

York Region - Teston Road Area Improvements IEA - Evaluation of Alternatives to the Undertaking

Per the MECP Code of Practice for undertaking Environmental Assessments, the principles to be followed to ensure good environmental planning are transparency, traceability, and replicability. Evaluations also need to consider consultation with stakeholders, including the public and indigenous communities.

To determine the preferred Alternative to the Undertaking an evaluation process will be undertaken. The IEA's Terms of Reference determined that a Reasoned Argument method would be undertaken to evaluate the alternatives. Additionally, the Terms of Reference provided a set of evaluation criteria which describe the features/considerations that will be accounted for during the evaluation process.

CRITERIA	FEATURES / CONSIDERATIONS
Natural Environment	<p>The degree to which the proposed transportation system modification has the potential to impacts natural features, species of conservation concern, and SAR, such as: aquatic ecosystems, terrestrial ecosystems, groundwater, surface water and source water.</p> <p>The degree to which the proposed transportation system modification supports federal, provincial, municipal and conservation authority environmental protection policies and guidelines.</p>
Socio-Economic Environment	<p>The degree to which the proposed transportation system modification supports:</p> <ul style="list-style-type: none"> • existing and planned future land use and growth including recognition of growth management plans and policies as articulated in provincial policies and municipal OPs and regulatory requirements for the perpetual care and control of closed landfills. • provincial, regional, and municipal economy including manufacturing and trade; tourism and recreation; and agriculture. <p>The degree to which the proposed system modification impacts features such as communities, resources, air quality, noise etc.</p>
Cultural Environment	<p>The degree to which the proposed transportation system modification impacts cultural features, such as:</p> <ul style="list-style-type: none"> • properties of cultural heritage value, including archaeological sites, built heritage resources and cultural heritage landscapes. • Indigenous sites.
Transportation	<p>The degree to which the proposed transportation system modification:</p> <ul style="list-style-type: none"> • supports federal/provincial/municipal transportation policies/goals/objectives. • improves system capacity & efficiency for the movement of people and goods. • improves system capacity & efficiency to reduce growth in peak travel demand. • makes effective and efficient use of the existing road and transit system using Transportation Demand Management and Transportation System Management strategies. • improves system reliability and redundancy during adverse conditions. • improves traffic safety through congestion reduction. • enhances goods movement by linking communities within the York Region. • improves mobility and accessibility through enhanced modal integration/choice for a more balanced transportation system.

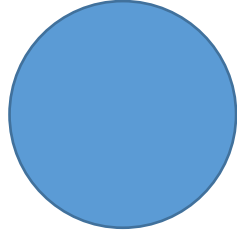



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	Factor	Sub Factor and Measure	Alternative 1: Do Nothing 2041 TMP Network, excl. Teston Road (Keele Street to Dufferin Street)	Alternative 2: New Ped/Cycling Crossing and Widen Kirby to 6 Lanes (Bathurst Street to Hwy. 400) with 1 new HOV Lane/Direction	Alternative 3: New Pedestrian/Cycling Crossing and Widen Kirby Road and Keele Street by 1 new General Purpose Lane / Direction	Alternative 4: New 4 lane Teston Road Extension (incl. Pedestrian/Cycling Facilities)
1.0 - Natural Environment	1.1 Fish and Fish Habitat	1.1.1 Fish and Fish Habitat Measure: Assessed on the presence of watercourses and potential for Species at Risk presence.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED This alternative would require road widening at one crossing of the Don River West Branch, one crossing of the Don River East Branch and at two crossings of the Humber River East tributaries. Widening existing crossings has the potential to cause permanent loss of fish habitat but avoidance is possible through design. The Don Valley River is noted as being suitable habitat for Redside Dace, a protected species.	MODERATELY PREFERRED This alternative would require road widening at one crossing of the Don River West Branch. Widening an existing crossing has the potential to cause permanent loss of fish habitat but avoidance is possible through design. The Don Valley River is noted as being suitable habitat for Redside Dace, a protected species.	MODERATELY PREFERRED This alternative would require a new crossing of the Don Valley River East Branch tributary. A new structure crossing the valley would likely have large piers with foundations, which may cause a permanent loss of fish habitat if placed in areas below the high-water mark. Design can likely be adjusted to avoid these impacts. The Don Valley River is noted as being suitable habitat for Redside Dace, a protected species.
	1.2 Terrestrial Ecosystems	1.2.1 Wildlife and Habitat Measure: Assessed on the presence of, or habitat for, Species at Risk and known wildlife usage.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED The Oak Ridges Moraine provides healthy and diverse plant and animal habitat. This alternative would require widening of Kirby Road through a long portion of Natural Core Areas as well as some Natural Linkage Areas, which will require tree removals and a permanent loss of natural area. Several SAR species were observed during field investigations in Natural Core Areas within the Study Area.	MODERATELY PREFERRED The Oak Ridges Moraine provides healthy and diverse plant and animal habitat. This alternative would require widening of Kirby Road through a short portion of Natural Core Area as well as along the edge of some Natural Linkage Area, which will require tree removals and a permanent loss of natural area. Several SAR species were observed during field investigations in Natural Core Areas within the Study Area.	LEAST PREFERRED The Oak Ridges Moraine provides healthy and diverse plant and animal habitat. This alternative would require impacts to Natural Core Area not previously impacted by roadways, thus impacting wildlife habitat. The areas of impact would include bridge abutments and piers, which will require tree removals and a permanent loss of natural area. Several SAR species were observed during field investigations in Natural Core Areas within the Study Area.
		1.2.2 Wetlands Measure: Assessed on the presence of Provincially Significant wetlands.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	MODERATELY PREFERRED A Provincially Significant Wetland is present between Dufferin Street and Bathurst Street. This alternative would require widening through the wetlands, which may cause a permanent loss of wetland habitat.	MOST PREFERRED This alternative would not impact any provincially significant wetlands.	LEAST PREFERRED Provincially significant wetlands are present between Keele Street and Dufferin Street. This alternative would require crossing these wetlands, which may cause a permanent loss of wetland habitat. Spanning over the wetlands will be possible.
		1.2.3 Designated/ Special/Natural Areas Measure: Assessed on the presence of areas that are designated, of	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED This alternative will require widening of existing infrastructure that passes through Areas of Natural and Scientific Interest (ANSI), the Oak Ridges Moraine, and the Greenbelt, so this	MODERATELY PREFERRED This alternative will require widening of existing infrastructure that passes through Areas of Natural and Scientific Interest (ANSI), the Oak Ridges Moraine, and the Greenbelt, so this	MODERATELY PREFERRED This alternative would require new infrastructure to pass through Areas of Natural and Scientific Interest (ANSI), the Oak Ridges Moraine, and the Greenbelt, so this alternative will cause

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	special interest, or provided other protections.		alternative will cause some permanent loss of these natural features. Given the length of road embankment widening this alternative has the largest impact.	alternative will cause some permanent loss of these natural features. Given the length of road embankment widening required this alternative has a moderate impact.	some permanent loss of these natural features although some of this is likely localized in the areas of the bridge piers and abutments. Even at the narrowest area, it is not likely feasible to span over these areas with a structure.
1.3 Landfills / Contaminated Properties	1.3.1 Existing Landfills Measure: Assessed on the risk of impacts to the nearby landfills.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	MOST PREFERRED Roadway widening would not impact landfills. A pedestrian/cyclist crossing between Keele Street and Dufferin Street may encroach on one or all the landfills in the area, however, there is likely sufficient design flexibility to be able to avoid conflict with the landfills.	MODERATELY PREFERRED Roadway widening would not impact landfills. A pedestrian/cyclist crossing between Keele Street and Dufferin Street may encroach on one or more of the landfills in the area, however, there is likely sufficient design flexibility to be able to avoid significant conflict with the landfills.	LEAST PREFERRED This alternative would encroach on and potentially conflict with the Keele Valley Landfill, Town of Vaughan Landfill, and/or former Waste Disposal Services Landfill. Design alternatives can likely help avoid significant impacts.
	1.3.2 Contaminated Properties Measure: Assessed based on the potential to impact contaminated properties.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	MODERATELY PREFERRED This alternative could impact 2 areas of potential environmental concern at the Kirby Road/Keele Street intersection.	MODERATELY PREFERRED This alternative could impact 4 areas of potential environmental concern including the Keele Street/Teston Road industrial park, and facilities at the Kirby Road/Keele Street intersection.	LEAST PREFERRED This alternative could impact 2 areas of potential environmental concern including the Keele Street/Teston Road industrial park and the previous landfill uses throughout the area.
1.4 Air Quality	1.4.1 Air Quality Measure: Local and regional air quality impacts	LEAST PREFERRED The Do Nothing alternative may contribute more to emissions as increased congestions causes more idling of vehicles.	MODERATELY PREFERRED This alternative would somewhat alleviate traffic congestion for east-west travellers through the study area which would result in fewer emissions than the Do Nothing option but would still result in a 6 km detour for travellers looking to travel east-west along Teston Road with some travel diverting further to the north and south due to congestion. If implemented as an HOV+EV Lane, its emissions performance could be even better.	LEAST PREFERRED While this alternative would somewhat alleviate traffic congestion by providing localized additional capacity, it would result in a 6 km detour for travellers looking to travel east-west along Teston Road with some travel diverting further to the north and south due to congestion. The additional distance travelled would result in more emissions.	MOST PREFERRED This alternative would alleviate traffic congestion and result in a more direct route for travels using Teston Road, this would result in fewer emissions.
1.5 Climate Change	1.5.1 Greenhouse Gases Measure: A comparative estimate of the project's maximum annual net GHG emissions.	MODERATELY PREFERRED The Do Nothing alternative may contribute more to GHG emissions as increased congestions causes more idling of vehicles. However, as there is no additional construction required	MODERATELY PREFERRED This alternative would somewhat alleviate traffic congestion for east-west travellers through the study area which would result in fewer GHG emissions than the Do Nothing option	MODERATELY PREFERRED While this alternative would somewhat alleviate traffic congestion by providing additional capacity, it would result in a 6 km detour for travellers looking to travel east-west along Teston Road. The	MODERATELY PREFERRED This alternative would alleviate traffic congestion and result in a more direct route for travels using Teston Road, this would result in fewer GHG emissions.




