-directional bike lanes is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	◕	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	
	Scale of Capital Costs	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking		◑		◑		**Alternatives C3-MI1 and C3-MI2 are** preferred equally from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facility or MUP/side-by-side facilities are standard within the City of Vaughan and complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar

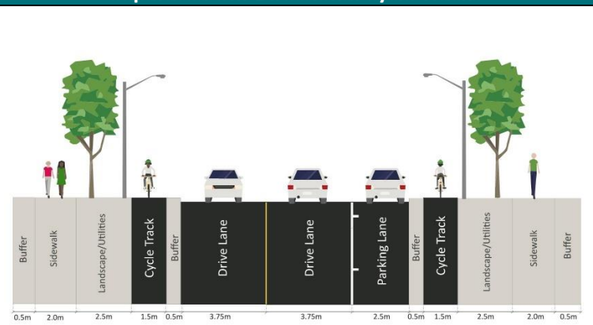
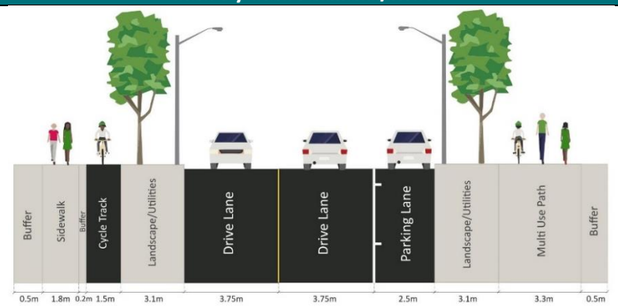
Evaluation Criteria	Alternative C3 – MI1 Separated Uni-Directional Cycle Tracks	Alternative C3 – MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
OVERALL EVALUATION			**Alternative C3-MI1 is the preferred cross-sections for Street 3 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the low-rise mixed and residential uses along Collector Road 3 since it requires drivers to only need to look for cyclists and cars at one location • Separated buffered pedestrian and cyclist facilities • Alternative provides separated pedestrian and cycling pathways which minimizes risk for collisions and may be preferred for children and seniors • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycle tracks better supports the surrounding low-rise residential uses and low-rise mixed-use land-uses adjacent to Collector Street 3 so that drivers going in/out of drivers only need to look at 1 location for on-coming cyclists / vehicles • Provides a moderate landscape width for street trees (2.5 m landscape/utilities width) which improves aesthetics and moderately addresses climate change

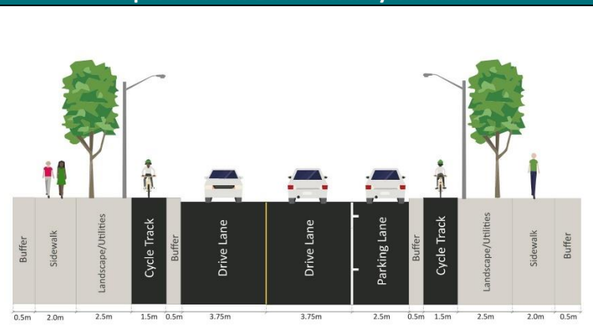
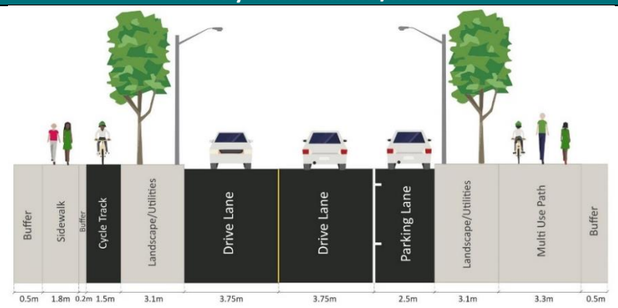
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 4 – Minor Collector)

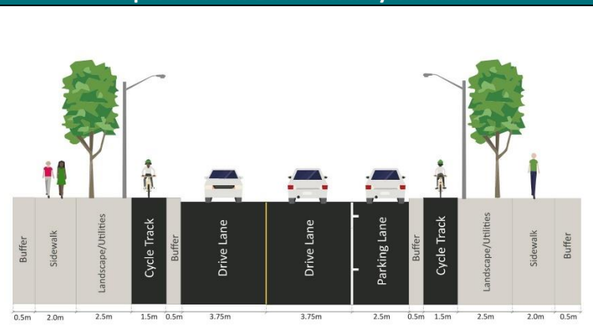
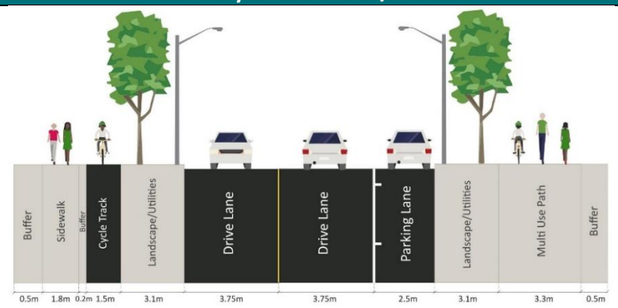
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

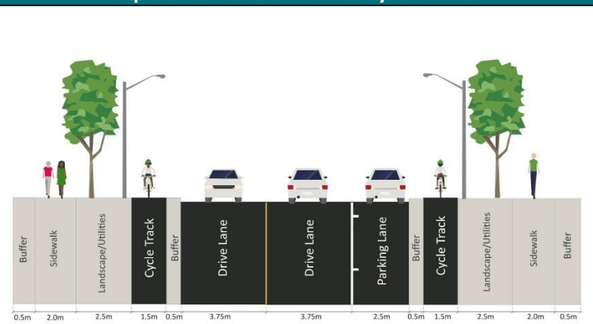
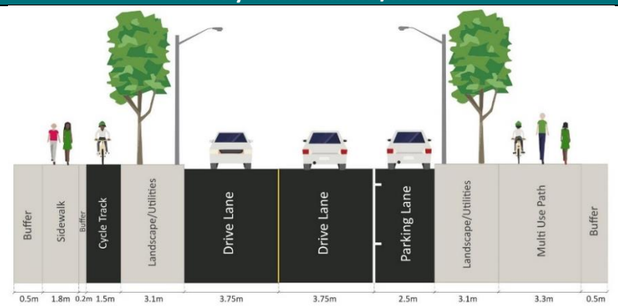
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Transportation						
AT Road Safety	Achieves complete street principles	◕	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Decreased perception of safety given presence of driveways and opportunities for conflicts which could discourage active modes of transportation	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Increased perceived bicycle comfort and safety will encourage users of schools, parks and mixed-use areas	
	Considers pedestrian/cyclist safety Note: Collector Street 4 is along low-rise mixed-use	●	• Provides safer conditions given the majority of the surrounding land-use along both sides of Collector Street 4 are low-rise mixed-use and a few low-rise residential land-uses • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	◕	• Provides less favourable conditions compared to Alternative C4-MI1 (uni-directional cycle track) given the majority of the surrounding land-use along both sides of Collector Street 4 are low-rise mixed-use and a few low-rise residential land-uses • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	
	Achieves Vision Zero objectives	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	
	Sub-Category Assessment	●		◕		**Alternative C4-MI1** is preferred from an active transportation road safety perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the surrounding low-rise residential uses and low-rise mixed-use land-uses adjacent to Collector Street 4

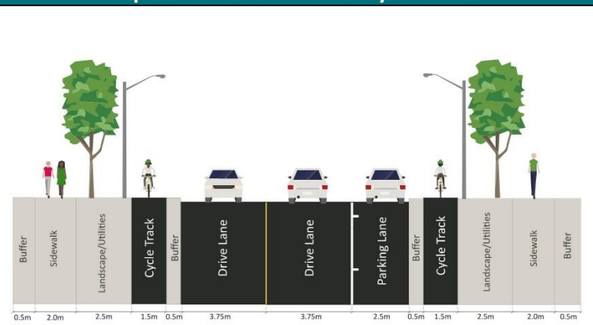
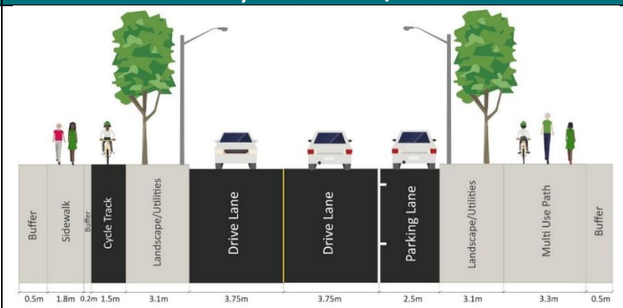
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
					 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Provides off-street separated facilities for both pedestrians and cyclists which enhances safety • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities
Transit Serviceability	Accommodates future transit infrastructure	◑	• Street has not been identified to accommodate future transit infrastructure	◑	• Street has not been identified to accommodate future transit infrastructure	• Street has not been identified to accommodate future transit infrastructure, as such a neutral rating has been given
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Limited need to implement alternative adaptable options for changing options in transit service provisions given the street is not suitable to be a transit route	◑	• Limited need to implement alternative adaptable options for changing options in transit service provisions given the street is not suitable to be a transit route	• Street has not been identified to accommodate future transit infrastructure, as such a neutral rating has been given
	Sub-Category Assessment	◑		◑		**Alternatives C4-M1** and **C4-M2** are preferred equally from a transit serviceability perspective for the following reasons: • Both alternatives can accommodate future transit infrastructure, however has not been identified as a future transit route and has been assigned a neutral rating • Both alternatives have limited need to implement alternative adaptable options for changing options in transit service provisions given the street is not suitable to be a transit route
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	●	• Provides 2.0 m sidewalks and minimal bike lane width of 1.5 m which meet City standards for AT facilities	●	• Provides 1.8 m sidewalks/1.5 m bike lanes or 3.3 m MUP which meet City standards for AT facilities	
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	●	• Pedestrians are separated by a 2.5 m landscape / utilities buffer which enhances safety and provides opportunities to implement safety features • Cyclists have a 0.5 m buffer from travel lane in each direction	●	• Pedestrians and cyclists are off-street and separated by a 3.1 m landscape / utilities buffer from travel lanes which enhances safety and provides opportunities to implement safety features	
	Sub-Category Assessment	●		●		**Alternatives C4-MI1 and C4-MI2** are equally preferred from an active transportation perspective for the following reasons: • Both alternatives provide required sidewalk and cycle track facility widths

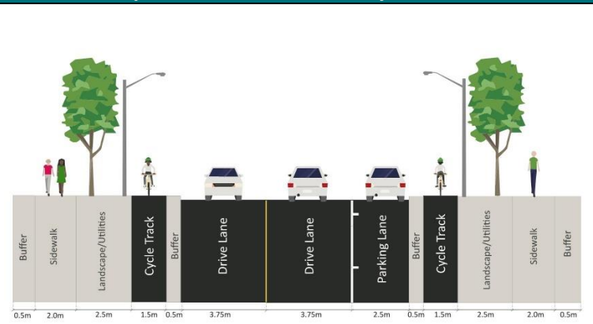
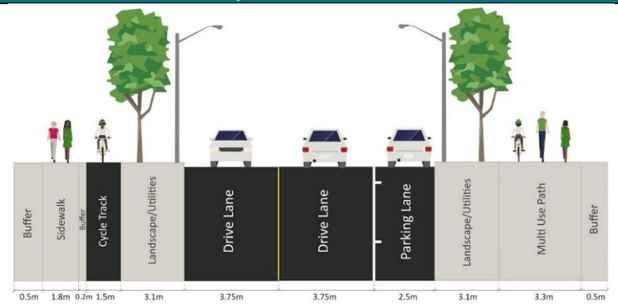
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Both alternatives have wide landscape and utility facility / buffers which enhances safety and provides opportunities to implement safety features
Road Capacity	Provide sufficient road capacity for the projected traffic needs		• Two travel lanes provide sufficient road capacity for projected traffic needs		• Two travel lanes provide sufficient road capacity for projected traffic needs	
	Sub-Category Assessment					**Alternatives C4-MI1 and C4-MI2** are preferred equally from a road capacity perspective for the following reasons: • Both alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards		• Sidewalk and bike lane widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • City requires the provision of cycle tracks on both sides of collector roads, and prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road, and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.		• MUP / side-by-side facility widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.8 m sidewalk is provided which exceeds AODA's 1.5 m requirement		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.3 m multi-use path or 3.5 m side-by-side facilities are provided for pedestrians and cyclists	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
	Sub-Category Assessment					**Alternative C4-MI1 and C4-MI2** are preferred equally from a design standard compliance perspective following reasons:

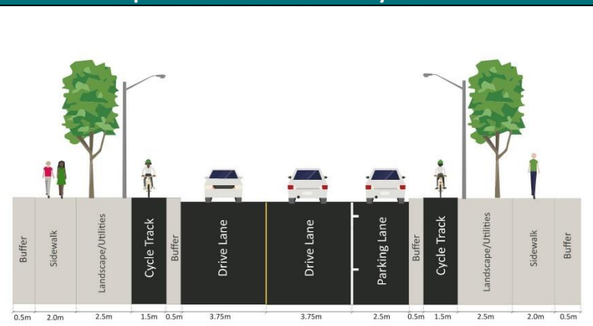
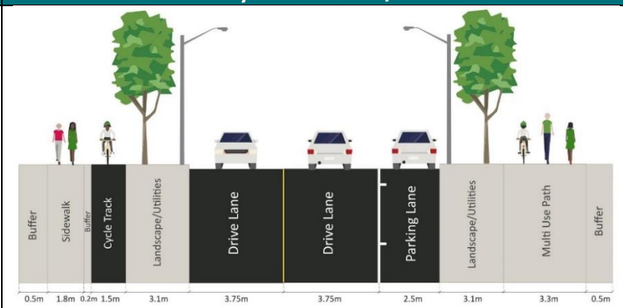
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
					 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
					• Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
Community Connectivity	Provides enhanced connections to major destinations for all modes	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	
	Sub-Category Assessment		●		●	**Alternative C4-MI1 and C4-MI2** are preferred equally from a community connectivity perspective for the following reasons: • Both alternatives provide enhanced connections for vehicles, pedestrians and cyclists to reach major destinations
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	●	• Alternative provides separated pedestrian and cycling pathways • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	●	• Alternative provides multi use pathways for both pedestrians and cyclists • MUP/side-by-side facilities provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Cycle tracks results in a greater distance for pedestrians to cross the street (less comfortable, but safe) • Cycle tracks are separated from travel/parking lane by a 0.5 m buffer	◑	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater potential for collisions between cyclists and pedestrians since cycling facilities are mixed/next to the sidewalk which may not be preferred by children or seniors • Off-street cycling facilities results in a shorter distance for pedestrians to cross the street (increased comfort)	
	Allows for streetscape / street furniture to enhance user experience	●	• 2.5 m landscape buffer provides opportunities for street furniture / streetscape	●	• 3.1 m landscape buffer provides opportunities for street furniture / streetscape	

Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment		●		◕	**Alternative C4-MI1** is preferred from a quality and sustainable public realm perspective for the following reasons: • Alternative provides pedestrian and cycling facilities with a wide buffer which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Wide landscape buffer provides opportunities for street furniture / streetscape
Overall Category Ranking			◕		◑	**Alternative C4-MI1** is preferred from an overall Transportation perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the low-rise mixed-use and low-rise residential land-uses along Collector Road 4 • Separated buffered pedestrian and cyclist facilities • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities • Alternative provides greater separation between pedestrian and cycling facilities which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways

Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Socio-Economic Environment						
Supports Surrounding Land-Uses	Conforms with land-use policy objectives	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan) • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses	●	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding low-rise residential and low-rise mixed-uses land-uses	◕	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • MUPs are less favourable compared to uni-directional cycle tracks given the surrounding low-rise residential and low-rise mixed-use land-uses	
	Encourages aesthetic and adheres to urban design principles	◕	• Provides a large landscape width for street trees which improves aesthetics • Moderate amount of continuous pavement without buffer which decreases aesthetics	◕	• Provides a large landscape width for street trees which improves aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which improves aesthetics	
	Sub-Category Assessment		●		◕	**Alternatives C4-MI1** is preferred from a land-use perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives

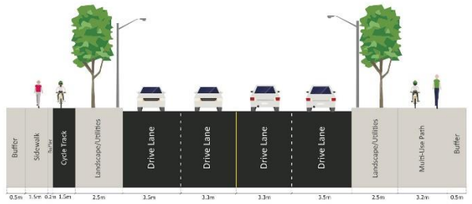
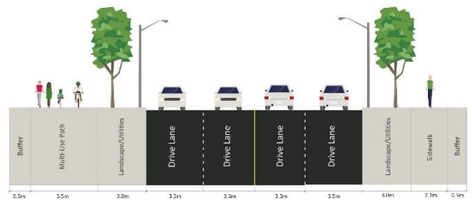
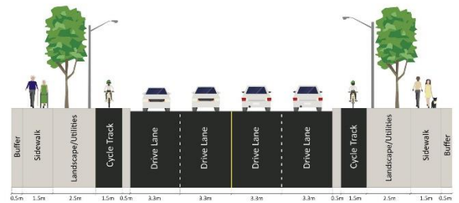
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding low-rise residential and low-rise mixed-uses land-uses • Provides large landscaping area which improves aesthetics
Climate Change	Ability to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width to implement LID and tree canopy which will increase evapotranspiration to help address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives	◑	• Moderate imperviousness expected for this cross section • The placement of the bike lane and/ parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area • Moderate boulevard width will provide some opportunities for LIDs	◑	• Moderate imperviousness expected for this cross section • Due to the parking lane, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Sub-Category Assessment	◑		◑		**Alternatives C4-MI1 and C4-MI2** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change LID can be easily implemented within the landscape area adjacent to the pavement • Moderate imperviousness expected for this cross section • Moderate boulevard will provide some opportunities for LIDs

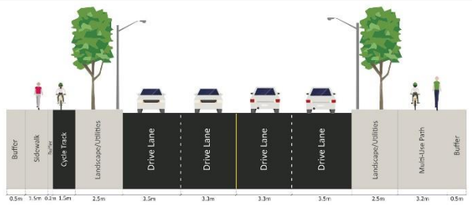
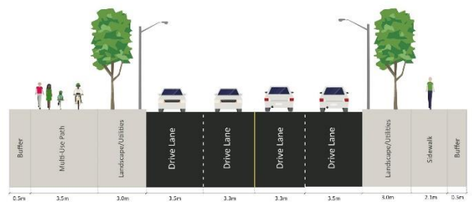
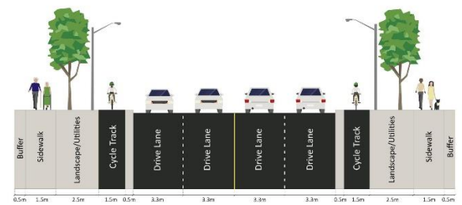
Evaluation Criteria		Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C4 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Overall Category Ranking			◔		◑	**Alternative C4-MI1** is the preferred cross-section from a Socio-Economic environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding low-rise residential and low-rise mixed-uses land-uses • Provides large landscaping area which improves aesthetics
Cost & Constructability						
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction	◔	• Construction of roadway with on-street uni-directional bike lanes is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	◔	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	
	Scale of capital costs	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking			◑		◑	**Alternatives C4-MI1 and C4-MI2** are equally preferred cross-sections from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facility or MUP/side-by-side facilities are standard within the City of Vaughan and complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar

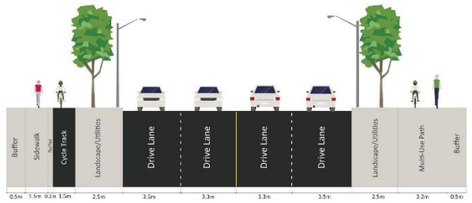
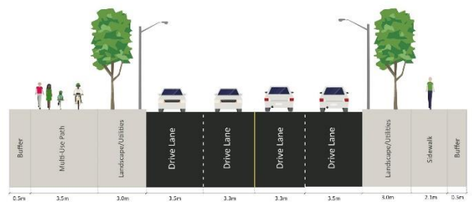
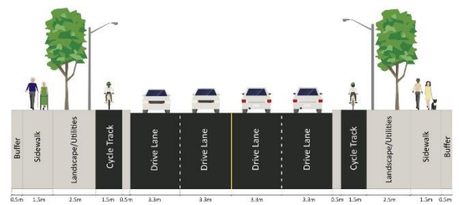
Evaluation Criteria	Alternative C4 – MI1 Separated Uni-Directional Cycle Tracks	Alternative C4 – MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
OVERALL EVALUATION	◕	◑	**Alternatives C4-MI1 is the preferred cross-sections for Street 4 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safe conditions given the surrounding low-rise mixed and residential land-uses along Collector Road 4 • Separated pedestrian and cyclist facilities are provided • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Provides large landscaping area which improves aesthetics

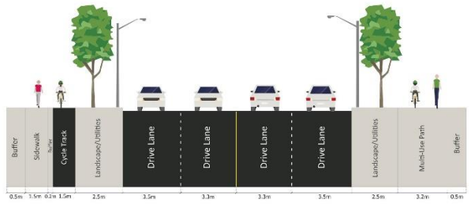
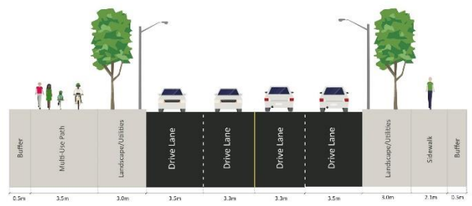
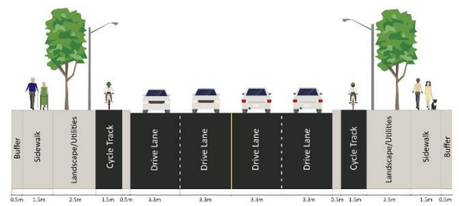
Alternative Evaluation Table: Road Alignment Cross Sections (Street 5 – Major Collector)

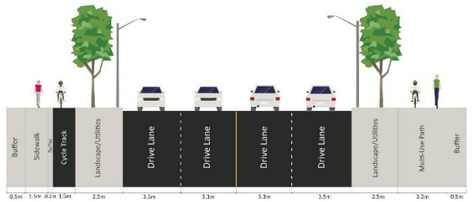
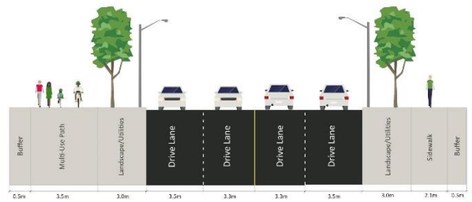
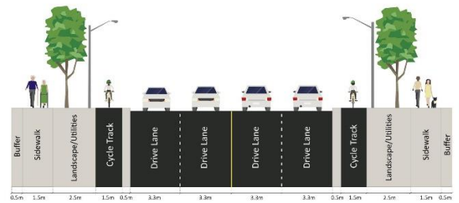
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

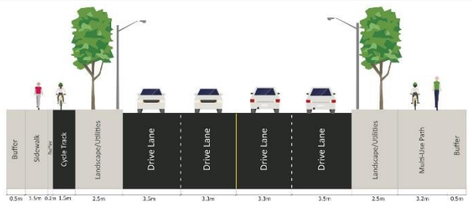
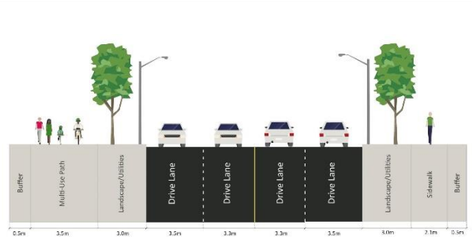
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
Transportation								
Active Transportation Road Safety	Achieves complete street principles	◕	• Achieves complete street principles • Provides adequate infrastructure for all roadway users	◑	• Achieves complete street principles (partial) • No cycling infrastructure on one side of road	◕	• Achieves complete street principles • Provides adequate infrastructure for all road users • Decreased perception of bicycle safety given proximity of bicycle lane to vehicle lanes which offers less support for community hub and GO Station to be accessed via bicycle	
	Considers pedestrian/cyclist safety (Note: Collector Street 5 is along low-rise residential land-uses, schools, and the community hub)	◔	• Provides poor safety conditions given there are low-rise and mid-rise residential land-uses along Collector Road 5 • Shared multi-use path for both pedestrians and cyclists outside of the travel lanes may result in collisions • Pedestrian facilities placed side by side with cycling facilities may help reduce collisions between pedestrians and cyclists	◔	• Provides poor safety conditions given there are low-rise residential, and school uses along Collector Road 5, however, the reduction of MUP to one side of street increases safety • Wide 3.5 m multi-use pathway for pedestrians and cyclists and 2.1 m sidewalk which are located outside of the travel lanes • Pedestrian facilities mixed with cycling facilities in MUP which may result in collisions • Cycle tracks are not provided on one side of the street and will require cyclists to cycle on-street	◕	• Provides a safer condition given there are low-rise residential, and school uses along Collector Road 5 • Cycling facilities are at the minimum standard width (per the City's Engineering Design Criteria & Standard Drawings (Dec 2020) along with a buffer between cyclists and travel lane • Pedestrians and cyclists are in separated facilities which minimizes potential collisions	
	Achieves Vision Zero objectives	◕	• Separated pedestrian and cycling facilities from vehicle traffic	◔	• Separated pedestrian and cycling facilities from vehicle traffic • Cyclists will need to cycle on-street on one side of the road	◕	• Separated pedestrian and cyclist facilities	
	Sub-Category Assessment		◑		◑		◕	From an AT road safety perspective **Alternative C5-MA3** is preferred following reasons:

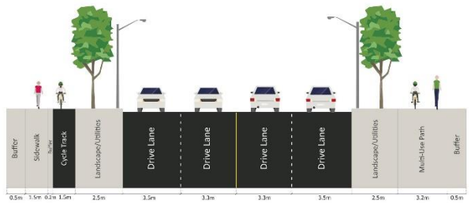
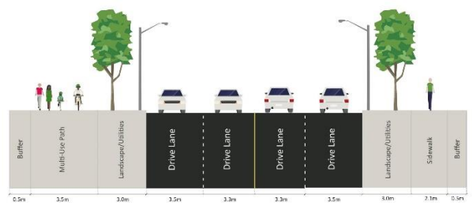
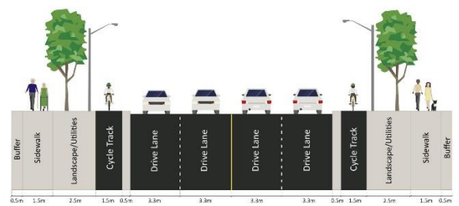
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			• Achieves complete street principles and provides sufficient infrastructure for all road users which meeting the City's required standards • Provides a safer condition given there are low-rise residential, and school uses along Collector Road 5 • Pedestrians and cyclists are in separated facilities which minimizes potential collisions					
Transit Serviceability	Accommodates future transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	○	• Roadway cannot accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision • Four-lane roadway provides flexibility to be converted to implement alternative options for changing options in transit service provision	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision • Four-lane roadway provides flexibility to be converted to implement alternative options for changing options in transit service provision	○	• Roadway cannot accommodate future transit route	
	Sub-Category Assessment	◕		◕		○		From a transit serviceability perspective, **Alternatives C5-MA1 and C5-MA2** are preferred equally for the following reasons: • Can accommodate future transit route and there are areas available to be converted into alternative options for changing option in transit service provisions
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	◑	• Provides multi-use paths or side-by-side facilities with a width of 3.2 m	◔	• Multi-use path provides shared facility for pedestrians and cyclists totalling 3.5 m • The MUP would need to be shared with two-way cyclists and pedestrians which may increase potential conflicts	◕	• Provides 1.5m cycle track width • Provides 1.5 m sidewalks • Provides minimum required sidewalk/bike lane widths which meet City of Vaughan requirements Engineering Design Criteria & Standard Drawings (Dec 2020)	

