December 2023 CA-WSP-17M-01712-11

APPENDIX O

Short-List of Alternatives Evaluation Tables

				COUNTY ROAD 26 EV	ALUATION TABLE	County Road 26	
C _f	ATERIA MEIGHT	N. KAR	CALK	Nord Top	C-2	C-6	C-7
				Alternative Description	Replace bridge to the west (intermediate)	Replace bridge on existing alignment (temporary closure)	Replace bridge on existing alignment (temporar single-lane traffic control)
				Fish & Aquatic Habitat	SCORE 0	SCORE 0	SCORE 0
				Direct and/or indirect impacts on fisheries, including Species at Risk (SAR).	No watercourses identified within 30 m	of proposed work area; no impacts anticipated as a re	sult of the proposed work.
					5	1	1
				Terrestrial Ecosystems Direct and/or indirect impacts on vegetation communities, significant wildlife, wildlife habitat, and movement patterns, including SAR.	Alignment travels through young conifer plantation south of 401 and cultural meadow north of 401. Vegetation types not significant and provides general wildlife habitat for common species. Cultural meado north of 401 provides potential breeding habitat for SAR Eastern Meadowlark/Bobolink and would include removal of approximately 1.8 ha. Telephone Road: Removal of swath of conifer plantation and edge mixed woodland for realignment; impact also from creating small plantation patch between grading limit and existing Telephone Rd.	Minor vegetation removal associated with widening on existing alignment. Minor removal of potential habitat for SAP Fastern Meadwark Robbilish	minor vegetation removal associated with widening existing alignment. Minor removal of potential habit for SAR Eastern Meadowlark/Bobolink.
				Designated Natural Features Direct and/or indirect impacts on Designated Natural Areas, including Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSI), and Provincially Significant Wetlands (PSWs).	0	0 No designated natural areas	0
				Contamination Number of potentially contaminated properties to be impacted.	0	No impact	0
	Natural Environment	25%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant	Excess Soil Management Quantity excess soil subject to O.Reg. 406/19 (relative to other alternatives). Erosion and Sediment Control	1 Minor shallor	w cut resulting in relatively low quantities of excess soil	1
			impact	Qualitative measure of impacts to areas with Erosion and Sediment Control concern		lium erosion potential but only minor cut and fill	1
				Surface Water & Drainage Number of watercourse crossings and impacts to surface water features; Impacts to existing highway drainage systems and ability to provide stormwater management.	All alternatives have the same amount of	impervious area from a drainage analysis perspective a alternatives there are no watercourses crossing.	and hence the same impacts.
				Groundwater Qualitative / quantitative assessment of impacts to groundwater.	No wetlands, IPZ or ANSI are present within this alternative. No ponds or waterbodies are present within 100 m of this alternative. One watercourse is present within this alternative. Zero indicators of potential groundwater upwelling were observed neath this alternative. 35% of this alternative is within a WHPA-B, 50% is within a WHPA-C and 5% is within a WHPA-D, 10% is not within a WHPA. 35% of this alternative is within an SGRA and HVA. 100% of this alternative is within an area of high groundwater susceptibility and 5% is within an area of high surface water susceptibility. One well with a shallow water level (less than 3mbgs) is present within this alternative. There are 2 other wells present. Two deep (greater than 15 mbgs) domestic water supply wells are present within this alternative. One deep municipal water supply well in present. No impacts to wetlands, waterbodies, or shallow wells are anticipated. Potential impacts to one watercourse and shallow groundwater are anticipated. Mitigation measures to protect sensitive source water features are required.	