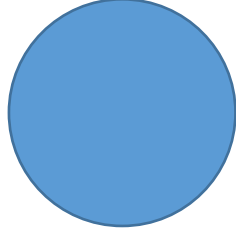
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		under the Do Nothing alternative, contributions to GHGs because of construction material and equipment would not occur.	but would still result in a 6 km detour for travellers looking to travel east-west along Teston Road. If implemented as an HOV+EV Lane, its GHG performance could be even better. A large amount of material and construction is required to widening Kirby Road, resulting in GHG emissions from construction.	additional distance travelled would result in more GHG emissions. The amount of construction for this alternative is lower than other options, resulting in lower GHG emissions related to construction material and equipment.	As this alternative requires a whole new road to be constructed and two large structures, it requires the most amount of materials and construction equipment, thus resulting in higher GHG emissions from construction.
	1.5.2 Carbon Sinks Measure: Comparative evaluation of impact on carbon sinks (forests, wetlands, etc.). over the course of the project lifetime.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED This alternative would have a large impact on carbon sinks as the road widening would remove areas of forest and wetlands.	MODERATELY PREFERRED This alternative would have some impact on carbon sinks as the road widening would remove some areas of forest.	MODERATELY PREFERRED This alternative would have impacts to carbon sinks but less than that of Alternative 6M. While wetlands may be spannable via a bridge, forested areas would need to be removed for this alternative.
1.0 - Natural Environment Summary		MOST PREFERRED The Do Nothing alternative is provided for comparison. It generally has lower impacts under Natural Environment except under Air Quality and GHG emissions related to congestion.	LEAST PREFERRED While this alternative does not impact landfills and has the least impact on contaminated sites, it does require widening through the longest portion of Oak Ridges Moraine area, impacts to wetlands and impacts several watercourse crossings.	MODERATELY PREFERRED This alternative impacts the shortest portion of Oak Ridges Moraine and requires widening of only 1 crossing of the Don River.	LEAST PREFERRED This alternative requires a new crossing of the Don River, has the most potential impact on landfill sites, would impact Natural Core areas within the Oak Ridges Moraine and areas of wetlands and ANSI.
					

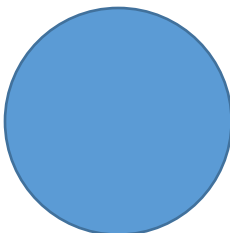



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2.0 - Socio-Economic Environment	2.1 Land Use	2.1.1 Provincial land use planning Measure: Assessing the ability of the alternative to support provincial land use planning policies.	LEAST PREFERRED This alternative would result in a transportation network that does not meet the current and projected needs of the province and therefore does not support the policies within the Provincial Policy Statement (Sections 1.1.1(g) and 1.6.1(b)) or the Growth Plan for the Greater Golden Horseshoe, (Section 3).	MODERATELY PREFERRED This alternative would result in improvements to the transportation network that works towards meeting the current and projected needs of the province but falls short of addressing some aspects of provincial policies, such as connectivity, reducing emissions and a safe network for users. This IEA and the evaluation of alternatives supports requirements for infrastructure development within the Oak Ridges Moraine.	LEAST PREFERRED This alternative would result in modest improvements to the transportation network with limited contribution towards meeting the current and projected needs of the province. This IEA and the evaluation of alternatives supports requirements for infrastructure development within the Oak Ridges Moraine.	MOST PREFERRED This alternative would result in improvements to the transportation network that meets current and projected needs of the province. It also addresses connectivity, reduction of emissions, and increased safety of the network. This IEA and the evaluation of alternatives supports requirements for infrastructure development within the Oak Ridges Moraine.
		2.1.2 Regional policies and Municipal land use planning Measure: Assessing the ability of the alternative to support regional policies and municipal land use planning.	LEAST PREFERRED This alternative would result in a transportation network that does not support objectives of regional policies and municipal land use planning.	MODERATELY PREFERRED This alternative would meet some of the objectives of regional policies, however, they do not fully address objectives for connectivity or building missing links. This alternative only partly supports regional and municipal land use plans.	LEAST PREFERRED This alternative would meet some of the objectives of regional policies, however, it does not address objectives for connectivity, building missing links, or connectivity to 400-series highways. This alternative does little to support regional and municipal land use plans.	MOST PREFERRED This alternative meets many objectives of regional policies and supports regional and municipal land use plans.
		2.1.3 Local Development Measure: Assess the impact of the alternative on planned developments.	LEAST PREFERRED The Do Nothing alternative does not address the local transportation mobility and access needs for all modes of travel within the study area and therefore has a potentially negative impact on local development.	MODERATELY PREFERRED Widening of Kirby Road would have minor implications for a planned subdivision in the southeast quadrant of Kirby Road and Dufferin Street. This alternative partially addresses local transportation mobility and access needs within the study area and therefore partially supports local development plans.	MODERATELY PREFERRED This alternative would not impact developments. This alternative partially addresses local transportation mobility and access needs within the study area and therefore partially supports local development plans.	MOST PREFERRED This alternative may have some impact on property access in the area of the GO line crossing and may affect potential future redevelopment of these lands. This alternative best addresses the local transportation mobility and access needs for all modes of travel within the study area and therefore best supports local development plans.
	2.2 Noise	2.2.1 Transportation Noise Measure: Types of potential noise impacts on sensitive receptors and decreases in proximity to noise receptors.	LEAST PREFERRED Without addressing the Teston Road discontinuity many travelers will continue to divert to the north or south past noise sensitive areas to access local destinations west or east of the Don River valley.	LEAST PREFERRED Without addressing the Teston Road discontinuity many travelers will continue to divert to the north or south past noise sensitive areas to access local destinations west or east of the Don River valley.	LEAST PREFERRED Without addressing the Teston Road discontinuity many travelers will continue to divert to the north or south past noise sensitive areas to access local destinations west or east of the Don River valley.	MOST PREFERRED This alternative would result in a small number of sensitive receptors that are currently set back from roadways to be closer to noise generating transportation infrastructure, however, generally the alternative would result in less impact to noise sensitive areas.

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2.3 Economic Activities	2.3.1 Contribution to regional and municipal economy Measure: Benefit to manufacturing and trade; tourism and recreation; and agricultural industries.	<p>LEAST PREFERRED</p> <p>This alternative does not reduce travel time for any modes of travel, does not increase transportation network capacity and does not remove the existing travel discontinuity between Dufferin Street and Keele Street. Therefore, it does not increase the movement of goods and people and does not provide any benefit to local/regional economies.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative partially increases the movement of goods and people through some increased transportation network capacity and so it has some benefit to local/regional economies.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative partially increases the movement of goods and people through some increased transportation network capacity and so it has some benefit to local/regional economies.</p>	<p>MOST PREFERRED</p> <p>This alternative increases the movement of goods and people through increased transportation network capacity and so it has the most benefit to local/regional economies.</p>
2.0 - Socio-Economic Environment Summary		<p>LEAST PREFERRED</p> <p>The Do Nothing alternative generally has lower physical impacts under Socio-Economic Environment but it does not fully support regional/local land use plans.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative does not have significant impacts to the Socio-Economic Environment; however, it is generally less aligned with Provincial, Regional, and Municipal policies/planning.</p>	<p>LEAST PREFERRED</p> <p>This alternative does not have significant impacts to the Socio-Economic Environment; however, it is generally less aligned with Provincial, Regional, and Municipal policies/planning.</p>	<p>MOST PREFERRED</p> <p>This alternative has the least impacts to the Socio-Economic Environment including having the least impacts on noise and local developments. It also supports provincial, regional, and municipal policies/planning.</p>
					

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3.0 Cultural Environment	3.1 Cultural Heritage Resources	3.1.1 Built Heritage/Cultural Heritage Landscapes Measure: Resources (i.e., heritage buildings, cemeteries, etc.) potentially impacted by the alternative.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED The alternative would have impacts to eight identified cultural heritage resources.	LEAST PREFERRED The alternative would have impacts to six identified cultural heritage resources.	MODERATELY PREFERRED The alternative would have impacts to two identified cultural heritage resources.
		3.1.2 Archaeological Resources Measure: Impacts to undisturbed areas and/or proximity to areas of archaeological potential.	MOST PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	LEAST PREFERRED Given the extent of the Kirby Road widening this alternative would have the greatest impacts on undisturbed areas of archaeological potential.	MODERATELY PREFERRED This alternative has a moderate amount of impact on undisturbed areas of archaeological potential.	MOST PREFERRED This alternative would have relatively low impacts on undisturbed areas of archaeological potential.
		3.1.3 Indigenous Sites Measure: Impacts to known Indigenous Sites	MODERATELY PREFERRED All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts because of the Do Nothing alternative.	MODERATELY PREFERRED There are no known indigenous sites impacted by this project, however, further investigations are needed once a preferred alternative.	MODERATELY PREFERRED There are no known indigenous sites impacted by this project, however, further investigations are needed once a preferred alternative.	MODERATELY PREFERRED There are no known indigenous sites impacted by this project, however, further investigations are needed once a preferred alternative.
3.0 - Cultural Environment Summary			MOST PREFERRED The Do Nothing alternative has low physical impacts under Cultural Environment.	LEAST PREFERRED This alternative has the highest impacts to identified cultural heritage resources and areas of archaeological potential.	LEAST PREFERRED This alternative has relatively higher impacts to identified cultural heritage resources and moderate impacts to areas of archaeological potential.	MODERATELY PREFERRED This alternative has relatively low impacts to identified cultural heritage resources and to areas of archaeological potential.
						