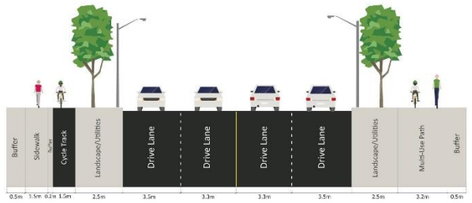
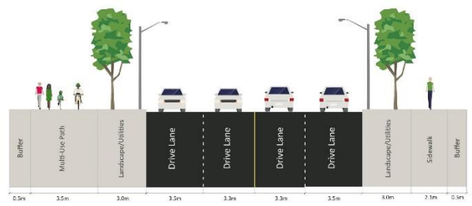
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	◑	• Pedestrians and cyclists share multi-use path of 3.2 m • MUPs are potentially less safe for pedestrians due to potential collisions with cyclists • Provision of side-by-side facility of 3.2 m which may reduce collisions and enhance safety	◑	• Pedestrians and cyclists share a multi-use path of 3.5 m on one side which is less safe for pedestrians due to potential collisions with cyclists, however, wide MUP provides opportunities to implement enhanced safety features • Two-way cyclists must share the same MUP with pedestrians, which can result in more conflicts versus MA1 • 2.1 m sidewalk on other side	◑	• Can accommodate safer intersection designs • Pedestrians are separated on sidewalks • Cycle track is 1.5 m with a buffer of 0.5 m	
	Sub-Category Assessment		◑		◔		◕	From an active transportation perspective, **Alternatives C5-MA3** is preferred for the following reasons: • Provides minimum required sidewalk/cycle track widths
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing the bike lanes	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing multi-use path	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing landscaping/utility area or removing the bike lanes	
	Sub-Category Assessment		●		●		●	From a road capacity perspective**, all Alternatives** are preferred equally for the following reasons: • All alternatives provide sufficient road capacity for projected traffic needs, however, any excess capacity that may be required in the future cannot be accommodated without the removal of landscape/utility area or removing active transportation facilities
Design Standard Compliance	Compliance with City and Regional design standards	●	• Meets Vaughan TMP recommended lane and facility widths and anticipated future required facility widths • Follow's the City of Vaughan's standard cross-section R-101	◑	• Meets Vaughan TMP recommended lane and facility widths • Does not provide cycling facilities on one side of the roadway • City of Vaughan does not have a single-sided multi-use path standard cross-section	◔	• Meets Vaughan TMP recommended lane and facility widths • Provides 1.5 m sidewalks which does not meet the City's future sidewalk width requirements • Generally meets Vaughan's standard cross-section R-101	

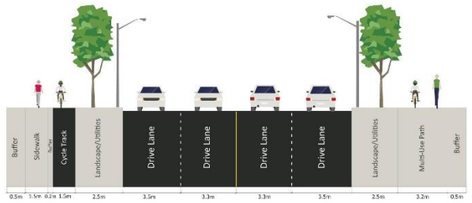
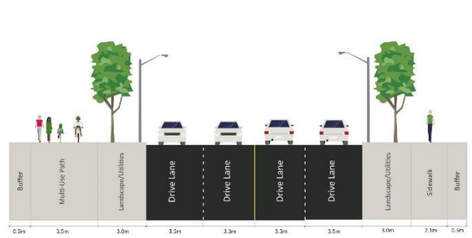
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
					• Provides 2.1 m sidewalks which meet the City's future sidewalk width requirements		• City of Vaughan does not have a uni-directional cycle track standard cross-section • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Road widths cannot accommodate transit vehicles	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.2 m multi-use path or side-by-side facilities is provided for pedestrians and cyclists		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.5 m multi-use path is provided for pedestrians and cyclists on one side • 2.1 m sidewalks are provided which meet the City's desired 2.0 m sidewalk width for intensification areas		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.5 m sidewalks are provided which meet AODA's minimum requirements	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• MUP/side-by-side facilities and landscaped area could be used to accommodate future design		• MUP/sidewalk, and landscaped area could be used to accommodate future design • One sided MUP and lack of a cycling facility on the other side may be more challenging to accommodate future designs / adjacent studies		• Cycle track and landscaped area could be used to accommodate future design	
	Sub-Category Assessment							From a design standard compliance perspective, **Alternatives C5-MA1** was preferred for the following reasons: • Meets Vaughan TMP recommended lane and facility widths and anticipated future required facility widths • Follow's the City of Vaughan's standard cross-section R-101
Community Connectivity	Provides enhanced connections to major destinations for all modes		• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • MUPs provide flexibility to connect with other cycle facilities on connecting roadways		• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • Does not provide connection for cyclists on one side of the road		• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • In-boulevard uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	

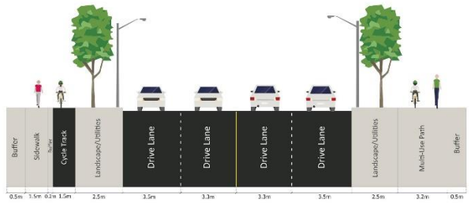
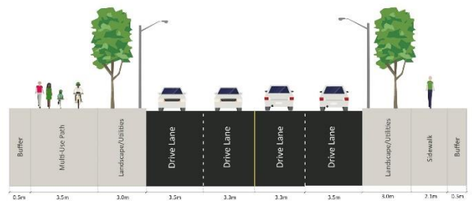
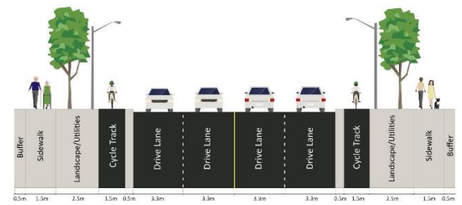
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP	Alternative C5 – MA2 Multi-Use Path (single sided)	Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks	Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)			
				• Road width cannot accommodate transit vehicles	
	Sub-Category Assessment				From a community connectivity perspective, **Alternatives C5-MA1** is preferred for the following reasons: • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)		• Alternative provides shared pedestrian and cyclist facilities • Side-by-side facilities/MUPs provide flexibility to connect with other cycle facilities on connecting roadways		• Alternative provides shared pedestrian and cyclist facilities • Does not provide cycling facilities on one side of the road and the lack of connection may be disruptive to cyclists and require a detour • MUP provide flexibility to connect with other cycle facilities on connecting roadways		• Alternatives provides separate facilities for pedestrians and cyclists • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities		• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Cyclists and pedestrians could be separated via a side-by-side facility which decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross		• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Cyclists and pedestrians could be separated with decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross		• Roadway and active transportation facilities supports an accessible network for all ages and abilities • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	
	Allows for streetscape / street furniture to enhance user experience		• Wide landscape features provide opportunities for street furniture		• Wide landscape features provide opportunities for street furniture		• Wide landscape features provide opportunities for street furniture	
	Sub-Category Assessment				From a quality and sustainable public realm perspective, **Alternatives C5-MA1 and C5-MA3** are equally preferred for the following reasons: • Both alternatives have the ability to provide separated pedestrian and cyclist facilities which provide flexibility

Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
								to connect with other cycle facilities on connecting roadways • Roadway and active transportation facilities supports an accessible network for all ages and abilities • Wide landscape features provide opportunities for street furniture
Overall Category Ranking			◕		◑		◑	**Alternative C5-MA1** is the preferred cross-sections from a Transportation perspective for the following reasons: • Achieve complete street principles and provides adequate infrastructure for all road users and meets City of Vaughan current and proposed future design standards • Pedestrians and cyclists are separated from vehicular traffic • Provide flexibility to connect with all other active transportation facilities on connecting roadways • and supports Block 27 as a transit-oriented community • Provides wider facility widths which meet the City's anticipated future required facility widths
Socio-Economic Environment								
Supports Surrounding Land-Uses	Conforms with land-use policy objectives	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel	◔	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel	○	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Generally conforms to policy objectives of encouraging active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a	

Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)		lanes and moving traffic (Growth Plan 3.2.3.4) • The lack of MUP on one side of the street has the opportunity to decrease the comfort and ease of use for cyclists accessing both the north and south mixed-use areas along Collector Street 5 as it will require additional maneuvering through intersections to turnaround • Opportunity to accommodate bus service (VOP 4.2.1.24) • Does not align with City's Pedestrian and Bicycle Master Plan (Dec 2020) because cycling facility are not provided on both sides of the road which is a requirement for major collector roads per the Master Plan		vertically separated (raised) bike lane (Growth Plan 3.2.3.4) • Does not accommodate bus service and is not transit supportive which is an objective in the VOP (VOP 4.2.1.24) and Block 27 Secondary Plan (Transit Orientated Community) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses		• Dedicated cycling facilities buffered via landscaping supports land uses and built forms by encourages safe, active modes of transportation to access mixed use areas and increases visibility of cyclists • Side-by-side facilities/MUPs are unfavourable given low-rise mixed land-uses along both sides of Collector Street 5 and driveways		• The multi-use path helps to encourage active forms of transportation to support mixed use areas along one side of Collector Street 5 • MUPs are unfavourable given low-rise mixed land-uses along both sides of Collector Street 5 and driveways, however, the reduction of MUP to one side of street is more supportive of the surrounding residential uses (having the MUP on only one side of the street reduces the number of conflicts between vehicles and users of the MUP than if the MUP was provided on both sides of the street – i.e., C5-MA1)		• Raised and buffered cycle tracks will encourage active forms of transportation to support mixed use areas along Collector Road 5 • Uni-directional cycle tracks allow cyclists to access both sides of the roadway • Uni-directional cycling facilities are favourable given low rise and mid-rise residential uses along both sides of Collector Street 5 • Does not support transit to support the transit orientated community	
	Encourages aesthetic and adheres to urban design principles		• Provides for street trees which improves aesthetics • High amount of pavement dedicated to vehicle lanes which reduces the aesthetics		• Provides for street trees which improves aesthetics • Lowest amount of continuous pavement which improves aesthetics		• Provides for street trees which improves aesthetics • High continuous amount of pavement which decreases aesthetics	

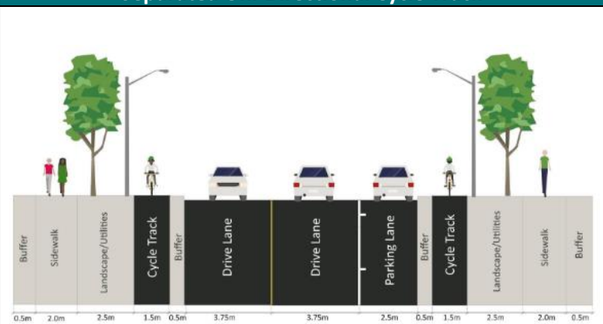
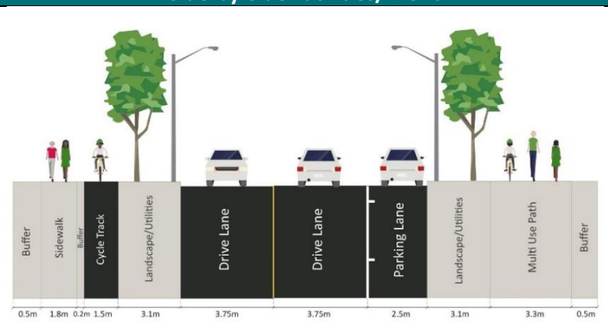
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			• Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics		and increases opportunity for more landscaping • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics			
	Sub-Category Assessment							**Alternative C5-MA1** is preferred from a land-use policy compliance perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics
Climate Change	Ability to address climate change		• Moderate imperviousness, moderate chance to address climate change		• Moderate imperviousness, moderate chance to address climate change		• Moderate imperviousness, moderate chance to address climate change	Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Sub-Category Assessment							**All Alternatives** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
Overall Category Ranking								**Alternative C5-MA1** is preferred from an overall Socio-Economic Environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated

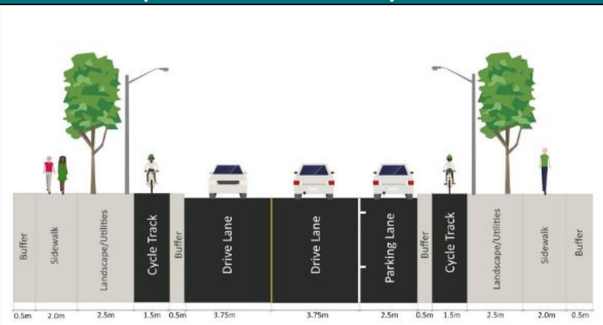
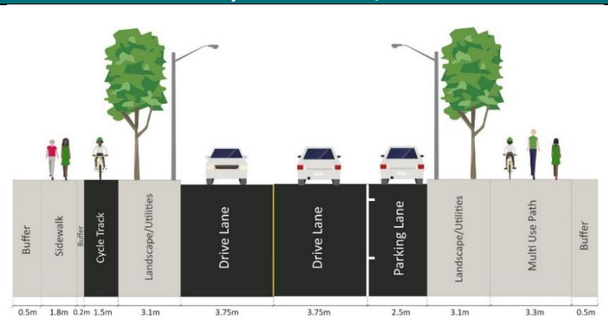
Evaluation Criteria		Alternative C5 – MA1 SIde-by-Side Facilities/MUP		Alternative C5 – MA2 Multi-Use Path (single sided)		Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
								Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
Cost & Constructability								
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction	●	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • Second largest boulevard width which will provide increased feasibility for LIDs	●	• Construction of MUP and sidewalks are standard and construction is not anticipated to be complex • LID can be easily implemented within the landscape area adjacent to the pavement • More room for utilities	◕	• Construction of roadway in boulevard raised and buffered cycle tracks is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the cycle tracks complicates the implementation of LIDs as they obstruct/ interfere with the potential connection of catch basins to LIDs underneath the landscape area • Smallest boulevard width which will provide decreased feasibility for LIDs	
	Scale of Capital Costs	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking		◑		◑		◑		**All Alternatives** are preferred from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facilities / MUP / side-by-side facilities are standard within the City of Vaughan and