No wetlands, IPZ or ANSI a No ponds or waterbodies are pr One watercourse is pr Zero indicators of potential groundwater 10% of this alternative is within a WHPA-B, 75% is not wit 10% of this alternative 10% of this alternative 100% of this alternative is within an area of high gr surface wa One well with a shallow water level (less than 3 mb Two deep (greater than 15 mbgs) domestic w No impacts to wetlands, waterb Potential impacts to one watercours Mitigation measures to protect sen	are present within this alternative. resent within 100 m of this alternative. resent within this alternative. resent within this alternative. upwelling were observed near this alternative. s within a WHPA-C, and 10% is within a WHPA-D. 5% i hin a WHPA. is within an SGRA and HVA. roundwater susceptibility and 5% is within an area of high ter susceptibility. ggs) is present within this alternative. There is 1 other woresent. varater supply wells are present within this alternative. odies, or shallow wells are anticipated. se and shallow groundwater is anticipated. sitive source water features are required.
_	Fotal Natural Fotal Natural				2.25	1.25 1	1.25
S	Summary of N	latural	Environmer	nt Key Aspects	From a Natural Environment perspective Alternati to potential breeding habitat for SAR Eastern Mea Telephone Road realignment.		•
				Archaeology	3	3	3
				Impacts to known archaeological features or areas of archaeological potential.	Archaeological potential is present in all three alternatives. This alternative requires significantly more Stage 2 survey than alternative C6 and C7.	comparable to C-7.	significantly less than alternative C-2 and comparab to C-6.
	Cultural Environment	20%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage Act (OHA) or listed on municipal Heritage Registers; number of cultural heritage landscapes displaced or disrupted;	Impact to 1 CHL (638 County Road 26) due to property taking/grading. CHER was completed for 638 County Road 26 and it was found to possess cultural heritage value or interest and is now identified as a Provincial Heritage Property (PHP). A Heritage Impact Assessment (HIA) is recommended to be prepared in advance of Detail Design if possible. Impact to Telephone Road CHL alignment.	Impact to 1 CHL (638 County Road 26) due to pr County Road 26 and it was found to possess cult Provincial Heritage Property (PHP). A Heritage Imp	roperty taking/grading. A CHER was completed for 638 tural heritage value or interest and is now identified as a sact Assessment (HIA) is recommended to be prepared tail Design if possible.
				Impacts to Indigenous lands The extent of Indigenous lands required.	0 The study area falls within the boundaries of the 1923 Williams Treatie Mississaugas of Alderville, Curve Lake, Hiawatha, and Scugog Islandaries.		
_	Fotal Cultural				1.6	1.6	1.6
S	Summary of C	ultura	I Environme	nt Key Aspects	From a Cultural Environment perspective there is no for a potential cultural heritage landscape and a CHEI or interest and is now identified as a Provincial Heritagorepared in advance of Detail Design if possible. Alte there is no significant difference in the archaeological equal for all alternatives.	R was completed. 638 County Road 26 wage Property (PHP). A Heritage Impact Assemative C-2 is anticipated to impact more a potential of the alternatives. The possibilit	as found to possess cultural heritage value sessment (HIA) is recommended to be areas that contain archaeological potential ty of recovering archaeological material is
				Property & Access Number of residential and commercial/industrial properties / accesses impacted.	Impacts to 8 private properties and 7 accesses due to road realignments, with grading limits in close proximity to some existing buildings. Greater number of impacts and impacted area compared to Alternatives 6 and 7.	Alte	. Smaller impacted area and less severe impacts than renative 2.
				Noise Number of noise sensitive receptors/areas within 600 m and ability to provide noise mitigation measures (if required).	Since the County Road 26, is	3 s not the dominant source these options have less variations.	ations in impact.
				Community Facilities Number of cemeteries, schools, places of worship, and recreation centres directly impacted or potentially displaced.	0 No cemeteries, schools, places	0 of worship, or recreation centres directly impacted or pr	0 otentially displaced.
				Recreation and Tourism Features Number of parks and trails directly impacted. Air Quality and Climate Change	Per the Northumberland County Transportation Master Plan (2017), Nono trail networks or recreases	orthumberland County Cycling Master Plan (2014), and ational facilities within the County Road 26 bridge replace	