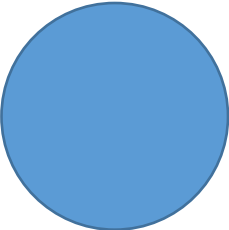
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4.0 Transportation	4.1 Planning and Design	3.1.1 TDM/TSM Measure: Makes effective and efficient use of the existing road and transit system using Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies.	All the short-listed Alternatives include a range of TDM and TSM measures and strategies as part of York Region's 2041 TMP network, plans and policies as well as other applicable provincial/municipal plans and policies. While neither TDM nor TSM were selected as stand-alone Alternatives they are considered important elements of all short-listed Alternatives and will contribute to addressing the identified study area problems and opportunities.			
	3.1.2 Enhanced Modal Integration Measure: Improves mobility and accessibility through enhanced modal integration/choice for a more balanced transportation system.	LEAST PREFERRED All the short-listed Alternatives include a range of multi-modal measures and strategies as part of York Region's 2041 TMP network, plans and policies as well as other applicable provincial/municipal plans and policies. While neither Transit nor Active Transportation were selected as stand-alone Alternatives, they are considered very important elements of all short-listed Alternatives and will contribute to addressing the identified study area problems and opportunities.	MOST PREFERRED A widened Kirby Road corridor provides enhanced mobility and accessibility across the northern part of the study area for all modes of travel and directly enhances access to the proposed Kirby GO Transit station and Highway 400 HOV Lanes. A new Active Transportation crossing (bridge) of the Don River would significantly improve pedestrian/cycling mobility and accessibility through the mid-part of the study area.	MODERATELY PREFERRED A widened Kirby Road and Keele Street provides some enhanced mobility and accessibility across the northern part of the study area for all modes of travel – but less so than Alternative 6M. A new Active Transportation crossing (bridge) of the Don River would significantly improve pedestrian/cycling mobility and accessibility through the mid-part of the study area.	MOST PREFERRED A new 4-lane Teston Road extension provides enhanced mobility and accessibility across the mid-part of the study area for all modes of travel.	
	3.1.3 Travel Demand Measure: Potential to accommodate 2041 peak hour peak direction east-west travel demand (vehicular traffic). Link (Corridor or Screenline) Volume to Capacity ratio (V/C) of York Region standard of 0.9 or better.	LEAST PREFERRED This alternative does not provide adequate capacity to address projected demand with both Kirby Road and MMD projected to be very congested between Dufferin Street and Keele Street (Screenline S2 at 1.15 V/C). Significant traffic diversion and out-of-way travel is expected to take place beyond the study area to King Vaughn Road and Rutherford Road.	MODERATELY PREFERRED This alternative does not provide adequate capacity to address projected demand with both Kirby Road and MMD projected to be congested to very congested between Dufferin Street and Keele Street (S2 at 1.01 V/C). Moderate traffic diversion and out-of-way travel is expected to take place beyond the Study Area to King Vaughn Road and Rutherford Road.	LEAST PREFERRED This alternative does not provide adequate capacity to address projected demand with both Kirby Road and MMD projected to be congested to very congested between Dufferin Street and Keele Street (S2 at 1.00 V/C). Traffic diversion and out-of-way travel is expected to take place beyond the Study Area to King Vaughn Road and Rutherford Road.	MOST PREFERRED This alternative provides adequate capacity to address projected demand with all three of Kirby Road, Teston Road and MMD projected to operate at or close to an acceptable level (S2 at V/C of 0.89). Little to no traffic diversion beyond the Study Area to the north or south.	
	3.1.4 Discontinuity Measure:	LEAST PREFERRED This alternative does not address the existing east-west travel discontinuity for vehicular traffic in the road network	LEAST PREFERRED This alternative does not address the existing east-west travel discontinuity for vehicular traffic in the road network	LEAST PREFERRED This alternative does not address the existing east-west travel discontinuity for vehicular traffic in the road network	MOST PREFERRED This alternative best addresses the existing east-west travel discontinuity	




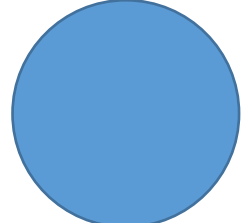
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	Assess the ability to address existing east-west travel discontinuity between Dufferin Street and Keele Street within the Study Area (vehicular traffic – autos, transit, goods movement, emergency vehicles).	between Dufferin Street and Keele Street within the Study Area.	between Dufferin Street and Keele Street within the Study Area.	between Dufferin Street and Keele Street within the Study Area.	for vehicular traffic in the road network.
	<p>3.1.5 Reduced Travel Time</p> <p>Measure: Assessed based on the ability to reduce travel time for both auto traffic and pedestrian/cycling usage.</p>	<p>LEAST PREFERRED</p> <p>This alternative does not reduce travel time for any modes of travel and does not increase transportation network capacity and does not remove the existing travel discontinuity between Dufferin Street and Keele Street.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative partially reduces travel time for all modes of travel through some increased transportation network capacity across the study area, however, levels of services at Kirby Road intersections will be decreased due to high volumes of left turn movements. This alternative removes the existing travel discontinuity between Dufferin Street and Keele Street for Active Transportation modes (Pedestrian/Cycling) only.</p>	<p>LEAST PREFERRED</p> <p>This alternative partially reduces travel time for all modes of travel through some increased localized transportation network capacity, however, levels of services at Kirby Road intersections will be decreased due to high volumes of left turn movements. This alternative removes the existing travel discontinuity between Dufferin Street and Keele Street for Active Transportation modes (Pedestrian/Cycling) only.</p>	<p>MOST PREFERRED</p> <p>This alternative best reduces travel time for all modes of travel through increased transportation network capacity and removal of the existing travel discontinuity between Dufferin Street and Keele Street.</p>
	<p>3.1.6 Safety</p> <p>Measure: Contribution to increased safety for Traffic, Pedestrians, and cyclists.</p> <p>Increased access for Emergency Services.</p>	<p>LEAST PREFERRED</p> <p>This alternative does not contribute to increased safety for vehicular traffic, pedestrians and cyclists and does not improve access for emergency services.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative partially contributes to increased safety for (in particular) pedestrians and cyclists and only partially improves access for emergency vehicles (due to some increased transportation network capacity). Decreased level of service and increased left turn movements reduces safety at intersections.</p>	<p>LEAST PREFERRED</p> <p>This alternative partially contributes to increased safety for (in particular) pedestrians and cyclists and only partially improves access for emergency vehicles (due to some increased transportation network capacity). Decreased level of service and increased left turn movements reduces safety at intersections.</p>	<p>MOST PREFERRED</p> <p>This alternative best contributes to increased safety for all modes of travel and best improves access for emergency vehicles.</p>

York Region - Teston Road Area Improvements IEA - Evaluation of Alternatives to the Undertaking

Factor	Sub Factor and Measure	Alternative 1: Do Nothing 2041 TMP Network, excl. Teston Road (Keele Street to Dufferin Street)	Alternative 2: New Ped/Cycling Crossing and Widen Kirby to 6 Lanes (Bathurst Street to Hwy. 400) with 1 new HOV Lane/Direction	Alternative 3: New Pedestrian/Cycling Crossing and Widen Kirby Road and Keele Street by 1 new General Purpose Lane / Direction	Alternative 4: New 4 lane Teston Road Extension (incl. Pedestrian/Cycling facilities)
	<p>3.1.7 Constructability</p> <p>Measure: Assessed on the complexity of construction, number of structures required (new or widened), and ability to comply with design criteria.</p>	<p>MOST PREFERRED</p> <p>All impacts from the Do Nothing alternative would occur in the other alternatives as well. Therefore, there are no additional impacts/complexities associated with the Do Nothing alternative.</p>	<p>MODERATELY PREFERRED</p> <p>Kirby Road widening (including a new GO line grade-separated crossing) can be completed with typical construction staging methods.</p> <p>A new Active Transportation crossing (bridge) of the Don River and existing landfill(s) would have moderate complexity.</p>	<p>MODERATELY PREFERRED</p> <p>Kirby Road and Keele Street widening (including an existing GO line grade-separated crossing) can be completed with typical construction staging methods.</p> <p>A new Active Transportation crossing (bridge) of the Don River and existing landfill(s) would have moderate complexity.</p>	<p>LEAST PREFERRED</p> <p>A new arterial roadway crossing (bridge) of the Don River and existing landfill(s) and new grade-separated GO line crossing would have relatively high construction complexity.</p>
4.0 - Transportation Summary		<p>LEAST PREFERRED</p> <p>The Do Nothing alternative is provided for comparison. It is the least preferred option in all Transportation factors as it does not address any problems or opportunities.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative does benefit the transportation network to some degree and provides improved mobility across the northern part of the study area. However, it falls short of addressing all transportation issues and further exacerbates problems at the Kirby Road intersections.</p>	<p>LEAST PREFERRED</p> <p>This alternative does benefit the transportation network to some degree however it falls short of addressing all transportation issues and further exacerbates problems at the Kirby Road intersections.</p>	<p>MOST PREFERRED</p> <p>While there is considerably more complexity to construct this alternative, it is the most preferred alternative in all other factors as it provides the most benefit to the transportation network and addressing problems and opportunities.</p>
					

York Region - Teston Road Area Improvements IEA - Evaluation of Alternatives to the Undertaking

	Alternative 1: Do Nothing 2041 TMP Network, excl. Teston Road (Keele Street to Dufferin Street)	Alternative 2: New Ped/Cycling Crossing and Widen Kirby to 6 Lanes (Bathurst Street to Hwy. 400) with 1 new HOV Lane/Direction	Alternative 3: New Pedestrian/Cycling Crossing and Widen Kirby Road and Keele Street by 1 new General Purpose Lane / Direction	Alternative 4: New 4 lane Teston Road Extension (incl. Pedestrian/Cycling facilities)
Evaluation Summary	Natural Environment – MOST Socio-Econ. Environment – LEAST Cultural Environment - MOST Transportation – LEAST	Natural Environment – LEAST Socio-Econ. Envnt.– MODERATELY Cultural Environment - LEAST Transportation – MODERATELY	Natural Environment – MODERATELY Socio-Econ. Environment – LEAST Cultural Environment - LEAST Transportation – LEAST	Natural Environment – LEAST Socio-Econ. Environment – MOST Cultural Environment - MODERATELY Transportation – MOST
	While the Do Nothing option is preferred because of its mostly low environmental impacts, it is least preferred for Socio-Economic and Transportation factors. Given the intent of this study is to address the problems and opportunities for the transportation network within the study area, this alternative is least preferred overall.	This alternative has somewhat higher Natural Environment impacts while addressing some transportation issues. It is least preferred under Cultural Environment.	While this alternative does not adequately address the Transportation factors it does have moderate impacts on the Natural Environment. It is least preferred under Socio-Economic and Cultural Environment factors.	This alternative best addresses all Transportation Environment factors and is most preferred for the Socio-Economic Environment factors. While it does have potentially higher impacts on the Natural Environment, these impacts can likely be greatly reduced during design and mitigations implemented to further reduce the impacts. This alternative would have a positive impact on the local economy.
	LEAST PREFERRED OVERALL	MODERATELY PREFERRED OVERALL	LEAST PREFERRED OVERALL	MOST PREFERRED OVERALL
				