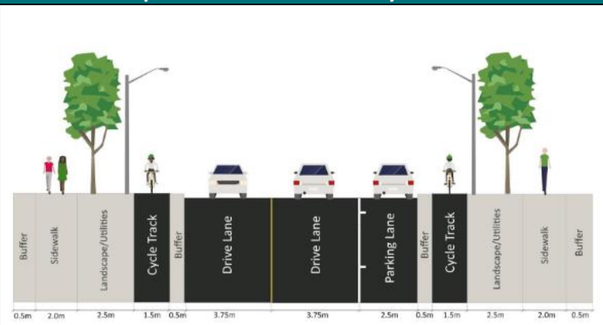
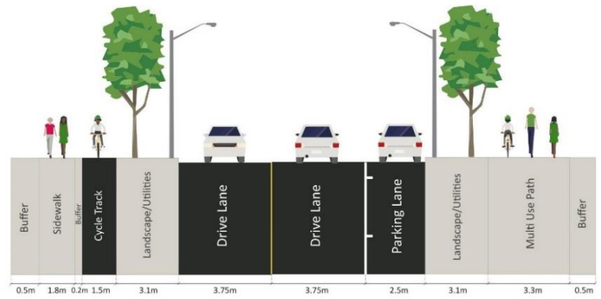
Evaluation Criteria	Alternative C5 – MA1 SIde-by-Side Facilities/MUP	Alternative C5 – MA2 Multi-Use Path (single sided)	Alternative C5 – MA3 Separated Uni-Directional Cycle Tracks	Comments / Rationale
	 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)			construction is not anticipated to be complex • Capital, operational, and maintenance costs are anticipated to be similar
OVERALL EVALUATION	◕	◑	◑	**Alternative C5-MA1 was selected as the preferred cross-section for Street 5 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users and meet the City's design standards • Pedestrians and cyclists are separated from vehicular traffic • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block and as a transit orientated community • Provides wider facility widths which meet the City's anticipated future required facility widths • Conforms with City of Vaughan land-use policy objectives, providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change

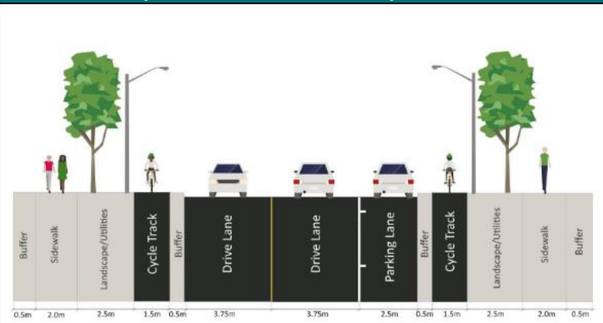
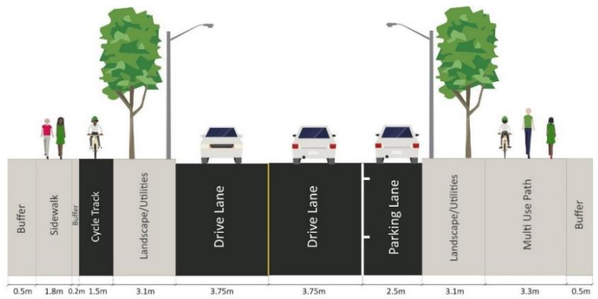
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 6 – Minor Collector)

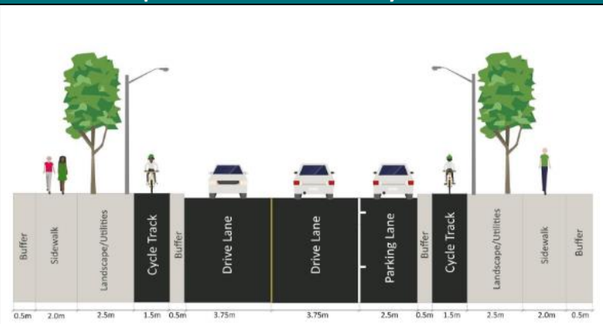
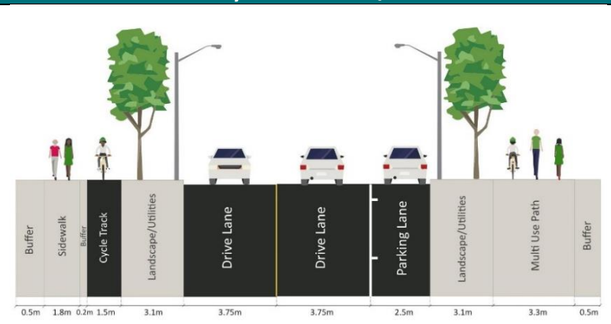
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

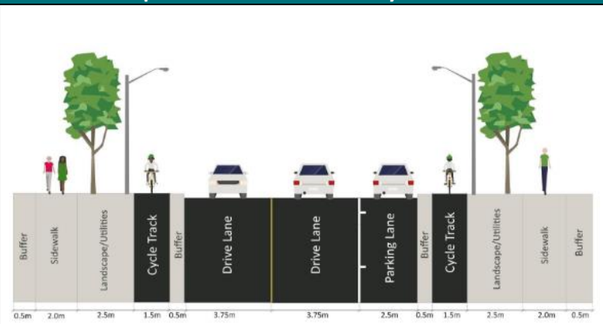
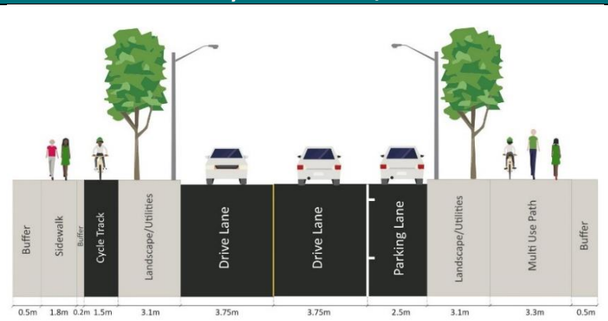
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Transportation						
Active Transportation Road Safety	Achieves complete street principles	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Increased perceived cyclist comfort and safety will encourage users of schools, parks and mixed-use areas	
	Considers pedestrian/cyclist safety (**note**: 2/3 of Collector Street 6 is along low-rise residential land-uses, schools, and SWM pond, while the 1/3 is through a woodlot and located between the community hub and mid-rise mixed-use)	◕	• Provides safer conditions given the surrounding low and mid-rise residential uses and low-rise mixed-use land-uses adjacent to Collector Street 6 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	◑	• Provides less favourable conditions compared to Alternative C6-MI1 (uni-directional cycle track) given the surrounding low and mid-rise residential uses and low and mid-rise mixed-use land-uses adjacent to Collector Street 6 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	
	Achieves Vision Zero objectives	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	
	Sub-Category Assessment		●		◕	**Alternative C6-MI1** is preferred from an active transportation road safety perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the surrounding low-rise mixed and residential land-uses along Collector Road 6 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety

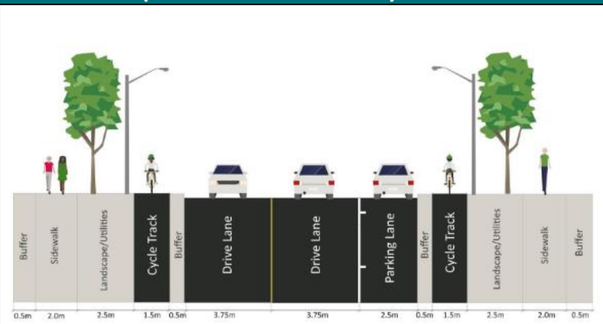
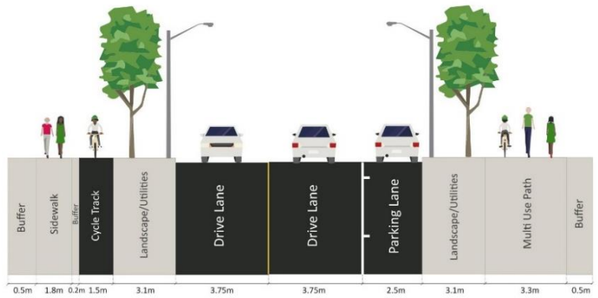
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities			
Transit Serviceability	Accommodates future transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Ability to convert the parking lane, bike lane, or wide landscape/utilities into a lane to adapt to changing options in transit service provision	◑	• Ability to convert the parking lane, bike lane, or landscape/utilities into a lane to adapt to changing options in transit service provision	
	Sub-Category Assessment	◔		◔		**Alternatives C6-M1** and **C6-M2** are preferred equally from a transit serviceability perspective for the following reasons: • Both alternatives can accommodate future transit infrastructure • Both alternatives have the ability to convert the parking lane, bike lane, or landscape / utilities into a lane to adapt to changing options in transit service provision
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	●	• Provides 2.0 m sidewalks and minimal bike lane width of 1.5 m which meet City standards for AT facilities	●	• Provides 1.8 m sidewalks/1.5 m bike lanes or 3.3 m MUP which meet City standards for AT facilities	
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	●	• Pedestrians are separated by a 2.5 m landscape / utilities buffer which enhances safety and provides opportunities to implement safety features • Cyclists have a 0.5 m buffer from travel lane in each direction	●	• Pedestrians and cyclists are off-street and separated by a 3.1 m landscape / utilities buffer from travel lanes which enhances safety and provides opportunities to implement safety features	
	Sub-Category Assessment	●		●		**Alternatives C6-MI1 and C6-MI2** are equally preferred from an active transportation perspective for the following reasons: • Both alternatives provide required sidewalk and cycle track facility widths • Both alternatives have wide landscape and utility facility / buffers which enhances safety and provides opportunities to implement safety features
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	

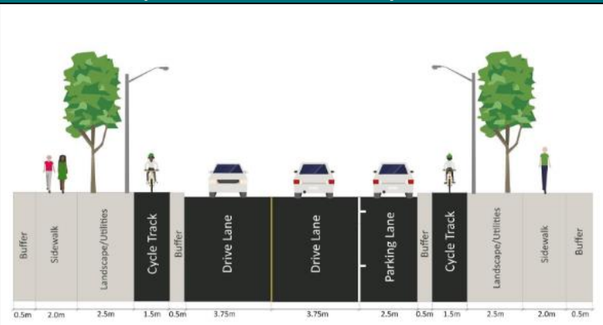
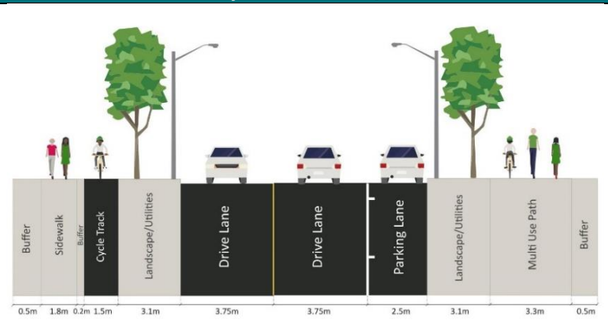
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment					**Alternatives C6-MI1 and C6-MI2** are preferred equally from a road capacity perspective for the following reasons: • Both alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards		• Sidewalk and bike lane widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • City requires the provision of cycle tracks on both sides of collector roads, and prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road, and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.		• MUP / side-by-side facility widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.8 m sidewalk is provided which exceeds AODA's 1.5 m requirement		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.3 m multi-use path or 3.5 m side-by-side facilities are provided for pedestrians and cyclists	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs		• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
	Sub-Category Assessment					**Alternatives C6-MI1 and C6-MI2** are preferred equally from a design standard compliance perspective following reasons: • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Parking lane, landscaped area and bike lanes could be used to accommodate future designs

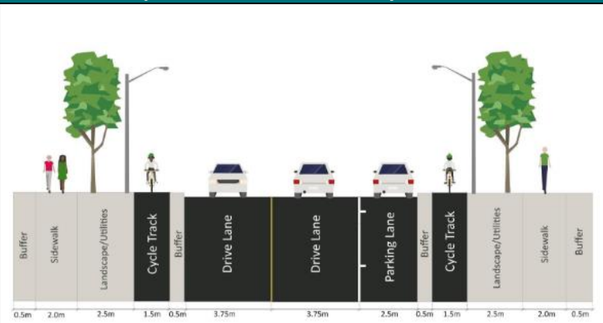
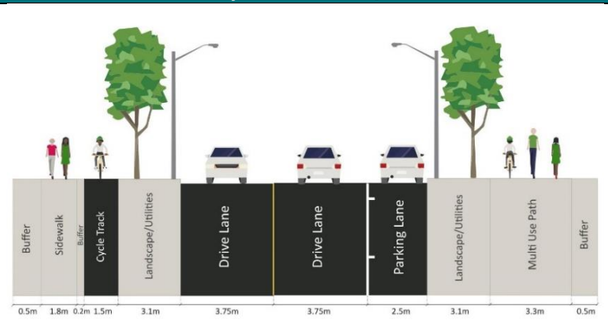
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Community Connectivity	Provides enhanced connections to major destinations for all modes	●	• Provides enhanced connections by vehicle, pedestrians and bicycles to reach major destinations by all modes • Allows for a smooth connection from Collector Road 6 onto the proposed trail along Collector Road 6 as well as on to the City of Vaughan's 'Super Trail" along the TC pipeline which will be designed as a multi-use paths	●	• Provides enhanced connections by vehicle, pedestrians and bicycles to reach major destinations by all modes • Allows for a smooth connection from Collector Road 6 onto the proposed trail along Collector Road 6 as well as on to the City of Vaughan's 'Super Trail" along the TC pipeline which will be designed as a multi-use path	
	Sub-Category Assessment	●		●		**Alternatives C6-MI1 and C6-MI2** are equally preferred from a community connectivity perspective for the following reasons: • Both alternatives will allow for a smooth connection from Collector Road 6 onto the proposed trail along Collector Road 6 as well as on to the City of Vaughan's 'Super Trail". Special design considerations may be required for the transition at the next Detailed Design phase.
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	●	• Alternative provides separate pedestrian and cycling pathways • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways and trails (i.e., Collector Street 6 trail and "Super-Trail")	●	• Alternative provides multi use pathways for both pedestrians and cyclists • MUP provide flexibility to connect with other cycle facilities on connecting roadways and trails (i.e., Collector Street 6 trail and "Super-Trail")	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Cycle tracks in a greater distance for pedestrians to cross the street (less comfortable, but safe) • Cycle tracks are separated from travel/parking lane by a 0.5 m buffer	◑	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater potential for collisions between cyclists and pedestrians since cycling facilities are mixed/next to the sidewalk which may not be preferred by children or seniors • Off-street cycling facilities results in a shorter distance for pedestrians to cross the street (increased comfort)	