OVERALL SO	CORF			8.45	7.55	8.15
						0.45
Summary of C	ost Ke	y Aspects		Alternatives C-6 and C-7 have the lowest estimated	cost.	
Total Cost Rai				3	1	1
Total Cost Sco	ore			0	0	0
Cost	0%	1 = minor impact 3 = moderate impact 5 = significant impact	highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction Programming / Planning.	Highest estimated cost due to County Road 26 and Telephone Road realignments.		xisting road alignments are maintained.
		0 = no impact	Cost Estimate (Parametric) Parametric cost estimate for structures,	3 \$ 9.5 M	1 \$ 7.3 M	1 \$7.3 M
Aspects	i ansp(riadon/10	ominical Considerations Rey	From a Transportation/Technical perspective, Alter construction staging impacts and has better construction		
			Considerations Rank chnical Considerations Key	1	2	3
Total Transpo	rtation	/ Technical	Maintenance of retaining walls, snow clearing. Considerations Score	There are no proposed retain	ing walls or major snow clearing considerations for the	e alternatives.
			Maintenance	0	0	0
			Construction staging impacts, accommodation of traffic during construction, detour/out-of-way travel requirements, including impacts to emergency services response times.	Bridge is constructed on separate alignment, which minimizes traffic impacts during construction.	Bridge will be fully closed, with detour via County Road 20 resulting in out-of-way travel for residents and for access to the County landfill on County Road 26.	Bridge will have one-way signalized traffic du construction. Complicated staging due to bri demolition and new construction while mainta traffic. Maintaining traffic on the existing road construction.
			Construction Staging	1	5	3
Transportation / Technical Considerations	30%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Complexity of construction of structures and crossing road improvements, utility relocation requirements.	and skew of bridge over Highway 401 increases construction complexity. High potential for impacting existing hydro poles due to grading and anticipated to require relocation of some hydro poles impacted by road realignment.	To maintain the existing alignment (and tie into the existing profile), a thin bridge structure must be used. High potential for impacting existing hydro poles due to grading.	To maintain the existing alignment (and tie intexisting profile), a thin bridge structure must be
		0 - rai	Constructability	Constructing entirely new alignment and tie in to existing alignment is more difficult than Alternatives 6 and 7. Construction of realigned roads	Simplest construction since road will be closed and existing alignment is maintained, maximizing reuse of the existing infrastructure.	Most difficult construction due to partial demolition/staging and maintaining vehicle tra Existing alignment is maintained, maximizing re the existing infrastructure.
				Skew of County Road 26 underpass relative to Highway 401 is worse than existing.	1	5
			Traffic Operations and Geometry Crossing road geometry, geometry/tie-in of intersecting roads.	County Road 26 horizontal alignment is improved compared to existing. Sight distance to Telephone Road intersection can be improved compared to existing. Telephone Road geometry is worse than existing. Sight distance to County Road 26 intersection are not ideal.	Constrained geometric elements such as sight distance and skewed intersection due to existing conditions.	Constrained geometric elements such as sight di and skewed intersection due to existing condit
				impacted area to private properties. From an Air Qu potential to increase emissions. 3 County Read 36 herizontal alignment is improved compared to existing	ality perspective Alternative is C-7 is a	slightly preferred due to the lowest
Fotal Socio-Ed Summary of S			nent Rank nvironment Key Aspects	3 From a Socio-Economic perspective both Alternative		
Гotal Socio-Ec				2.5	policies.	2
			Approved Local, Regional and Provincial Plans and Policies Assessment of conformity with approved	0 The proposed County Road 26 bridge replacement conforms with the		0 r Transportation Master Plan, and provincial plans
			Impact on local agricultural resources using quantitative measure of area (ha).		and designated as agricultural land use.	
			Agricultural Resources	1	1	1
				During Construction -Construction impacts from option C-2 are decreased at three sensitive receptors (residences) on Telephone Rd. and County Rd. 26 as a result of the increased distance to the new bridge alignment -Construction impacts are minimally increased for one receptor to the West (approx. 400m separation to nearest residential building). -Greater length of Construction zone for option C-2 increases emissions; due to increased construction time. -No road closure anticipated during construction will allow continuing bridge traffic while the new alignment is constructed. This leads to combined effects of construction emissions plus existing vehicle traffic emissions (operational).	-Impacts from option C-6 impact nearby receptors during construction only. -Temporary road closure to complete construction may speed up construction timeline; diverts existing road traffic away from the nearby receptors eliminating a combined construction plus traffic emission scenario. -Bridge closure and road detour increases emissions in the vicinity of the construction zone.	-Construction emissions from option C-7 impact receptors during construction onlyTemporary single lane traffic control to complete construction may only slightly speed up constructimeline; shorter construction timeline decreases emission potentialTemporary single lane traffic control anticipated
Socio-Economic Environment	25%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Qualitative assessment of impacts to air quality and greenhouse gas emissions. N.B. MTO Guide identifies 500 m as the distance 'to avoid the need for air quality impact mitigations' in most cases.	Road segment length increases approximately 20m, results in minimal increase to emissions. -Replacing the bridge to the West reduces impact for three receptors (residences) on Telephone Rd. and County Rd. 26 due to increased distance to the road way. -Replacing the bridge to the West decreases the distance to one receptor West of the existing bridge however the impact is anticipated to be minimal as the receptor is over 400m away from the new bridge alignment.	-Road segment length and alignment remains the same, emissions do not increase. Emission increase with expected population growth; not associated with bridge replacement. -Replacing the bridge on the same alignment does not increase or decrease distances to the sensitive receptors (residences). No impact to emissions as a result of the bridge replacement. During construction	