York Region Teston Road Area Improvements IEA - Evaluation of Alternative Methods (Alignments)

November 2021

Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
1. NATURAL ENVIRONMENT								
1.1. Fisheries and Aquatic Ecosystems	1.1.1 Fish and Fish Habitat	<ul style="list-style-type: none"> • Degree of potential negative effect on fish habitat (e.g., size/scale/extent, duration, intensity/magnitude), considering sensitivity and relative quality and distribution of fish and fish habitat, e.g.: <ul style="list-style-type: none"> ○ direct presence of commercial, recreational or Aboriginal (CRA) fishery or relative contribution of fish or habitat to productivity of CRA fishery ○ species and/or habitat sensitivity to disturbance ○ species rarity, including species at risk (special concern, threatened or endangered fish species) ○ fish dependence on habitat and potential for effect to impact productivity (e.g. specialized / critical fish life stage processes like spawning, rearing, nursery, feeding) and fish movement/migration ○ fisheries/fish community management goals and objectives • Potential constraints/ issues/challenges to designing, constructing and mitigating crossing to avoid serious harm to fish (e.g., whether there are measures and standards to avoid, mitigate or offset serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or that support such a fishery). 	<p>MOST PREFERRED</p> <p>This alternative will have no impact on the Don River East tributary.</p>	<p>MODERATELY PREFERRED</p> <p>As all alternatives will require a new watercourse crossing, they will have a similar impact to fish and fish habitat. In order to mitigate the impacts, the valley crossing structure will need to have the longest span possible over the watercourse and its associated floodplain. The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts will be able to be mitigated through the design or with appropriate mitigation measures.</p>				

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
1.2 Terrestrial Ecosystems	1.2.1. Wildlife and Wildlife Habitat, including wildlife passage	<ul style="list-style-type: none"> Potential for and significance of encroachment, fragmentation, removal, long-term alteration / disruption as applicable to the following, and considering potential for impacts to individuals, species groups and/or populations and impacts to their respective habitats and movement among them: <ul style="list-style-type: none"> Habitat rarity (i.e., representation on the landscape) Habitat sensitivity / resilience Habitat diversity within feature and landscape Habitat function within feature and landscape Confirmed Significant Wildlife Habitat Potential Significant Wildlife Habitat Movement corridors and habitat connectivity Potential or confirmed habitat for Species at Risk Presence of Wildlife Species at Risk Interference with critical wildlife life stage processes (e.g., mating / rearing, etc.) Potential constraints and opportunities to design, construct, operate and mitigate the infrastructure to avoid or minimize impacts to wildlife and wildlife habitat. 	<p>MOST PREFERRED</p> <p>This alternative will have no impact on wildlife, wildlife habitat, and/or wildlife passage at this location.</p>	LESS PREFERRED	LESS PREFERRED	LESS PREFERRED	MODERATELY PREFERRED	LESS PREFERRED
	1.2.2. Wetlands	<ul style="list-style-type: none"> Potential for and significance of encroachment, fragmentation, removal and/or long-term alteration / disruption on wetland features as applicable to the following: 	<p>MOST PREFERRED</p> <p>This alternative will have no impact on the East Don River Headwater Wetland Complex.</p>	LESS PREFERRED Due to its proximity to open water/open aquatic and wetland communities, this alternative may have a	MODERATELY PREFERRED Due to its proximity to open water/open aquatic and wetland communities, this	LESS PREFERRED Due to its proximity to open water/open aquatic and wetland communities, this alternative may have a	MODERATELY PREFERRED Due to its proximity to open water/open aquatic and wetland communities, this	LESS PREFERRED Due to its proximity to open water/open aquatic and wetland communities, this alternative may have a

All alternatives may:

- Encroach into, fragment, and remove confirmed and potential habitat for Grassland Species at Risk: Bobolink (Threatened) and Eastern Meadowlark (Threatened), though this habitat is not rare in this area.
- Encroach into, fragment, and/or remove potential and confirmed habitat for numerous Special Concern Species at Risk (Wood Thrush, Eastern Wood-pewee, Monarch, and Snapping Turtle) as well as for numerous birds, mammals, and herptiles ranked as regionally rare (L2-L4) by the TRCA. Species ranked as L2-L4 are rare at the landscape level (or in urban areas for L4) and have high sensitivity and low resiliency (though less so for L4). Special Concern species are rare and are at risk of further decline, provincially.
- Permanently impact/alter/impair wildlife movement (primarily for mammals, amphibians, and reptiles), north to south, through grassland, forest, and wetland habitats.
- Impact/impair/remove/fragment several potential Significant Wildlife Habitats, including:
 - Encroach into, fragment, and remove potential roosting trees/forest habitat for Species at Risk Bats (Endangered); roost trees may also constitute Significant Wildlife Habitat
 - Waterfowl Stopover and Staging Areas (Aquatic), Waterfowl Nesting Areas, and Shorebird Migratory Stopover Areas
 - Raptor Wintering Areas and Woodland Raptor Nesting Areas
 - Bat Maternity Colonies
 - Turtle Wintering Areas and Turtle Nesting Areas
 - Colonially Nesting Bird Breeding Habitat (Tree/Shrub), Area-Sensitive Bird Breeding Habitat, and Open Country Bird Breeding Habitat
 - Rare Vegetation Communities
 - Amphibian Breeding Habitat (Wetlands and Woodlands)

Alternatives 4-A, 4-D, and 4-G may also result in impacts to/removal of abandoned buildings providing potential roosting habitat for Species at Risk Bats (Endangered) and potential nesting habitat for Species at Risk Barn Swallows (Threatened); abandoned buildings are rare on the landscape.

Alternative 4-E makes the most use of the existing footprint of Teston Road and the various access roads and driveway on the east and west ends.

The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		<ul style="list-style-type: none"> Provincially Significant Wetlands Non-provincially Significant Wetlands Un-evaluated wetlands Lands adjacent to wetland features required to maintain ecological features and functions Rarity, feature sensitivity/resilience (incl. hydrological functions/dependencies), feature diversity, size and representation on the landscape Opportunities to design, construct, operate and mitigate the alignment to avoid or minimize impacts to wetlands. 		<p>greater impact on these resources.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>alternative will have a lower impact on these resources.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>greater impact on these resources.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>alternative will have a lower impact on these resources.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>greater impact on these resources.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>
	1.2.3. Woodlands and other Vegetation including genetic connectivity of plans	<ul style="list-style-type: none"> Potential and significance of encroachment, fragmentation, removal and the long-term alteration / disruption as applicable to the following: <ul style="list-style-type: none"> Significant woodlands Significant valleylands Rarity, feature sensitivity/resilience, feature diversity, size and representation on the landscape Individuals/populations or habitats for vegetation Species at Risk Individuals/populations or significant representation of vegetation species of provincial or regional/local conservation concern Opportunities to design, construct, operate and mitigate the alignment to avoid or minimize impacts to woodlands and other vegetation. 	<p>MOST PREFERRED</p> <p>This alternative will have no impact on woodlands, vegetation, or significant floral species at this location.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative may impact vegetation communities that are considered the least rare regionally and that are the most resilient.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>LESS PREFERRED</p> <p>This alternative may impact vegetation communities that are considered rarer regionally and that are the least resilient.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative may impact vegetation communities that are considered the least rare regionally and that are the most resilient.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>LESS PREFERRED</p> <p>This alternative may impact vegetation communities that are considered rarer regionally and that are the least resilient.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative may impact vegetation communities that are considered the least rare regionally and that are the most resilient.</p> <p>The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods									
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G	
	1.2.4. Designated / Special Natural Areas	<ul style="list-style-type: none"> Potential for and significance of encroachment, fragmentation, removal and the long-term alteration / disruption as applicable to the following: <ul style="list-style-type: none"> Purpose / rationale for the original designation (i.e. relative potential to affect the core feature / function designated). Impact to the designated feature and its function(s) Impact to the overall designation (i.e., does the impact effect the purpose of the designation) Designated natural areas include heritage rivers, Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), Natural Heritage System(s), conservation lands (e.g. management tracts, reserves, and conservation areas), etc. 	MOST PREFERRED This alternative will have no impact on designated or special natural areas at this location.	LESS PREFERRED All alignments may encroach into, impact the function of, or remove and fragment, numerous designated and significant natural areas, including: <ul style="list-style-type: none"> The East Don River Headwater Wetland Complex PSW The Maple Spur Channel Earth Science ANSI The Maple Uplands and Kettles Candidate Life Science ANSI The McGill Area ESA Regionally Significant Forests Regional Natural Heritage System Areas Oak Ridge Moraine Conservation Plan Natural Core Areas Greenbelt Plan Protection Areas The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.					
1.3 Groundwater	1.3.1. Areas of Groundwater Recharge or Discharge	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction to areas of groundwater recharge or discharge due to physical intrusion, groundwater interception, dewatering drawdown, soil impoundment and compaction, and the effects on groundwater and surface water base-flow and water quality. 	MOST PREFERRED This alternative will have no impacts on the groundwater recharge or discharge area.	LEAST PREFERRED These alternatives have the potential to impact the known significant groundwater recharge area that encompasses the entire project area.					
	1.3.2. Groundwater Source Areas and Wellhead Protection Areas	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction on groundwater/surface water flow regimes and quality due to physical intrusion, groundwater interception, dewatering drawdown, soil impoundment and compaction, as they pertain to applicable Source Protection 	No Preference None of the alternatives have the potential to impact groundwater source areas or wellhead protection areas.						