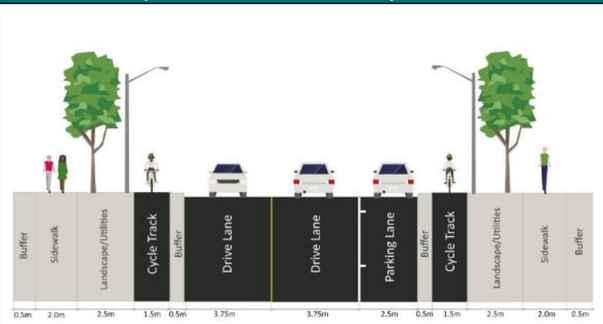
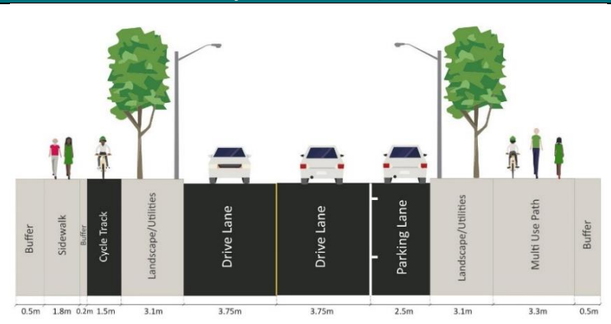
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Allows for streetscape / street furniture to enhance user experience	●	• Wide landscape buffer provides opportunities for street furniture / streetscape	●	• Wide landscape buffer provides opportunities for street furniture / streetscape	
	Sub-Category Assessment	◔		◔		**Alternatives C6-MI1 and C6-MI2** are equally preferred from a quality and sustainable public realm perspective for different reasons: • Both alternatives provide flexibility to connect with other cycle facilities on connecting roadways and trails (i.e., Collector Street 6 trail and "Super-Trail") • Both alternatives provide a wide landscape buffer provides opportunities for street furniture / streetscape
Overall Category Ranking		◔		◔		**Alternatives C6-MI1 and C6-2** are equally preferred cross-sections from a Transportation perspective for the following reasons: • Both alternatives achieve complete street principles and provides sufficient infrastructure for all road users which meet the City's standards and are AODA compliant • Both alternatives achieve Vision Zero objectives by providing provide off-street separated and buffered facilities for both pedestrians and cyclists which enhances safety • Both alternatives provide flexibility to connect with other cycle facilities on connecting roadways and trails • Both alternatives will require a mixing zone during the transition of AT facilities to the proposed trail along Collector Street 6 and "Super Trail" but will allow smooth transitions (note: Special design considerations may be required for the transition at the next Detailed Design)

Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Socio-Economic Environment						
Supports Surrounding Land-Uses	Conforms with land-use policy objectives	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan) • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan	●	• Supports the City of Vaughan's "Super Trail" initiative • Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses and conforms with land-use policy objectives	◕	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given residential uses and presence of driveways • Supports a smooth transition from Collector Street 6 onto the City of Vaughan's 'Super Trail' that is proposed along the TC pipeline. Localized special design considerations may be required during the subsequent Detailed Design process for the transition to the trail.	◑	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Supports a smooth transition from Collector Street 6 onto the City of Vaughan's 'Super Trail' that is proposed along the TC pipeline and trail along Street 6. Localized special design considerations may be required during the subsequent Detailed Design process for the transition to the trail. • MUPs are less favourable compared to uni-directional cycle tracks given the surrounding residential land-uses	

Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Encourages aesthetic and adheres to urban design principles		• Provides a large landscape width for street trees which improves aesthetics • Moderate amount of continuous pavement without buffer which decreases aesthetics		• Provides a large landscape width for street trees which improves aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which improves aesthetics	
	Sub-Category Assessment					**Alternatives C6-MI1 and C6-MI2** are equally preferred equally from a land-use perspective for the following reasons: • Both alternatives conform with the City of Vaughan's land-use policy objectives • Both alternatives provide active transportation facilities on both side of the road to support the low-rise mixed-uses on both sides of the road • Both alternatives will support a smooth transition from Collector Street 6 onto the proposed trail along Collector Street 6 and 'Super Trail' proposed along the TC pipeline. Localized special design considerations may be required during the subsequent Detailed Design process for the transition to the trail.
Climate Change	Ability to address climate change		• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change		• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width to implement LID and tree canopy which will increase evapotranspiration to help address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives		• Moderate imperviousness expected for this cross section • The placement of the bike lane and/ parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area • Moderate boulevard width will provide some opportunities for LIDs		• Moderate imperviousness expected for this cross section • Due to the parking lane, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.

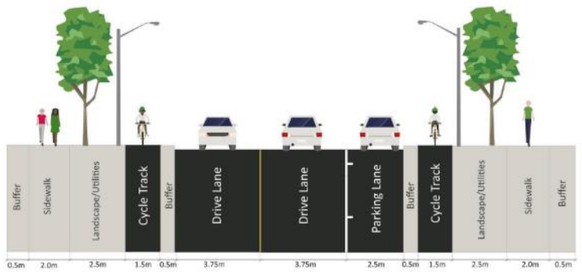
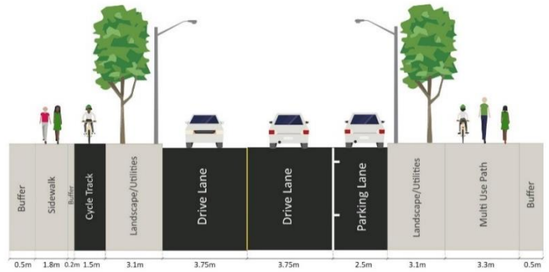
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment		◑		◑	**Alternatives C6-MI1 and C6-MI2** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change LID can be easily implemented within the landscape area adjacent to the pavement • Moderate imperviousness expected for this cross section • Due to the parking/cycle track, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs
Overall Category Ranking			◕		◕	**Alternatives C6-MI1 and C6-MI2** are equally preferred cross-sections from a Socio-Economic environment perspective for the following reasons: • Both alternatives conform with City of Vaughan land-use policy objectives • Both alternatives provide active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Both alternatives will support a smooth transition from Collector Street 6 onto the proposed trail along Collector Street 6 and ‘Super Trail’ proposed along the TC pipeline • Both alternatives provide moderate imperviousness with moderate ability to address climate change
Cost & Constructability						

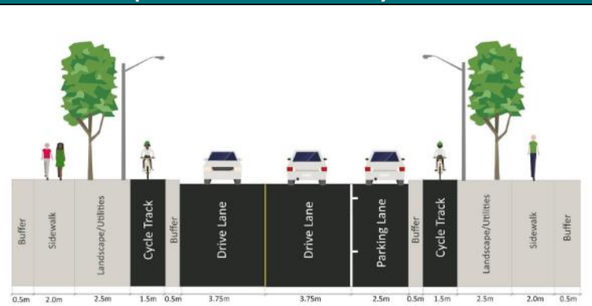
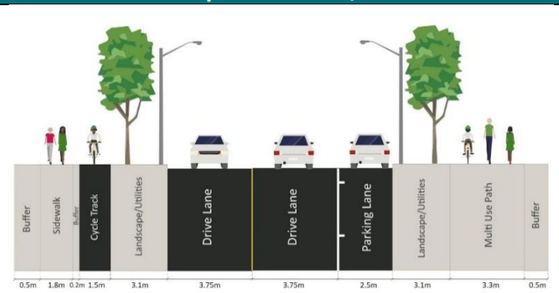
Evaluation Criteria		Alternative C6 – MI1 Separated Uni-Directional Cycle Track		Alternative C6 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction	◕	• Construction of roadway with on-street uni-directional bike lanes is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	◕	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	
	Scale of Capital Costs	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking		◑		◑		**Alternatives C6-MI1 and C6-MI2** are equally preferred cross-sections from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facility or MUP/side-by-side facilities are standard within the City of Vaughan and complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar
OVERALL EVALUATION		◕		◕		**Alternatives C6-MI1 and C62 were equally preferred cross-sections for Street 6 for the following reasons:** • Both alternatives achieve complete street principles and provides sufficient infrastructure for all road users which meet the City's standards and are AODA compliant • Both alternatives achieve Vision Zero objectives by providing provide off-street separated and buffered facilities for both pedestrians and cyclists which enhances safety

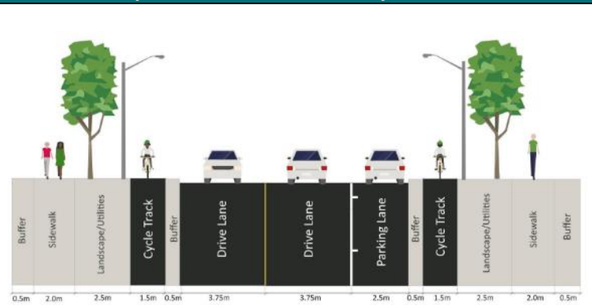
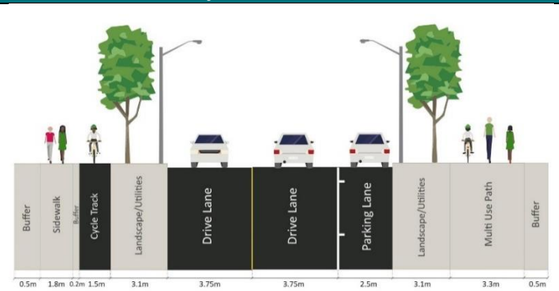
Evaluation Criteria	Alternative C6 – MI1 Separated Uni-Directional Cycle Track	Alternative C6 – MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	• Both alternatives provide flexibility to connect with other cycle facilities on connecting roadways and trails • Both alternatives conform with City of Vaughan land-use policy objectives • Both alternatives provide active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Both alternatives allow for a smooth transition from Collector Street 6 onto the City of Vaughan's 'Super Trail' and trail proposed along Collector Street 6. Localized special design considerations may be required during the subsequent Detailed Design process for the transition to the trail • Both alternatives provide moderate imperviousness with moderate ability to address climate change • Construction of either facility are standard within the City of Vaughan and construction complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar for both alternatives **Given Uni-Directional cycling facilities are preferred within the City of Vaughan and would provide better connections with connecting roadways (e.g., smoother connections), Alternative C6-MI1 was selected as the preferred to be implemented.**

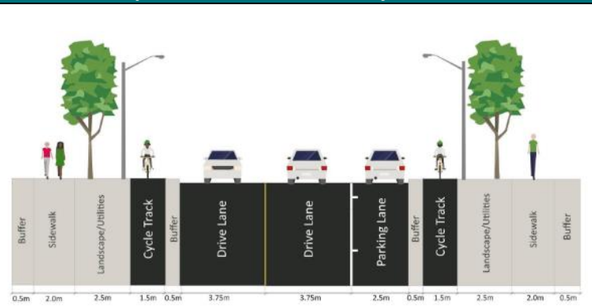
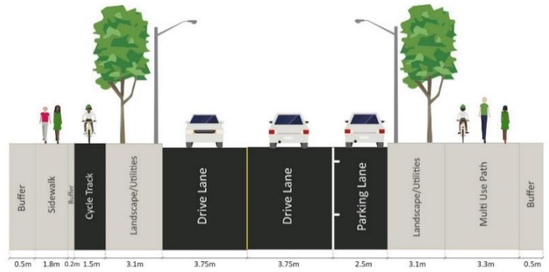
Alternative Evaluation Table: Road Alignment Cross Sections (Street 7 – Minor Collector)

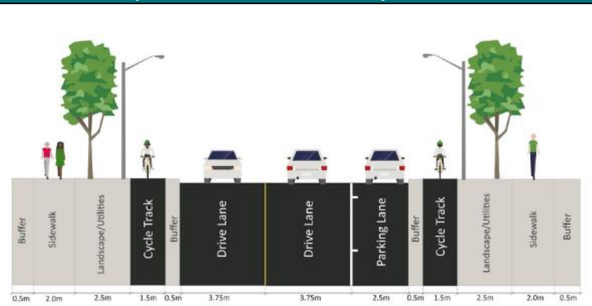
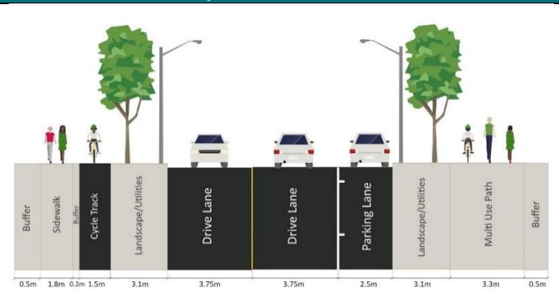
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

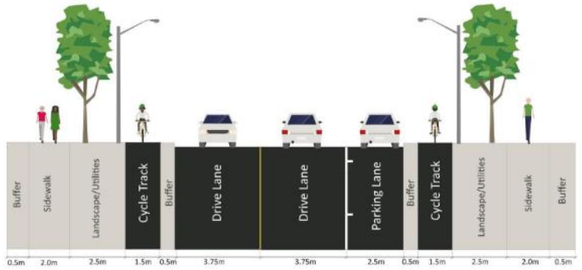
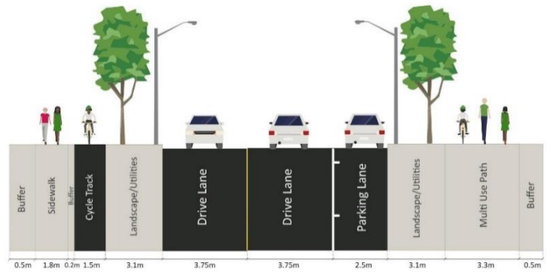
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Transportation						
AT Road Safety	Achieves complete street principles	◕	• Achieves complete street principles • Provides sufficient infrastructure for all road users • Decreased perception of safety given presence of driveways and opportunities for conflicts which could discourage active modes of transportation	●	• Achieves complete street principles • Provides sufficient infrastructure for all road users	
	Considers pedestrian/cyclist safety (**note**: Collector Street 7 is along low and mid-rise residential land-uses, and schools)	●	• Provides safer conditions given the surrounding low-rise residential and low-rise mixed-use land-uses adjacent to Collector Street 7 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	◑	• Provides less favourable conditions compared to Alternative C7-MI1 (uni-directional cycle track) due to the surrounding low-rise residential and low-rise mixed-use land-uses adjacent to Collector Street 7 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety	
	Achieves Vision Zero objectives	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	●	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities	
	Sub-Category Assessment	●		◕		**Alternative C7-MI1** is preferred from an active transportation road safety perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the low-rise mixed and residential uses along Collector Road 7 • Provides off-street separated facilities for both pedestrians and cyclists which enhances safety