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		Area and Wellhead Protection Area policies.						
	1.3.3. Large Volume Wells	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction on groundwater flow regimes and quality due to physical intrusion, groundwater interception, dewatering drawdown, soil impoundment and compaction, and the quantity and quality effects to these large volume wells. The purpose of the water takings from these large volume users must be taken into consideration. 	<p>No Preference</p> <p>None of the alternatives have the potential to impact large volume water supply wells.</p>					
	1.3.4. Private Wells – Domestic and Commercial Groundwater Users	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction on groundwater flow regimes and quality due to physical intrusion, groundwater interception, dewatering drawdown, soil impoundment and compaction, and the quantity and quality effects to groundwater dependent domestic and commercial users. 	<p>No Preference</p> <p>None of the alternatives have the potential to impact domestic or commercial wells.</p>					
	1.3.5. Groundwater – Sensitive Ecosystems	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction on groundwater flow regimes and quality due to physical intrusion, groundwater interception, dewatering drawdown, soil impoundment and compaction, and the effects on groundwater dependent ecosystems, Environmentally Significant Areas and Areas of Natural and Scientific Interest. 	<p>MOST PREFERRED</p> <p>This alternative will have no impacts on groundwater sensitive ecosystems.</p>	<p>LESS PREFERRED</p> <p>These alternatives have the potential to impact an Area of Natural and Scientific Interest (Maple Spur Channel). The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>				
	1.3.6. Highly Vulnerable Aquifers	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction to areas of highly vulnerable aquifers to physical intrusion, interception, dewatering drawdown, soil impoundment and compaction, and the effects 	<p>MOST PREFERRED</p> <p>This alternative will have no impacts on highly vulnerable aquifers.</p>	<p>LESS PREFERRED</p> <p>These alternatives have the potential to impact a highly vulnerable aquifer (Oak Ridges Moraine). The layout of piers and length of spans will be determined at a later stage of study, but it is anticipated that impacts can be avoided/mitigated through the design or with other appropriate mitigation measures.</p>				

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.

Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		on aquifers water base-flow and water quality.						
	1.3.7. Contamination Concerns	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction on introducing contamination through road runoff and by intercepting contaminated groundwater plumes. 	MOST PREFERRED This alternative will have no impacts on contaminated groundwater plumes.	LESS PREFERRED These alternatives have the potential to impact the known contaminated groundwater plumes originating under the Vaughan Landfill. Any potential impacts will be avoided/mitigated through the planning and design process for this project.				
	1.3.8. Existing Landfills	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction adjacent to three closed landfills (A private landfill and the Vaughan Landfill to the north, and the Keele Valley Landfill to the south) with known groundwater contamination issues. 	MOST PREFERRED This alternative will have no impacts on existing landfills and therefore no related risk to impact groundwater contamination.	LEAST PREFERRED This alternative has the potential to impact Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells) and would require excavation through the mound on a former private landfill. This alternative avoids the Keele Valley Landfill to the south.	LEAST PREFERRED This alternative has the potential to impact Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells) and would require excavation through the mound on a former private landfill. This alternative is adjacent to the Keele Valley Landfill for part of its length.	LESS PREFERRED This alternative has the potential to impact Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells). This alternative avoids the Keele Valley Landfill to the south.	MORE PREFERRED This alternative has the potential to impact Vaughan Landfill infrastructure (gas extraction wells and the Teston Road Purge Well System) and is adjacent to Keele Valley landfill for part of its length.	MODERATELY PREFERRED This alternative has the potential to impact Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells and the Teston Road Purge Well System) and is adjacent to the Keele Valley landfill for part of its length.
	1.3.9. Flowing Artesian Conditions	<ul style="list-style-type: none"> Evaluate the potential and significance of road construction to flowing artesian conditions due to physical intrusion. 	No Preference Potential impacts not currently known.					
1.4 Surface Water	1.4.1. Watershed/ Subwatershed Drainage Features/Patterns	Potential and significance of: <ul style="list-style-type: none"> Encroachment, severance, displacement Long-term alteration / disruption as applicable to the following: <ul style="list-style-type: none"> Watercourse crossings (permanent, intermittent, and ephemeral) Flood plain Riparian areas Headwater areas McGill ESAs and ANSI Vegetative community Oak Ridges Moraine – Natural Core Area (2017) 	MOST PREFERRED This alternative has no floodplain impacts.	LESS PREFERRED This alternative would cross the regional floodplain on a skew. The approximate floodplain width is 100m. Placement of bridge piers can mitigate potential floodplain impacts and erosion risks around piers.	MORE PREFERRED This alternative would cross the regional floodplain on a slight skew. The approximate floodplain width is 50m. Placement of bridge piers can mitigate potential floodplain impacts and erosion risks around pier and is less constrained than Alternative 4-A and 4-D.	LESS PREFERRED This alternative would cross the regional floodplain on a skew. The approximate floodplain width is 100m. Placement of bridge piers can mitigate potential floodplain impacts and erosion risks around piers.	MORE PREFERRED This alternative would cross the regional floodplain on a slight skew. The approximate floodplain width is 50m. Placement of bridge piers can mitigate potential floodplain impacts and erosion risks around piers and is less constrained than Alternative 4-A and 4-D.	MODERATELY PREFERRED This alternative would cross the regional floodplain on a slight skew. The approximate floodplain width is 65m. Placement of bridge piers can mitigate potential floodplain impacts and erosion risks around piers and is marginally less constrained than Alternative 4-A and 4-D.

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		<ul style="list-style-type: none"> ○ Watershed and subwatershed management plans. • The approach to the fluvial geomorphology assessment will be confirmed, reviewed and made acceptable to reviewing agencies. • Other concerns: <ul style="list-style-type: none"> ○ Proximity to landfill sites ○ Source water protection 						
	1.4.2. Surface Water Quality and Quantity	<ul style="list-style-type: none"> • Potential and significance of effects on water quality through direct and indirect discharges of contaminated and sediment-laden runoff • Potential and significance of effects on stream hydrology due to changes in ground permeability, modifications to surface drainage patterns and volumes and alterations of water bodies 	MOST PREFERRED This alternative will not impact stormwater management.	MODERATELY PREFERRED Stormwater management impacts and mitigation strategies are similar for all alternatives. Design considerations will be required to suspend storm sewers across length of the bridge and discharge bridge runoff from either side of the valley with appropriate outlet protection and water quality control measures.				
NATURAL ENVIRONMENT SUMMARY (12 Criteria)			MOST PREFERRED (48/48)	LEAST PREFERRED (13/48)	LESS PREFERRED (15/48)	LESS PREFERRED (14/48)	MODERATELY PREFERRED (19/48)	LESS PREFERRED (16/48)
2. LAND USE / SOCIO-ECONOMIC ENVIRONMENT								
2.1 Land Use Planning Policies, Goals, Objectives	2.1.1. Indigenous Land Claims	The potential and significance of: <ul style="list-style-type: none"> • encroachment, severance, displacement • long-term alteration/disruption to Indigenous Land Claims 	No Preference All alternatives are within the area known as the Toronto Purchase (a.k.a. Treaty No.13). In 2010 a settlement for these lands was reached between the Mississaugas and the Government of Canada. Therefore, no alternative will have impact to land claims.					
	2.1.2. Provincial/ Federal Land Use Planning Policies/Goals/ Objectives	<ul style="list-style-type: none"> • How the development of alternatives fits into the Provincial/Federal land use planning policies/goals/ objectives 	LEAST PREFERRED This alternative would result in a transportation network that does not meet the current and projected needs of the province and therefore does not support the policies within the Provincial Policy	MOST PREFERRED These alternatives would result in improvements to the transportation network that meets current and projected needs of the province. It also addresses connectivity, reduction of emissions, and increased safety of the network. This IEA and the evaluation of alternatives supports requirements for infrastructure development within the Oak Ridges Moraine.				

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
			Statement (Sections 1.1.1(g) and 1.6.1(b)) or the Growth Plan for the Greater Golden Horseshoe, (Section 3).					
	2.1.3. Municipal (local and regional) Land Use Planning Policies/ Goals/ Objectives	<ul style="list-style-type: none"> How the development of alternatives fits into the local and regional land use planning policies/goals/objectives (York Region Official Plan, Vaughan) 	<p>LEAST PREFERRED</p> <p>This alternative would result in a transportation network that does not meet the current or projected needs of the Region, or the City of Vaughan given the anticipated population growth and development in the area (i.e., Block 27).</p>	<p>MOST PREFERRED</p> <p>These alternatives would result in improvements to the transportation network that meets current and projected needs of the Region and City of Vaughan.</p>				
	2.1.4. Development Objectives of Private Property Owners	<ul style="list-style-type: none"> Development objectives of private property owners should be in conjunction with land use policies and future land use 	<p>MOST PREFERRED</p> <p>This alternative will have no impacts on the objectives of private property owners.</p>	<p>LEAST PREFERRED</p> <p>This alternative will impact the objectives of private property owners in northwest quadrant of Keele Street/Teston Road by passing through a planned development.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative does not impact development objectives of private property owners.</p>	<p>LEAST PREFERRED</p> <p>This alternative will impact the objectives of private property owners in northwest quadrant of Keele Street/Teston Road by passing through a planned development.</p>	<p>MODERATELY PREFERRED</p> <p>This alternative does not impact development objectives of private property owners.</p>	<p>LEAST PREFERRED</p> <p>This alternative will impact the objectives of private property owners in northwest quadrant of Keele Street/Teston Road by passing through a planned development.</p>
2.2 Land Use - Community	2.2.1. Indigenous Community Reserves	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement, long-term alteration/disruption nuisance effects change to access / travel time to Indigenous Community Reserves. 	<p>No Preferences</p> <p>Alternatives will not have any impacts to Indigenous Community Reserves.</p>					
	2.2.2. Indigenous Sacred Grounds	The potential and significance of:	MOST PREFERRED	MODERATELY PREFERRED				

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		<ul style="list-style-type: none"> encroachment, severance, displacement long-term alteration/disruption nuisance effects change to access/travel time to Indigenous Sacred Grounds. 	This alternative will not have any impacts on Indigenous Sacred Grounds.	There are no known Indigenous Sacred Grounds within the Study Area. Stage 1 archaeological assessments determined there is potential for lands to contain an ossuary. The previous Stage 1 assessment recommended that burial avoidance strategies be implemented to attempt to mitigate any negative impacts to unknown ossuary locations. If one of the alternatives is recommended, it will be subject to additional Stage 2 Archaeological Assessments which will determine appropriate mitigation measures or need for additional assessments (Stage 3/4).				
	2.2.3. Urban and Rural Residential	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement long term alteration/disruption nuisance effects change to access/travel time to urban and rural residential communities. 	LEAST PREFERRED This alternative will have no direct impacts to Urban or Rural Residential land uses but would not improve access/travel times to residential properties in the study area.	MODERATELY PREFERRED This alternative will impact the residential home at 1600 Teston Road; however, this residence is slated for demolition as part of a nearby subdivision development. This alternative will also impact planned residential properties in the NW quadrant of the Dufferin/Teston intersection area. This alternative would improve access/travel times to residential properties in the study area.	MOST PREFERRED This alternative will have no direct impacts to Urban or Rural Residential land uses. This alternative would improve access/travel times to residential properties in the study area.	MODERATELY PREFERRED This alternative will impact the residential home at 1600 Teston Road; however, this residence is slated for demolition as part of a nearby subdivision development. This alternative will also impact planned residential properties in the NW quadrant of the Dufferin/Teston intersection. This alternative would improve access/travel times to residential properties in the study area.	MOST PREFERRED This alternative will have no direct impacts to Urban or Rural Residential land uses. This alternative would improve access/travel times to residential properties in the study area.	MODERATELY PREFERRED This alternative will impact the residential homes at 1500 and 1600 Teston Road. 1600 Teston Road is slated for demolition as part of a nearby subdivision development. This alternative will also impact planned residential properties in the NW quadrant of the Dufferin/Teston intersection. This alternative would improve access/travel times to residential properties in the study area.
	2.2.4. Commercial/ Industrial	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement long term alteration/disruption nuisance effects change to access/travel time to commercial/industrial. 	LEAST PREFERRED This alternative will have no direct impacts to commercial/ industrial land uses but would also not improve access/travel times to commercial/ industrial properties in the study area.	MORE PREFERRED All alternatives will impact access to the properties along Teston Road between Keele Street and Rodinea Road. Specific impacts will be determined and mitigated during the next phase of the project. Property buyouts may be required if access issues can not be resolved. However, these alternatives would also significantly improve access/travel times to commercial/industrial properties in the study area.				

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Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
	2.2.5. Tourist Areas and Attractions	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement long term alteration/disruption nuisance effects change to access/travel time changes to facilities / services to tourist areas and attractions. 	LEAST PREFERRED This alternative limits the number of routes for travellers looking to access tourist areas/attractions.	MOST PREFERRED All alternatives similarly provide reduced travel time to nearby tourist attractions (such as Canada's Wonderland) by providing additional routes for all traffic.				
	2.2.6. Community and Recreational Facilities / Institutions	The potential and significance of: encroachment, severance, displacement <ul style="list-style-type: none"> long term alteration/disruption nuisance effects change to access/travel time changes to facilities / services to community facilities/institutions. 	LESS PREFERRED This alternative would not have an impact to Community & Recreational facilities / institutions but would also not improve access/travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MOST PREFERRED This alternative avoids Phase 3 of the North Maple Regional Park. It would improve access/ travel times.	MORE PREFERRED This alternative mostly avoids Phase 3 of the North Maple Regional Park. It would improve access/ travel times.
	2.2.7. Municipal Infrastructure and Public Service Facilities	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement long term alteration/disruption nuisance effects change to access/travel time changes to facilities / services to municipal infrastructure and public service facilities. 	LESS PREFERRED This alternative will have no direct impacts to municipal infrastructure or public service facilities but would also not improve access/travel times.	MORE PREFERRED All roadway alternatives will impact access to the water pumping station in the northeast corner of the Keele Street/Teston Road intersection. Given a design solution can be found to address access, impacts to the station are negligible and therefore none of these alternatives are less preferred over the Future Do Nothing alternative. These alternatives would improve access/ travel times.				
2.3 Noise Sensitive Areas (NSA's)	2.3.1. Transportation Noise & Vibration	<ul style="list-style-type: none"> Potential for significant traffic noise increases in Noise Sensitive Areas (NSAs) Potential for vibration impacts (any sensitive equipment, or vibration impacts during construction) 	MOST PREFERRED No NSAs would be impacted by this alternative. No construction vibration impacts.	LEAST PREFERRED Many NSAs west of Dufferin Street, north of the alternative, significantly impacted by this alternative as well as construction vibration.	MODERATELY PREFERRED NSAs west of Dufferin Street, north of the alternative impacted by this alternative as well as construction vibration.	LEAST PREFERRED Many NSAs west of Dufferin Street, north of the alternative, significantly impacted by this alternative as well as construction vibration.	MODERATELY PREFERRED NSAs west of Dufferin Street, north of the alternative impacted by this alternative as well as construction vibration.	LEAST PREFERRED Many NSAs west of Dufferin Street, north of the alternative, significantly impacted by this alternative as well as construction vibration.

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
				Noise mitigation (noise barrier on structure) will be required.	Noise mitigation (noise barrier on structure) may be required.	Noise mitigation (noise barrier on structure) will be required.	Noise mitigation (noise barrier on structure) may be required.	Noise mitigation (noise barrier on structure) will be required.
2.4 Land Use - Resources	2.4.1. Indigenous Treaty Rights and Use of Land and Resources for Traditional Purposes	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement, long-term alteration/disruption nuisance effects change to access / travel time to Indigenous Treaty Rights and use of land and resources for traditional purposes. 	MOST PREFERRED This alternative will not have any impacts on Indigenous Treaty Rights and use of land and resources for traditional purposes.	MODERATELY PREFERRED The impacts to the natural areas could result in impacts to uses of the land for traditional purposes, however, no traditional land uses have been identified and it is anticipated that any impacts to these uses would be similar for these alternatives.				
	2.4.2. Agriculture	The potential and significance of: <ul style="list-style-type: none"> Impacts to prime agricultural areas and agricultural infrastructure encroachment, severance, displacement, long-term alteration/disruption nuisance effects to Agricultural Lands 	No preference No agricultural lands would be impacted by this alternative.	No preference There may be minor impacts to existing agricultural lands in the northwest quadrant of Keele Street and Dufferin Street resulting from changes to the intersection that may be required to accommodate any of the alternatives. However, this block is already planned for development. The area in the northwest quadrant is planned to be low-rise mixed use and low-rise residential developments. As such, no agricultural lands will be impacted.				
	2.4.3. Recreational	The potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement long term alteration/disruption nuisance effects change to access/travel time changes to facilities / services to recreational areas and facilities. 	LESS PREFERRED This alternative would not have an impact to Community & Recreational facilities / institutions but would also not improve access/travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MODERATELY PREFERRED This alternative would bisect Phase 3 of the North Maple Regional Park which would limit the options for developing this area as park lands. It would improve access/ travel times.	MOST PREFERRED This alternative avoids Phase 3 of the North Maple Regional Park. It would improve access/ travel times.	MORE PREFERRED This alternative mostly avoids Phase 3 of the North Maple Regional Park. It would improve access/ travel times.
	2.4.4. Aggregate and Mineral Resources	The potential and significance of: <ul style="list-style-type: none"> Encroachment on or loss of aggregate and mineral resources 	No Preference As shown in Schedule 5 of the City of Vaughan Official Plan, parts of the study area are noted as a Secondary Sand and Gravel Resources. Given the area is also part of the Oak Ridges Moraine Conservation Plan which does not allow new aggregate resources extraction in Natural Core Areas, and that the majority of the impacted area is already known to be closed landfills, there are no impacts from any of these alternatives to aggregate and mineral resources. Per Map 9 of the York Region Official Plan, the nearest aggregate/mineral resources area is near Kirby Road between Dufferin Street and Bathurst Street. This area is an aggregate site but also has an active development application with the City of Vaughan to redevelop the property into a residential subdivision.					

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.

Summary of Evaluation Factors and Criteria for Alternative Methods										
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G		
2.5 Major Utility Transmission Corridors		Potential and significance of: <ul style="list-style-type: none"> • Encroachment, severance, displacement; • Long-term alteration / disruption; • Change to access/ travel time; • Change to facilities / utilities / services to major utility transmission corridors (i.e. railroads, hydro, gas, oil). 	No Preference There are no major utility transmission corridors impacted by these alternatives. A section of the TransCanada Pipeline mainline does cross east to west through the study area just south of Kirby Road but is not impacted by the alternatives. Access/travel time to/from major utility transmission corridors may be improved under all Alternatives other than the Future Do Nothing however this is not expected to be a significant factor.							
	2.6 Contaminated Property and Waste Management	2.6.1. Existing landfills under Provincial regulations and ECA requirements	Potential and significance of: <ul style="list-style-type: none"> • Encroachment, severance, displacement; • Long-term alteration / disruption; • Change to access / travel time; • Change to facilities / utilities /services to contaminated property and waste management (e.g., Landfills, Hazardous Waste Sites, "Brownfield" Areas, other known contaminated sites, and high-risk contamination areas); • Road salt impacts; • Collection system for landfill gas 	MOST PREFERRED This alternative will have no impacts on the existing landfills: Vaughan Landfill, Keele Valley Landfill, private landfill.	LEAST PREFERRED This alternative has the potential to impact the Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells). ECA amendments may be required to relocate or modify existing gas collection infrastructure or related to other works. Approval for excavation (mining) of existing landfill waste may require its own EA. This alternative would likely require excavation through the mound on a former private landfill. This alternative will require reconfiguring the access roads to maintain access across the Vaughan Landfill.	LEAST PREFERRED This alternative has the potential to impact the Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells). ECA amendments may be required to relocate or modify existing gas collection infrastructure or related to other works. Approval for excavation (mining) of existing landfill waste may require its own EA. This alternative would likely require excavation through the mound on a former private landfill. This alternative will require reconfiguring the access roads to maintain access across the Vaughan Landfill.	LESS PREFERRED This alternative has the potential to impact the Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells). ECA amendments may be required to relocate or modify existing gas collection infrastructure or related to other works. This alternative may require reconfiguring the access roads to maintain access across the Vaughan Landfill.	MODERATELY PREFERRED This alternative has the potential to impact the Vaughan Landfill infrastructure (gas extraction wells and the Teston Road Purge Well System). ECA amendments may be required to relocate or modify existing leachate and gas collection infrastructure or related to other works. This alternative can mostly maintain the existing accesses to/from and within the landfills.	LESS PREFERRED This alternative has the potential to impact the Vaughan Landfill waste (no liner) and Vaughan Landfill infrastructure (gas extraction wells and the Teston Road Purge Well System). ECA amendments may be required to relocate or modify existing leachate and gas collection infrastructure or related to other works. This alternative will require reconfiguring the access roads to maintain access across the Vaughan Landfill.	
	2.6.2. Contaminated Properties	Potential and significance of: <ul style="list-style-type: none"> • Encroachment, severance, displacement; • Long-term alteration / disruption; 	MOST PREFERRED This alternative will have no impacts on contaminated properties.	MODERATELY PREFERRED These alternatives could impact the following potentially contaminated properties: <ul style="list-style-type: none"> • Metrolinx Barrie Corridor Railway • Fabco/Fabricated Plastics at 2175 Teston Road 						