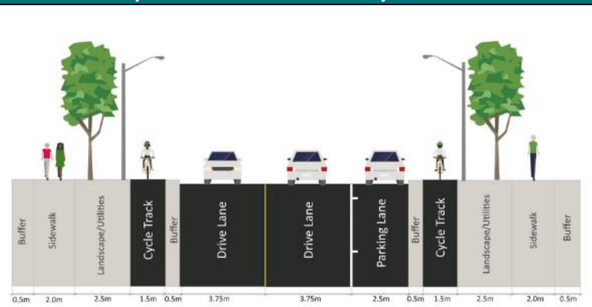
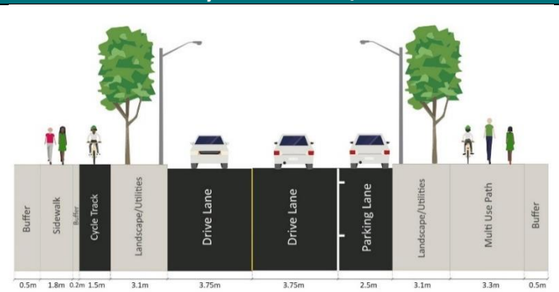
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
					• Roadway can accommodate future transit route	• Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities
Transit Serviceability	Accommodates future transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Ability to convert the parking lane, bike lane, or wide landscape/utilities into a lane to adapt to changing options in transit service provision	◑	• Ability to convert the parking lane, bike lane, or landscape/utilities into a lane to adapt to changing options in transit service provision	
	Sub-Category Assessment		◕		◕	**Alternatives C7-M1** and **C7-M2** are preferred equally from a transit serviceability perspective for the following reasons: • Both alternatives can accommodate future transit infrastructure • Both alternatives have the ability to convert the parking lane, bike lane, or landscape / utilities into a lane to adapt to changing options in transit service provision
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	●	• Provides 2.0 m sidewalks and minimal bike lane width of 1.5 m which meet City standards for AT facilities	●	• Provides 1.8 m sidewalks/1.5 m bike lanes or 3.3 m MUP which meet City standards for AT facilities	
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	●	• Pedestrians are separated by a 2.5 m landscape / utilities buffer which enhances safety and provides opportunities to implement safety features • Cyclists have a 0.5 m buffer from travel lane in each direction	●	• Pedestrians and cyclists are off-street and separated by a 3.1 m landscape / utilities buffer from travel lanes which enhances safety and provides opportunities to implement safety features	
	Sub-Category Assessment		●		●	**Alternatives C7-MI1 and C7-MI2** are equally preferred from an active transportation perspective for the following reasons: • Both alternatives provide required sidewalk and cycle track facility widths • Both alternatives have wide landscape and utility facility / buffers which enhances safety and provides opportunities to implement safety features

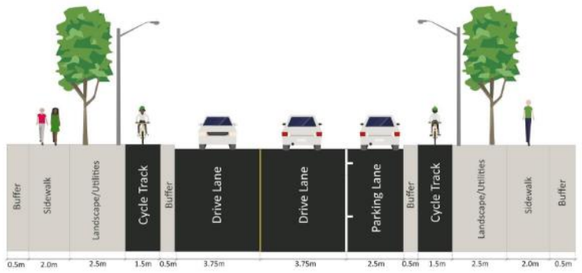
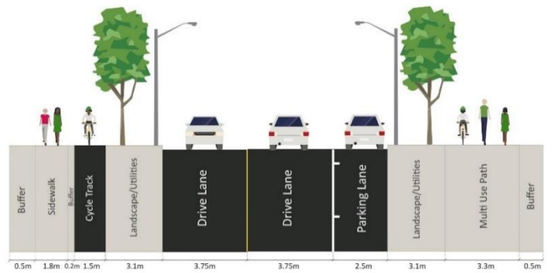
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	●	• Two travel lanes provide sufficient road capacity for projected traffic needs	
	Sub-Category Assessment		●		●	**Alternatives C7-MI1 and C7-MI2** are preferred equally from a road capacity perspective for the following reasons: • Both alternatives provide sufficient road capacity for projected traffic needs
Design Standard Compliance	Compliance with City and Regional design standards	●	• Sidewalk and bike lane widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • City requires the provision of cycle tracks on both sides of collector roads, and prefers the implementation of uni-directional cycle tracks across Vaughan • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road, and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	●	• MUP / side-by-side facility widths meet the recommended facility widths in the City of Vaughan's 2020 Design Standards • Conforms with the City's Engineering Design Criteria & Standard Drawings (Dec. 2020) which require sidewalks and cycling facilities be provided both sides of the road and lay-by parking be provided adjacent to schools, parks, open spaces, commercial properties, etc.	
	Meets accessibility standards (AODA)	●	• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.8 m sidewalk is provided which exceeds AODA's 1.5 m requirement	●	• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.3 m multi-use path or 3.5 m side-by-side facilities are provided for pedestrians and cyclists	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)	◔	• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	◔	• Parking lane, landscaped area and bike lanes could be used to accommodate future designs	
	Sub-Category Assessment		●		●	**Alternative C7-MI1 and C7-MI2** are preferred equally from a design standard compliance perspective following reasons: • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant

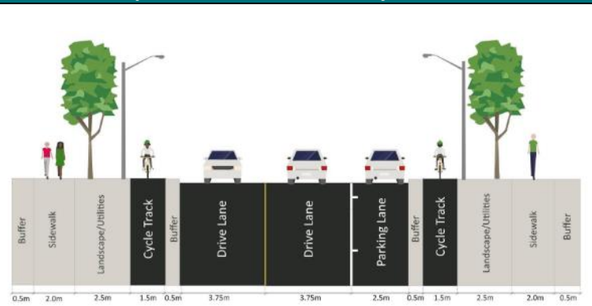
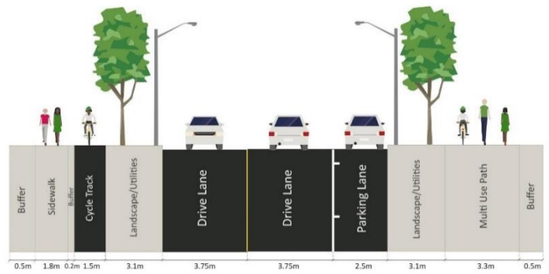
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
					• Parking lane, landscaped area and bike lanes could be used to accommodate future designs
Community Connectivity	Provides enhanced connections to major destinations for all modes	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	●	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations	
	Sub-Category Assessment		●		●	**Alternatives C7-MI1 and C7-MI2** are preferred equally from a community connectivity perspective for the following reasons: • Both alternatives provide enhanced connections for vehicles, pedestrians and cyclists to reach major destinations
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	◕	• Provides separate facilities for pedestrians and cyclists • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 (note: localized special design considerations may be required during Detailed Design to facilitate the transition) • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	◕	• Provides separate facilities for pedestrians and cyclists • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 (note: localized special design considerations may be required during Detailed Design to facilitate • MUP/side-by-side facilities provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports accessible network for all ages and abilities • Greater separation between pedestrians and cyclists which minimizes risk for collisions which may be preferred for children and seniors • Cycle tracks results in a greater distance for pedestrians to cross the street (less comfortable, but safe) • Cycle tracks are separated from travel/parking lane by a 0.5 m buffer	◑	• Roadway and active transportation facilities supports accessible networks for all ages and abilities • Greater potential for collisions between cyclists and pedestrians since cycling facilities are mixed/next to the sidewalk which may not be preferred by children or seniors • Off-street cycling facilities results in a shorter distance for pedestrians to cross the street (increased comfort)	

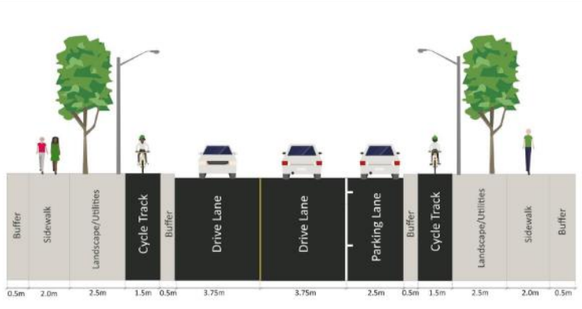
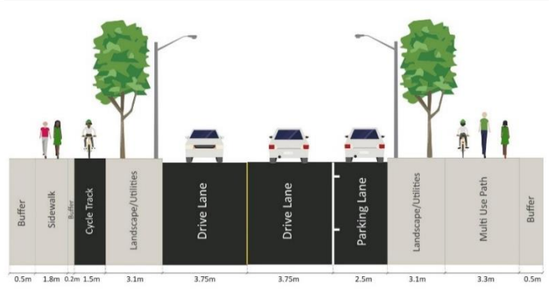
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Allows for streetscape / street furniture to enhance user experience		• Wide landscape buffer provides opportunities for street furniture / streetscape		• Wide landscape buffer provides opportunities for street furniture / streetscape	
	Sub-Category Assessment					**Alternative C7-MI1** is preferred from a quality and sustainable public realm perspective for the following reasons: • Alternative provides pedestrian and cycling facilities with a wide buffer which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways
Overall Category Ranking						**Alternative C7-MI1** is the preferred cross-section from an overall Transportation perspective for the following reasons: • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the surrounding low-rise mixed and residential uses along Collector Road 7 • Separated buffered pedestrian and cyclist facilities which enhances safety • Alternative provides greater separation between pedestrian and cycling facilities which minimizes risk for collisions and may be preferred for children and seniors • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 (note: localized special design considerations may be required during Detailed Design to facilitate the transition

Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Socio-Economic Environment						
Supports Surrounding Land-Uses	Conforms with land-use policy objectives	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan) • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4) • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses	●	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3	◕	• Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • MUPs are less favourable compared to uni-directional cycle tracks given the surrounding residential land-uses • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3	
	Encourages aesthetic and adheres to urban design principles	◕	• Provides a large landscape width for street trees which improves aesthetics • Moderate amount of continuous pavement without buffer which decreases aesthetics	◕	• Provides a large landscape width for street trees which improves aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which improves aesthetics	

Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
				 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
	Sub-Category Assessment					**Alternatives C7-MI1** is preferred from a land-use perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 • Provides a moderate to large landscaping area which improves aesthetics
Climate Change	Ability to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	◑	• Moderate imperviousness with moderate ability to address climate change • Moderate landscape width to implement LID and tree canopy which will increase evapotranspiration to help address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives	◑	• Moderate imperviousness expected for this cross section • The placement of the bike lane and/ parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area • Moderate boulevard width will provide some opportunities for LIDs	◑	• Moderate imperviousness expected for this cross section • Due to the parking lane, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Sub-Category Assessment		◑		◑	**Alternatives C7-MI1 and C7-MI2** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness with moderate ability to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change LID can be easily implemented within the landscape area adjacent to the pavement

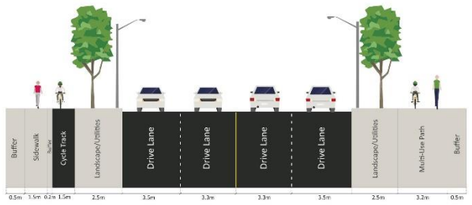
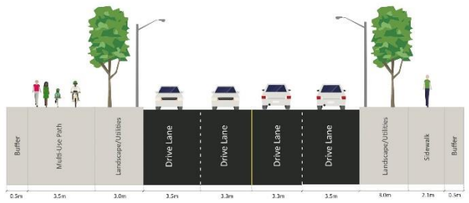
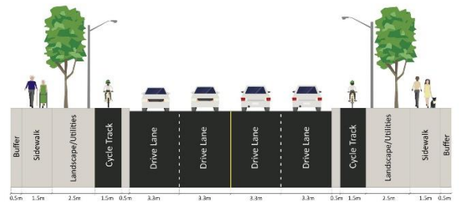
Evaluation Criteria		Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks		Alternative C7 – MI2 Side-by-Side Facilities/MUPs		Comments / Rationale
					 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
						• Moderate imperviousness expected for this cross section • Due to the parking/cycle track, implementation of LIDs will be difficult on one side of the pavement • Moderate boulevard will provide some opportunities for LIDs
Overall Category Ranking						**Alternative C7-MI1** is the preferred cross-section from an overall Socio-Economic Environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road • Uni-directional cycling facilities are favourable given the surrounding residential land-uses • Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 • Provides a moderate to large landscaping area which improves aesthetics • Moderate imperviousness with moderate ability to address climate change
Cost & Constructability						
Engineering Feasibility and Construction Cost	Ease of Construction		• Construction of roadway with on-street uni-directional bike lanes is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area		• Construction of roadway with MUP is standard and construction is not anticipated to be complex • The placement of the parking lane complicates the implementation of LIDs as they obstruct/interfere with the potential connection of catch basins to LIDs underneath the landscape area	
Capital Cost	Scale of Capital Costs		• Construction costs for the road are anticipated to be similar		• Construction costs for the road are anticipated to be similar	
Operating and Maintenance Costs	Operating and Maintenance Costs		Operating and maintenance costs are anticipated to be similar		• Operating and maintenance costs are anticipated to be similar	

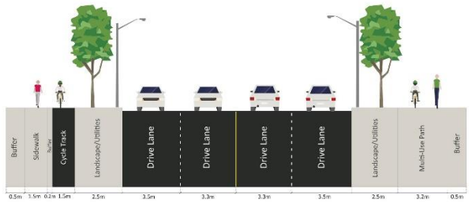
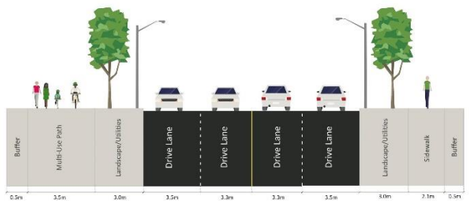
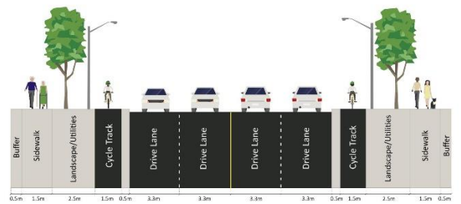
Evaluation Criteria	Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks	Alternative C7 – MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
Overall Category Ranking	◑	◑	**Alternatives C7-MI1 and C7-MI2** are equally preferred cross-sections from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facility or MUP/side-by-side facilities are standard within the City of Vaughan and complications are not anticipated • Construction, operating and maintenance costs are anticipated to be similar
OVERALL EVALUATION	◔	◑	**Alternative C7-MI1 is the preferred alternative designs for Street 7 for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users which meet the City's standards • Provides safer conditions given the surrounding low-rise residential and low-rise mixed-use land-uses along Collector Road 7 • Separated buffered pedestrian and cyclist facilities • Meets the recommended facility widths in the City of Vaughan's 2020 Design Standards and are AODA compliant • Achieves Vision Zero objectives by providing separated buffered pedestrian and cyclist facilities • Alternative provides greater separation between pedestrian and cycling facilities which minimizes risk for collisions and may be preferred for children and seniors • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways • Conforms with City of Vaughan land-use policy objectives • Provides active transportation facilities on both side of the road supports the low-rise mixed-uses on both sides of the road