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		<ul style="list-style-type: none"> Change to facilities / utilities /services to contaminated property 		With advance investigations and planning these impacts can be avoided or mitigated.				
2.7 Air Quality	2.7.1. Local and regional air quality impacts; greenhouse gas emissions	<ul style="list-style-type: none"> Qualitative comparison of alternatives for both local and regional air quality, and for GHG's, based on traffic volumes, speeds, intersection delays and proximity to sensitive receptors. Quantitative assessment of local air quality for the preferred alternative. Consideration of sensitive receptors. 	MOST PREFERRED No sensitive receptors would be impacted by this alternative.	LEAST PREFERRED Many sensitive receptors west of Dufferin Street, north of the alternative potentially impacted locally by this alternative.	MODERATELY PREFERRED Some sensitive receptors west of Dufferin Street, north of the alternative potentially impacted locally by this alternative.	LEAST PREFERRED Many sensitive receptors west of Dufferin Street, north of the alternative potentially impacted locally by this alternative.	MODERATELY PREFERRED Some sensitive receptors west of Dufferin Street, north of the alternative potentially impacted locally by this alternative.	LEAST PREFERRED Many sensitive receptors west of Dufferin Street, north of the alternative potentially impacted locally by this alternative.
			LEAST PREFERRED This alternative would further increase the effects of climate change as it would further exacerbate traffic congestion and result in additional GHG emissions.	MOST PREFERRED These alternatives would result in alleviated traffic congestion, reducing GHG emissions as a result of reduced idling. GHG emissions resulting from construction equipment/materials, would be relatively similar for all options.				
LAND USE / SOCIO-ECONOMIC ENVIRONMENT SUMMARY (16 Criteria)			MODERATELY PREFERRED (31/64)	MODERATELY PREFERRED (34/64)	MORE PREFERRED (42/64)	MODERATELY PREFERRED (35/64)	MOST PREFERRED (48/64)	MORE PREFERRED (37/64)
3. CULTURAL ENVIRONMENT								
3.1 Cultural Heritage – Built Heritage and Cultural Heritage Landscapes	3.1.1. Built heritage resources - These resources may be identified through listing designation or heritage conservation easement under the Ontario Heritage Act, or listed by local, provincial or federal jurisdictions or through technical heritage studies	Potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement, property acquisition; long-term alteration/ disruption; change in area character/ aesthetics; temporary vibration related effects to built heritage structures; permanent obstruction of significant views or vistas; 	No Preference No known or potential built heritage resources were identified adjacent to any of the alternatives. No direct or indirect impacts to any identified built heritage resources are anticipated in any of the shortlisted alternatives					

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Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		<ul style="list-style-type: none"> shadows from any new proposed structures (i.e. bridges); audible or atmospheric elements that may lead to impact (i.e. dust particles from construction activity); nuisance effects; change to access / travel time; change to facilities / utilities / services to BHRs and Cultural Heritage Landscapes (CHLs) of local, provincial or national cultural heritage value or interest including Ontario Heritage Trust easements properties. 						
	3.1.2. Cultural Heritage Landscapes - These resources may be identified through designation or heritage conservation easement under the Ontario Heritage Act, or listed by local, provincial or federal jurisdictions	Potential and significance of: <ul style="list-style-type: none"> encroachment, severance, displacement, property acquisition; long-term alteration/ disruption; change in area character/ aesthetics; temporary vibration related effects to built heritage structures; permanent obstruction of significant views or vistas; shadows from any new proposed structures (i.e. bridges); audible or atmospheric elements that may lead to impact (i.e. dust particles from construction activity); nuisance effects; change to access / travel time; change to facilities / utilities / services to Cultural Heritage Landscapes (CHLs) of local, provincial or national cultural heritage value or interest including Ontario Heritage Trust easements properties. 	MOST PREFERRED No known or potential cultural heritage landscapes would be impacted in the Do Nothing Alternative.	MODERATELY PREFERRED Alternative 4-A has the potential to result in direct impacts to one cultural heritage landscape (1600 Teston Road) with the proposed construction of a structure crossing on the property. Potential impacts to the property at 1600 Teston Road should be assessed in a resource-specific HIA if Alternative 4-A is selected as the preferred alternative.	MORE PREFERRED Alternative 4-B has the potential to result in indirect impacts to one cultural heritage landscape (1600 Teston Road) with the proposed construction of a structure crossing adjacent to the property. Potential indirect impacts could be mitigated with suitable construction staging, limiting the scale of the proposed structure crossing, and post-construction re-planting of any impacted vegetation on the subject property. A resource-specific HIA may be required if Alternative 4-B is selected as the preferred alternative.	MODERATELY PREFERRED Alternative 4-D has the potential to result in direct impacts to one cultural heritage landscape (1600 Teston Road) with the proposed construction of a structure crossing on the property. Potential impacts to the property at 1600 Teston Road should be assessed in a resource-specific HIA if Alternative 4-D is selected as the preferred alternative.	MORE PREFERRED Alternative 4-E has the potential to result in indirect impacts to one cultural heritage landscape (1600 Teston Road) with the proposed construction of a structure crossing adjacent to the property. Potential indirect impacts could be mitigated with suitable construction staging, limiting the scale of the proposed structure crossing, and post-construction re-planting of any impacted vegetation on the subject property. A resource-specific HIA may be required if Alternative 4-E is selected as the preferred alternative.	MODERATELY PREFERRED Alternative 4-G has the potential to result in direct impacts to one cultural heritage landscape (1600 Teston Road) with the proposed construction of a structure crossing on the property. Potential impacts to the property at 1600 Teston Road should be assessed in a resource-specific HIA if Alternative 4-G is selected as the preferred alternative.

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Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
3.2 Cultural Heritage – Built Heritage and Cultural Heritage Landscapes	3.2.1. Pre-contact and Historic Indigenous Archaeological Sites	<ul style="list-style-type: none"> Potential for destruction or disturbance of pre-contact and contact Indigenous archaeological sites of local, provincial or national interest 	MOST PREFERRED No known or potential archaeological sites would be impacted by this alternative.	MODERATELY PREFERRED There are no previously registered pre-contact or contact Indigenous archaeological sites along the proposed alternatives. However, the previous Stage 1 archaeological assessment report documented areas that have archaeological potential. If archaeological sites are encountered during the Stage 2 assessment, additional archaeological assessments (Stage 3 and/or Stage 4) may be required to mitigate the sites. Additionally, there is potential for lands to contain an ossuary. The previous Stage 1 assessment recommended that burial avoidance strategies be implemented to attempt to mitigate any negative impacts to unknown ossuary locations.				
	3.2.2. Historic Euro-Canadian Archaeological Sites	<ul style="list-style-type: none"> Potential for destruction or disturbance of historic Euro-Canadian archaeological sites of local, provincial or national interest. 	MOST PREFERRED No known or potential archaeological sites would be impacted by this alternative.	MODERATELY PREFERRED There are no previously registered historic Euro-Canadian archaeological sites along the proposed alternatives. However, the previous Stage 1 archaeological assessment report documented areas that have archaeological potential. If archaeological sites are encountered during the Stage 2 assessment, additional archaeological assessments (Stage 3 and/or Stage 4) may be required to mitigate the sites.				
CULTURAL ENVIRONMENT SUMMARY (3 Criteria)			MOST PREFERRED (12/12)	MODERATELY PREFERRED (6/12)	MODERATELY PREFERRED (7/12)	MODERATELY PREFERRED (6/12)	MODERATELY PREFERRED (7/12)	MODERATELY PREFERRED (6/12)
4. TRANSPORTATION								
4.1 System Capacity & Efficiency	4.1.1. Movement of People and Goods	<ul style="list-style-type: none"> Potential to support the efficient movement of people between communities based on Level of Service (LOS) and volume to capacity (v/c) on a network screenline and critical link basis. 	LEAST PREFERRED This alternative does not support the efficient movement of people/goods.	MOST PREFERRED All alternatives support the efficient movement of people between communities based on Level of Service (LOS) and volume to capacity (v/c) on a network screenline and critical link basis.				
	4.1.2. System performance during peak periods	<ul style="list-style-type: none"> Potential to reduce growth in peak hour travel demand through TDM and TSM strategies. 	LEAST PREFERRED This alternative does not reduce growth in peak hour travel demand.	MOST PREFERRED All alternatives reduce growth in peak hour travel demand through TDM and TSM strategies.				
4.2 System reliability / redundancy		<ul style="list-style-type: none"> Potential to support system reliability and redundancy for travel between communities during adverse conditions. 	LEAST PREFERRED No improvements to the transportation network are provided.	MOST PREFERRED Providing a new transportation link between Keele Street and Dufferin Street completes the regional arterial road network and provides additional redundancy and alternate routes to navigate through the study area.				
4.3 Safety	4.3.1. Traffic Safety	<ul style="list-style-type: none"> Potential to improve traffic safety based on opportunity to reduce 	LEAST PREFERRED No reduction to traffic volumes and congestion	MOST PREFERRED All alternatives provide traffic safety improvements by reducing congestion along existing roads in the transportation network through the redistribution of traffic along the new Teston Road extension.				