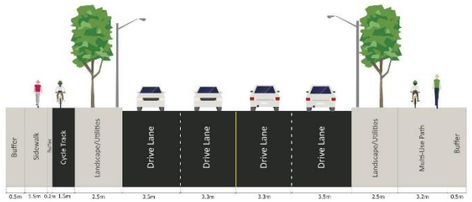
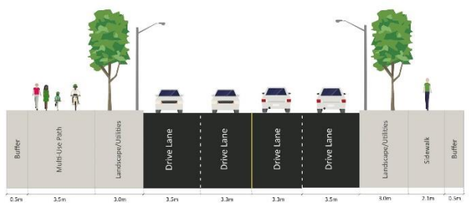
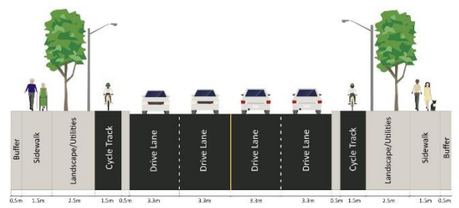
Evaluation Criteria	Alternative C7 – MI1 Separated Uni-Directional Cycle Tracks	Alternative C7 – MI2 Side-by-Side Facilities/MUPs	Comments / Rationale
		 **Note:** This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	
			• Will provide for a smooth transition into the proposed trail along the bend of Collector Street 7 and Collector Street 3 • Provides a moderate to large landscaping area which improves aesthetics • Moderate imperviousness with moderate ability to address climate change

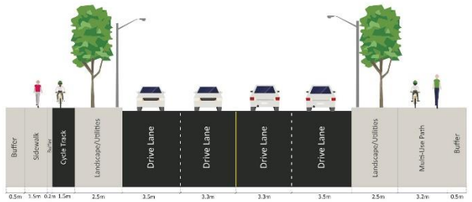
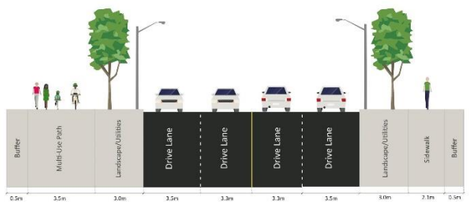
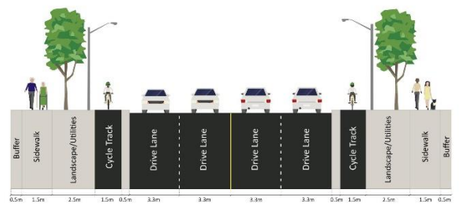
Block 27 Collector Roads Municipal Class Environmental Assessment Study
Alternative Evaluation Table: Road Alignment Cross Sections (Street 8 – Major Collector)

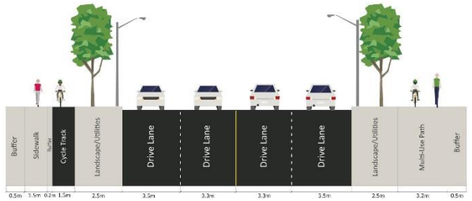
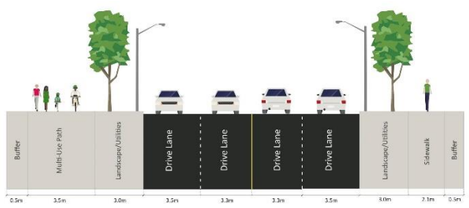
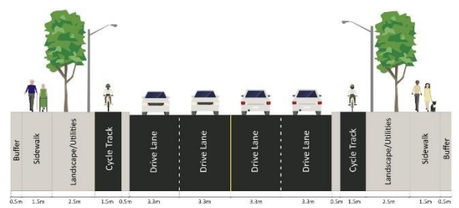
Legend: ○ ◔ ◑ ◕ ● Least Benefits / Most Impacts → Most Benefits / Least Impacts

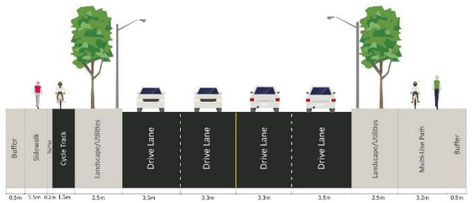
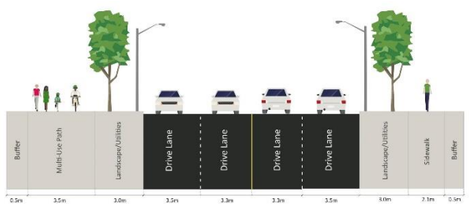
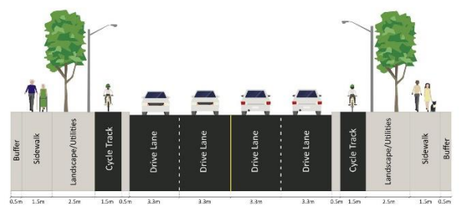
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
Transportation								
Active Transportation Road Safety	Achieves complete street principles	◕	• Achieves complete street principles • Provides adequate infrastructure for all roadway users	◑	• Achieves complete street principles on one side of the road (partial) • No cycling infrastructure on one side of road	◕	• Achieves complete street principles • Provides adequate infrastructure for all road users • Decreased perception of bicycle safety given proximity of bicycle lane to vehicle lanes which offers less support for community hub and GO Station to be accessed via bicycle	
	Considers pedestrian/cyclist safety	◔	• Provides less favourable conditions compared to uni-directional cycle tracks due to the mid-rise residential and mid-rise mixed-use uses along Collector Road 8 • Shared multi-use path for both pedestrians and cyclists outside of the travel lanes may result in collisions • Pedestrian facilities placed side by side with cycling facilities may help reduce collisions between pedestrians and cyclists	◔	• Provides less favourable conditions compared to uni-directional cycle tracks due to the mid-rise residential and mid-rise mixed-use uses along Collector Road 8 • Cycle tracks are not provided on one side of the street and will require cyclists to cycle on-street • Wide multi-use pathway for pedestrians and cyclists outside of the travel lanes • Pedestrian facilities mixed with cycling facilities in MUP increases risk of collisions	◕	• Provides safer conditions given the mid-rise residential and mid-rise mixed-use uses along both sides of Collector Street 8 • Pedestrian and cycling facilities are at the minimum standard widths along with a buffer between cyclists and travel lane, however, given intensification area by transit hub, may result in collisions • Pedestrians and cyclists are in separated facilities which minimizes potential collisions	
	Achieves Vision Zero objectives	◕	• Separated pedestrian and cycling facilities from vehicle traffic	◔	• Separated pedestrian and cycling facilities from vehicle traffic on one side • Cyclists will need to cycle on-street on one side of the road	◕	• Separated pedestrian and cyclist facilities	
	Sub-Category Assessment		◑		◔		◕	From an AT road safety perspective, **Alternative C8-MA3** is preferred for the following reasons:

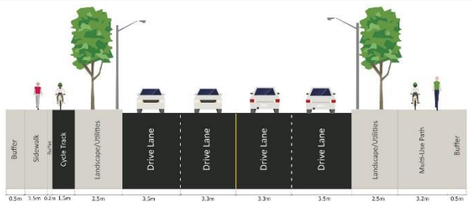
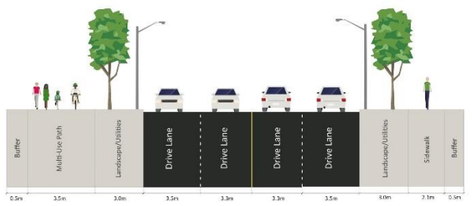
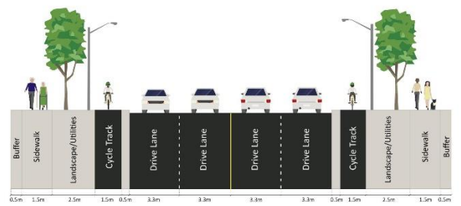
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)						• Achieves complete street principles and meets the City's minimum standard active transportation facility widths • Provides safer conditions given the mid-rise residential and mid-rise mixed-use uses along both sides of Collector Street 8 • Pedestrians and cyclists are in off-street separated facilities which minimizes potential collisions, however, facilities may be narrow given Collector Street 8 supports the Transit Hub (intensification area)
Transit Serviceability	Accommodates future transit infrastructure	●	• Roadway can accommodate future transit route	●	• Roadway can accommodate future transit route	○	• Roadway cannot accommodate future transit route	
	Ability to implement alternative adaptable options for changing options in transit service provision (e.g., automated vehicles, mobility-as-a-service)	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision • Four-lane roadway provides flexibility to be converted to implement alternative options for changing options in transit service provision	◑	• Landscaped/utilities area can be converted to implement alternative options for changing option in transit service provision • Four-lane roadway provides flexibility to be converted to implement alternative options for changing options in transit service provision	○	• Roadway cannot accommodate future transit route	
	Sub-Category Assessment	◕		◕		○		From a transit serviceability perspective, **Alternatives C8-MA1 and C8-MA2** are preferred equally for the following reasons: • Can accommodate future transit route and there are areas available to be converted into alternative options for changing option in transit service provisions
Supports Active Transportation	Provides sufficient space to accommodate active transportation facilities	◑	• Provides multi-use paths or side-by-side facilities with a width of 3.2 m	◔	• Multi-use path provides shared facility for pedestrians and cyclists totalling 3.5 m • The MUP would need to be shared with two-way cyclists and pedestrians which may increase potential conflicts	◑	• Provides 1.5m cycle track width • Provides 1.5 m sidewalks which meets City's current requirements, however, may be narrow given the area by Transit Hub will be a more intensified area • Provides minimum required sidewalk/bike lane widths which	

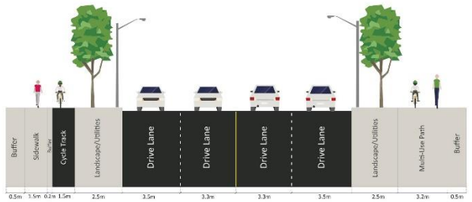
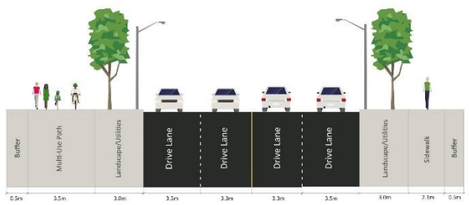
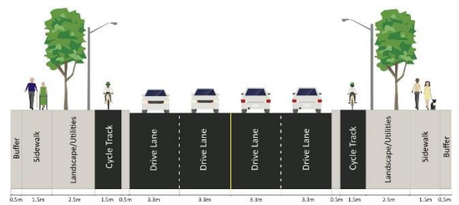
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
							meet City of Vaughan requirements Engineering Design Criteria & Standard Drawings (Dec 2020)	
	Opportunities to include enhanced safety features (e.g. separated/wider clearways) and comfortable for all users (e.g. slopes)	◑	• Pedestrians and cyclists share multi-use path of 3.2 m • MUPs are potentially less safe for pedestrians due to potential collisions with cyclists • Provision of side-by-side facility of 3.2 m which may reduce collisions and enhance safety	◑	• Pedestrians and cyclists share a multi-use path of 3.5 m on one side which is less safe for pedestrians due to potential collisions with cyclists, however, wide MUP provides opportunities to implement enhanced safety features but will not off-set increased conflicts of two-way cyclists • Two-way cyclists must share the same MUP with pedestrians, which can result in more conflicts versus MA1 • 2.1 m sidewalk on other side	◑	• Pedestrians are separated on 1.5 m sidewalks • Cycle track is 1.5 m with a buffer of 0.5 m	
	Sub-Category Assessment	◑		◔		◑		From an active transportation perspective, **Alternatives C8-MA1 and C8-MA3** are equally preferred for the following reasons: • Alternative C8-MA1 provides a wider MUP/side-by-side facilities, however, the shared/side-by-side facilities in a high intensification area (Transit Hub) may result in more collisions • Alternative C8-MA3 provides separated facilities, however, facilities are narrower (but meet City standards) which may also result in more collisions • Provides minimum required sidewalk/bike lane widths which meet City of Vaughan requirements Engineering Design Criteria & Standard Drawings (Dec 2020)
Road Capacity	Provide sufficient road capacity for the projected traffic needs	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing	●	• Provides sufficient road capacity for projected traffic needs • No excess capacity can be accommodated without removing	