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Summary of Evaluation Factors and Criteria for Alternative Methods								
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
		traffic volumes and/or congestion in the study area.	is provided within the transportation network					
	4.3.2. Emergency Access	<ul style="list-style-type: none"> Potential to provide and/or improve emergency access on existing and/or New York Region facilities. 	<p>LEAST PREFERRED</p> <p>This alternative does not provide and/or improve emergency access.</p>	<p>MOST PREFERRED</p> <p>These alternatives provide/improve access for emergency services. Particularly Vaughan Fire Station 7-10 (Dufferin Street/Teston Road) which will have improved access to the western portion of the City of Vaughan.</p>				
4.4 Traffic Operations, Mobility & Accessibility	4.4.1. Modal integration, balance	<ul style="list-style-type: none"> Potential to improve existing and future transportation conditions for all the transportation modes including auto, cyclist, pedestrian and transit. Assess performance of proposed transportation improvement alternatives, based on transportation analysis (e.g. screenline analysis and intersection operational analysis – identifying volume/capacity ratio, level of service, travel time / delay, etc.); and potential to address congestion and opportunity to provide network improvements for various transportation modes. 	<p>LEAST PREFERRED</p> <p>This alternative does not have the potential to improve existing and future transportation conditions for auto, cyclist, pedestrian and transit traffic or addressing congestion.</p>	<p>MOST PREFERRED</p> <p>These alternatives improve the transportation conditions within the study area by providing additional lanes, dedicated bike lanes / cycle tracks and sidewalks / multi-use paths to accommodate all modes of transportation including auto, cyclists, pedestrians and transit. The additional facilities will improve the transportation network and relieve existing congestion.</p>				
	4.4.2. Linkages to Population and Employment Centres	<ul style="list-style-type: none"> Potential to improve accessibility to urban growth centres for people and goods movement based on higher order network continuity and connectivity. 	<p>LEAST PREFERRED</p> <p>This alternative does not improve access to urban growth centres.</p>	<p>MOST PREFERRED</p> <p>These alternatives provide/improve access to urban growth centres noted in the City of Vaughan's Official Plan such as the Primary Intensification Corridor located along Major Mackenzie Drive West, the Local Centre at Keele Street/Major Mackenzie Drive West, employment areas at Teston Road/Keele Street and north of Teston Road between Jane Street and Highway 400.</p>				
	4.4.3. Accommodation for pedestrian and cyclists	<ul style="list-style-type: none"> Potential to accommodate pedestrians and cyclists within critical travel corridors. As well as preservation of existing and future planned pedestrian and cycling facilities including nature trails. 	<p>LEAST PREFERRED</p> <p>This alternative does not accommodate pedestrians and cyclists. However, it does not impact any planned facilities as part of the North Maple Regional Park or the Vaughan Super Trail. It also does not provide any additional connections to these facilities.</p>	<p>MOST PREFERRED</p> <p>These alternatives all provide the ability to accommodate pedestrians and cyclists. While they all bisect the planned Vaughan Super Trail, they would also provide additional pedestrian and cyclist access to the trail and to any facilities planned as part of the North Maple Regional Park.</p>				

Summary of Evaluation Factors and Criteria for Alternative Methods									
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G	
4.5 Network Compatibility	4.5.1. Movement of People and Goods	<ul style="list-style-type: none"> Potential to improve Regional and local network connectivity within, through and to/from the Preliminary Study Area. 	LEAST PREFERRED This alternative does not improve the network connectivity.	MOST PREFERRED These alternatives improve the regional and local network connectivity.					
	4.5.2. Movement of People and Goods	<ul style="list-style-type: none"> Potential to address future transportation needs beyond the forecasted planning horizons. 	LEAST PREFERRED This alternative does not address future transportation needs beyond the forecasted planning horizons.	MOST PREFERRED These alternatives provide additional capacity to address future transportation needs.					
4.6 Engineering	4.6.1. Constructability	<ul style="list-style-type: none"> Potential ease of implementation considering feasibility/difficulty of physical, property or environmental constraints. 	MOST PREFERRED No construction means no constructability issues.	LEAST PREFERRED Road alignment avoids impacting existing landfill infrastructure. The road construction is largely in a brownfield situation with significant cuts and fills through multiple landfills The bridge length is the longest requiring many spans. The curved alignment will require shorter spans to accommodate torsion and limited number of viable structure types (post-tensioned voided slab and steel box girder) The superelevation transition will occur on the structure resulting in complex geometry for design, and require staged construction of the deck in the transition zones. The skew of the Don Valley River will require a large span over the river.	LEAST PREFERRED Road alignment avoids impacting existing landfill infrastructure. The road construction is largely in a brownfield situation with significant cuts and fills through multiple landfills The bridge length is one of the shortest and relatively straight alignment. Curved alignment at the west end causes superelevation transition on structure, requiring staged construction of deck in transition zone.	LEAST PREFERRED Road alignment will impact a portion of the existing landfill infrastructure. The alignment will allow the existing road segment from Keele Street to Rodinea Road to be reconstructed. A portion of the road will be constructed on the landfill with significant cuts and fills The bridge length is the longest alternative requiring many spans. The curved alignment will require shorter spans to accommodate torsion and limited number of viable structure types (post-tensioned voided slab and steel box girder). The superelevation transition will occur on the structure resulting in complex geometry for design, and require staged construction of	LEAST PREFERRED Road alignment will impact a portion of the existing landfill infrastructure. The alignment will allow the existing road segment from Keele Street to Rodinea Road to be reconstructed. Lower potential impacts to both landfills by using the existing right-of-way. The potential bridge length can accommodate a shorter length on a tangent alignment. No superelevation on structure and deck can be constructed in one stage. River skew to road at this location is most square to bridge allowing for pier construction far from waterway, but potential inwater work on north side where lake is formed. I-girders can be used on straight alignment and straight alignment allows for launching of girders and fewer requirements for crane access for	MODERATELY PREFERRED The alignment will allow the existing road segment from Keele Street to Rodinea Road to be reconstructed. Lower potential impacts to both landfills by using the existing right-of-way. The potential bridge length can accommodate a shorter length on a tangent alignment. No superelevation on structure and deck can be constructed in one stage. River skew to road at this location is most square to bridge allowing for pier construction far from waterway, but potential inwater work on north side where lake is formed. I-girders can be used on straight alignment and straight alignment allows for launching of girders and fewer requirements for crane access for	LEAST PREFERRED The alignment will allow the existing road segment from Keele Street to Rodinea Road to be reconstructed. Potential moderate impacts to existing landfill infrastructure by only partially using the existing right-of-way. The bridge length is one of the longest alternatives requiring many spans. The curved alignment will require shorter spans to accommodate torsion. The superelevation transition will occur on the east end of the structure resulting in complex geometry for design, and require staged construction of the deck in the transition zone. The skew of the Don Valley River will require a large span over the river.

The assessment within this table accounts for the implementation of appropriate mitigation measures and then evaluates the Alternatives based on remaining impacts.



Summary of Evaluation Factors and Criteria for Alternative Methods									
FACTORS	SUB-FACTORS	CRITERIA	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G	
						the deck in the transition zones. The skew of the Don Valley River will require a large span over the river.	girder erection in ravine, but cranes will still be required for construction of piers and pier foundations		
	4.6.2. Compliance with design criteria	<ul style="list-style-type: none"> Conformity to applicable York Region safety and design standards. 	MODERATELY PREFERRED Less potential to bring existing Teston Road to current standards	MOST PREFERRED Design for all alternatives will be performed in accordance with York Region safety and design standards, and current regulations					
4.7 Construction Cost		<ul style="list-style-type: none"> Relative road construction costs. 	MOST PREFERRED No costs are required.	LEAST PREFERRED Highest relative construction costs due to length and complexity of the crossing structure and building over Vaughan Landfill and excavating within private landfill.	LESS PREFERRED Lower relative road/bridge construction costs due to shorter length and simpler tangent crossing structure but requires building over Vaughan Landfill and excavating within private landfill.	LESS PREFERRED Higher relative road/bridge construction costs due to length and complexity of the crossing structure and requires building over Vaughan Landfill.	MORE PREFERRED Lower relative road/bridge construction costs due to shorter length, simpler tangent crossing structure and avoids building over landfills.	LESS PREFERRED Higher relative road/bridge construction costs due to length and complexity of the crossing structure and may require building over part of Vaughan Landfill.	
TRANSPORTATION SUMMARY (13 Criteria)			LEAST PREFERRED (10/52)	MODERATELY PREFERRED (44/52)	MODERATELY PREFERRED (45/52)	MODERATELY PREFERRED (45/52)	MOST PREFERRED (47/52)	MODERATELY PREFERRED (45/52)	

*Future Do Nothing refers to an alternative where all other planned improvements within the study area are implemented, except a Teston Road connection.

For internal team reference (for now) relative preference points are assigned as follows: Least = 0, Less = 1, Moderately = 2, More = 3, Most = 4.

Evaluation Summary

	Future Do Nothing*	Alternative 4-A	Alternative 4-B	Alternative 4-D	Alternative 4-E	Alternative 4-G
NATURAL ENVIRONMENT SUMMARY	MOST PREFERRED (4)	LEAST PREFERRED (0)	LESS PREFERRED (1)	LESS PREFERRED (1)	MODERATELY PREFERRED (2)	LESS PREFERRED (1)
LAND USE / SOCIO-ECONOMIC ENVIRONMENT SUMMARY	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MORE PREFERRED (3)	MODERATELY PREFERRED (2)	MOST PREFERRED (4)	MORE PREFERRED (3)
CULTURAL ENVIRONMENT SUMMARY	MOST PREFERRED (4)	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)
TRANSPORTATION SUMMARY	LEAST PREFERRED (0) <i>(Does not address Problems/Opportunities)</i>	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MODERATELY PREFERRED (2)	MOST PREFERRED (4)	MODERATELY PREFERRED (2)
EVALUATION RESULTS (4 Factor Groups)	Not Recommended (10/16)	Not Recommended (6/16)	CARRY FORWARD (ALTERNATE) (8/16)	Not Recommended (7/16)	RECOMMENDED (12/16)	CARRY FORWARD (ALTERNATE) (8/16)
RANKING	6	5	2	4	1	2