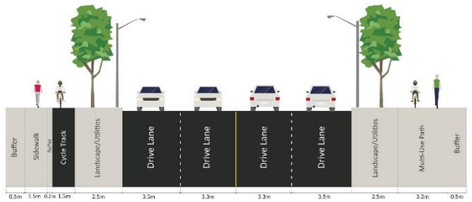
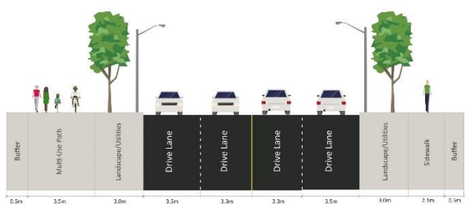
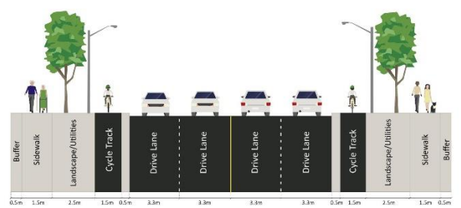
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
			 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			landscaping/utility area or removing the bike lanes		landscaping/utility area or removing multi-use path		landscaping/utility area or removing the bike lanes	
	Sub-Category Assessment							**All Alternatives are** preferred equally from a road capacity perspective for the following reasons: • All alternatives provide sufficient road capacity for projected traffic needs, however, any excess capacity that may be required in the future cannot be accommodated without the removal of landscape/utility area or removing active transportation facilities
Design Standard Compliance	Compliance with City and Regional design standards		• Meets Vaughan TMP recommended lane and facility widths and anticipated future required facility widths		• Meets Vaughan TMP recommended lane and facility widths • Does not provide cycling facilities on one side of the roadway • City of Vaughan does not have a single-sided multi-use path standard cross-section • Provides 2.1 m sidewalks which meet the City's future sidewalk width requirements		• Meets Vaughan TMP recommended lane and facility widths • Provides 1.5 m sidewalks which does not meet the City's future anticipated sidewalk width requirements • City of Vaughan does not have a uni-directional cycle track standard cross-section • City of Vaughan prefers the implementation of uni-directional cycle tracks across Vaughan • Road widths cannot accommodate transit	
	Meets accessibility standards (AODA)		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.2 m multi-use path or side-by-side facilities is provided for pedestrians and cyclists		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 3.5 m multi-use path is provided for pedestrians and cyclists on one side • 2.1 m sidewalks are provided which meet the City's desired 2.0 m sidewalk width for intensification areas		• Sidewalks will be designed per AODA (e.g., cross-slopes) • AODA ramps or drop curbs can be accommodated at pedestrian crossings • 1.5 m sidewalks are provided which meet AODA's minimum requirements	
	Flexibility to accommodate future designs (i.e., implementation of adjacent studies)		• MUP/side-by-side facilities and landscaped area could be used to accommodate future design		• MUP/sidewalk, and landscaped area could be used to accommodate future design		• Cycle track and landscaped area could be used to accommodate future design	

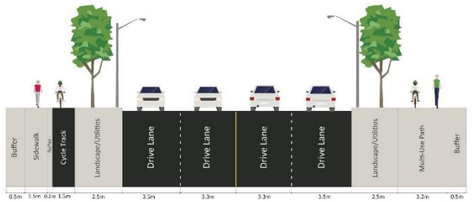
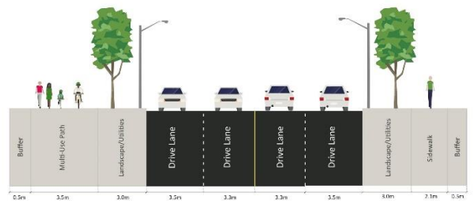
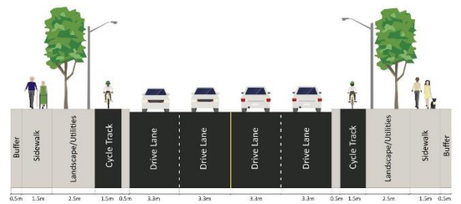
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			• One sided MUP and lack of a cycling facility on the other side may be more challenging to accommodate future designs / adjacent studies					
	Sub-Category Assessment		◕		◑		◑	From a design standard compliance perspective, **Alternatives C8-MA1** was preferred for the following reasons: • Meets Vaughan TMP recommended lane and facility widths and anticipated future required sidewalk widths
Community Connectivity	Provides enhanced connections to major destinations for all modes	◕	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • MUPs provide flexibility to connect with other cycle facilities on connecting roadways	◑	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • Does not provide connection for cyclists on one side of the road	◕	• Provides enhanced connections for vehicles, pedestrians and cyclists to reach major destinations • In-boulevard uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways • Road width cannot accommodate transit vehicles	
	Sub-Category Assessment		◕		◑		◔	From a community connectivity perspective, **Alternatives C8-MA1** is preferred for the following reasons: • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block
Promotes High Quality and Sustainable Public Realm	Provides for safe and continuous active transportation (walk, cycling)	●	• Alternative provides shared pedestrian and cyclist facilities • Side-by-side facilities/MUPs provide flexibility to connect with other cycle facilities on connecting roadways	◑	• Alternative provides shared pedestrian and cyclist facilities • Does not provide cycling facilities on one side of the road and the lack of connection may be disruptive to cyclists and require a detour • MUP provide flexibility to connect with other cycle facilities on connecting roadways	●	• Alternatives provides separate facilities for pedestrians and cyclists • Uni-directional cyclist tracks provide flexibility to connect with other cycle facilities on connecting roadways	
	Supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports an accessible network for all ages and abilities	◑	• Roadway and active transportation facilities supports an accessible network for all ages and abilities	◕	• Roadway and active transportation facilities supports an accessible network for all ages and abilities	

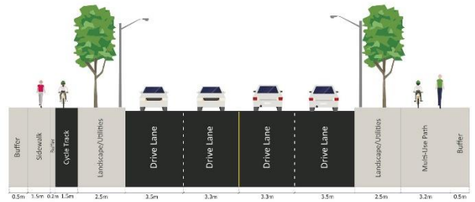
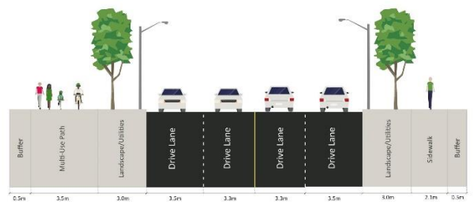
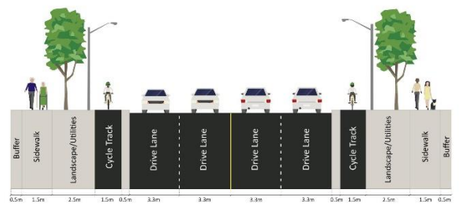
Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP	Alternative C8 – MA2 Multi-Use Path (single sided)	Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks	Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)			
	• Cyclists and pedestrians could be separated via a side-by-side facility which decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	• Cyclists and pedestrians could be separated with decreases the risk of a potential collision • Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	• Longer distance curb to curb for pedestrians to navigate; street is considered safer to cross	
	Allows for streetscape / street furniture to enhance user experience	• Wide landscape features provide opportunities for street furniture	• Wide landscape features provide opportunities for street furniture	• Wide landscape features provide opportunities for street furniture	
	Sub-Category Assessment				From a quality and sustainable public realm perspective, **Alternatives C8-MA1 and C8-MA3** are equally preferred for the following reasons: • Both alternatives have the ability to provide separated pedestrian and cyclist facilities which provide flexibility to connect with other cycle facilities on connecting roadways • Roadway and active transportation facilities supports an accessible network for all ages and abilities • Wide landscape features provide opportunities for street furniture
Overall Category Ranking					**Alternatives C8-MA1** is the preferred cross-sections from a Transportation perspective for the following reasons: • Achieve complete street principles and provides adequate infrastructure for all road users and meets City of Vaughan current and proposed future design standards • Pedestrians and cyclists are separated from vehicular traffic • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block

Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
								• Provides wider facility widths which meet the City's anticipated future required facility widths
Socio-Economic Environment								
Supports Surrounding Land-Uses	Conforms with land-use policy objectives	●	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4). • Opportunity to accommodate bus service (VOP 4.2.1.24) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed. Class 1 facilities (buffered/protected cycle track) are recommended roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	◔	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Conforms to policy objectives by prioritizing active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a landscape/tree buffer between bike/pedestrian travel lanes and moving traffic (Growth Plan 3.2.3.4). • Compared to MA-1, the lack of MUP on one side of the street has the opportunity to decrease the comfort and ease of use for cyclists accessing both the north and south mixed-use areas along Collector Street 2 as it will require additional maneuvering through intersections to turnaround • Opportunity to accommodate bus service (VOP 4.2.1.24) • Does not aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) because cycling facility are not provided on both sides of the road which is a requirement for major collector roads per the Master Plan	○	• Conforms to policy objectives by providing for a multi-modal transportation system including pedestrian and cycling facilities (PPS 1.6.7.3) • Generally conforms to policy objectives of encouraging active transportation by providing for a dedicated lane space for bicyclists on the major street network and helping to promote safe, comfortable travel for cyclists and pedestrians through the use of a vertically separated bike lane (Growth Plan 3.2.3.4). • Does not accommodate bus service and is not transit supportive which is an objective in the VOP (VOP 4.2.1.24) and Block 27 Secondary Plan (Transit Orientated Community) • Aligns with City's Pedestrian and Bicycle Master Plan (Dec 2020) as a class 1 facility is proposed (i.e., physically (i.e., vertically) separated bike lane with 0.5 m buffer) which is recommended for roadways with speeds higher than 40 km/hr (Table 5-1 of the Master Plan)	
	Supports surrounding land-uses	◑	• Side-by-side facilities/MUPs provide less favourable condition compared	◔	• MUPs provide less favourable condition compared to Alternative	◔	• Raised and buffered cycle tracks will encourage active forms of	

Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
			to Alternative C8-MA3 (separated uni-directional cycle tracks) given the mid-rise residential and mid-rise mixed-use land uses along both sides of Collector Street 8 and driveways • Dedicated cycling facilities buffered via landscaping supports land uses and built forms by encourages safe, active modes of transportation to access mixed use areas • Allow cyclists to access both sides of the roadway		C8-MA3 (separated uni-directional cycle tracks) given the mid-rise residential and mid-rise mixed-use land uses along both sides of Collector Street 8 and driveways, • The lack of cycling facilities on one side of the street decreases the convenience, comfort and ease of use for cyclists accessing both the north and south mixed-use areas along Collector Street 8 as it will either require additional maneuvering through intersections to turnaround or require cyclists to cycle on-street • The multi-use path helps to encourage active forms of transportation to support mixed use areas along one side of Collector Road 8. • The multi-use path on one side of the street is more supportive of the residential uses. Having the MUP on only one side of the street reduces the number of conflicts between vehicles and users of the MUP than if the MUP was provided on both sides of the street		transportation to support mixed use areas along Collector Road 8 • Uni-directional cycle tracks allow cyclists to access both sides of the roadway • Sidewalks and cycle tracks are narrow given Street 8's connection with The Transit Hub (intensified area) • Uni-directional cycling facilities are favourable given mid-rise residential and mid-rise mixed-uses along both sides of Collector Street 8 • Does not accommodate transit vehicles to support the transit orientated community and support connectivity to the Kirby GO Station	
	Encourages aesthetic and adheres to urban design principles		• Provides for street trees which improves aesthetics • High amount of pavement dedicated to vehicle lanes which reduces the aesthetics • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics		• Provides for street trees which improves aesthetics • Lowest amount of continuous pavement which improves aesthetics and increases opportunity for more landscaping • Pedestrian and cycling facilities buffered via landscaping from vehicle travel lanes which increases aesthetics		• Provides for street trees which improves aesthetics • High continuous amount of pavement which decreases aesthetics	
	Sub-Category Assessment							**Alternative C8-MA1** is preferred from a land-use policy compliance perspective for the following reasons:

Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)						• Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics
Climate Change	Ability to address climate change	◑	• Moderate imperviousness, moderate chance to address climate change	◑	• Moderate imperviousness, moderate chance to address climate change	◑	• Moderate imperviousness, moderate chance to address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Ability to implement emerging technologies and climate change initiatives	◑	• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	◑	• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	◑	• Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change	• Space constraint and potential location for LIDs as well as the run-off volume are parameters in these rationales.
	Sub-Category Assessment		◑		◑		◑	**All Alternatives** are equally preferred from a climate change perspective for the following reasons: • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
Overall Category Ranking			◕		◑		◔	**Alternatives C8-MA1** is the preferred cross-section from an overall socio-economic environment perspective for the following reasons: • Conforms with City of Vaughan land-use policy objectives and Block 27 Secondary Plan (Transit Orientated Community), providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway

Evaluation Criteria		Alternative C8 – MA1 Side-by-Side Facilities/MUP		Alternative C8 – MA2 Multi-Use Path (single sided)		Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks		Comments / Rationale
		 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)					
								• Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change
Cost & Constructability								
Engineering Feasibility, Capital, Operational, and Maintenance Cost	Ease of Construction	●	• Construction of roadway with MUP is standard and construction is not anticipated to be complex • Second largest boulevard width which will provide increased feasibility for LIDs	●	• Construction of MUP and sidewalks are standard and construction is not anticipated to be complex • LID can be easily implemented within the landscape area adjacent to the pavement • More room for utilities	◕	• Construction of roadway in boulevard raised and buffered cycle tracks is standard within the City of Vaughan and construction is not anticipated to be complex • The placement of the cycle tracks complicates the implementation of LIDs as they obstruct/ interfere with the potential connection of catch basins to LIDs underneath the landscape area • Smallest boulevard width which will provide decreased feasibility for LIDs	
	Scale of Capital Costs	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	◑	• Construction costs for the road are anticipated to be similar	
	Operating and Maintenance Costs	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	◑	• Operating and maintenance costs are anticipated to be similar	
Overall Category Ranking		◑		◑		◑		**All Alternatives** are equally preferred cross-sections from an overall cost & constructability perspective for the following reasons: • Construction of roadway with uni-directional cycling facilities / MUP / side-by-side facilities are standard within the City of Vaughan and construction is not anticipated to be complex

Evaluation Criteria	Alternative C8 – MA1 Side-by-Side Facilities/MUP	Alternative C8 – MA2 Multi-Use Path (single sided)	Alternative C8 – MA3 Separated Uni-Directional Cycle Tracks	Comments / Rationale
	 **Note**: This alternative considers implementation of MUP(s) and/or side-by-side facilities (both are illustrated in the above cross-section as an example)	 	 	• Capital, operational, and maintenance costs are anticipated to be similar
OVERALL EVALUATION	◕	◑	◑	**Alternative C8-MA1 was selected as the preferred Street 8 cross-section alternative for the following reasons:** • Achieves complete street principles and provides sufficient infrastructure for all road users and meet the City's design standards • Pedestrians and cyclists are separated from vehicular traffic • Provide flexibility to connect with all other active transportation facilities on connecting roadways • Accommodates transit vehicles to enhance connectivity to adjacent blocks and within the block and as a transit orientated community • Provides wider facility widths which meet the City's anticipated future required facility widths • Conforms with City of Vaughan land-use policy objectives, providing both active transportation and transit supportive infrastructure • Pedestrian and cycling facilities on both sides provides access both sides of the roadway • Provides for street trees which improves aesthetics • Moderate imperviousness, moderate chance to address climate change • Moderate landscape width, resulting in moderate opportunity to implement LIDs and trees to address climate change