Notes:

1) Each indicator is given a score of 0 = no impact, 1 = minor impact, 3 = moderate impact, 5 = significant impact.

2) Each indicator is given equal weight within its respective criteria.

3) Each of the 4 criteria have different weights.

4) The preferred alternative is chosen based on the least amount of impact (i.e. the closer the overall score is to 0, the better the alternative is).

			HERLEY ROAD EVALU	JATION TABLE	Herley Road	
RIERIA WEIGH	NIE NA	SCALE.	NO _{ICA TOR}	H-1	H-2	H-3
			Alternative Description	Replace bridge to the west	Replace bridge to the east	Replace bridge on existing alignment (temporary closure)
			Fish & Aquatic Habitat Direct and/or indirect impacts on fisheries, including Species at Risk (SAR).	0 No watercourses identified	SCORE 0 within 30 m of proposed work area; no impacts anticipa	SCORE 0 ated as a result of the proposed work.
			Terrestrial Ecosystems Direct and/or indirect impacts on vegetation communities, significant wildlife, wildlife habitat, and movement patterns, including SAR.	Vegetation cover is thicket, cultural woodland, cultural meadow and agricultural. Common and not significant. General wildlife habitat and use by common species. Agricultural field in N section provides potential breeding habitat for SAR Eastern Meadowlark/Bobolink.	1 Vegetation cover is cultural meadow, cultural woodland and a small area of poplar deciduous forest General wildlife habitat and use by common species. No potential breeding habitat for Eastern Meadowlark/Bobolink.	
			Designated Natural Features Direct and/or indirect impacts on Designated Natural Areas, including Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSI), and Provincially Significant Wetlands (PSWs).	0	0 No designated natural features	0
		0 it	Contamination Number of potentially contaminated properties to be impacted.	0	0 No impact	0
Natural	059/	0 = no impact 1 = minor impact	Excess Soil Management	1	1	1
Environment	25%	3 = moderate impact 5 = significant impact	Quantity of excess soil subject to O.Reg. 406/19 (relative to other alternatives). Erosion and Sediment Control		Minor shallow cut resulting in relatively low quantities of	1
			Qualitative measure of impacts to areas with Erosion and Sediment Control concern	1	1 Minor shallow cut, low erosion potential	1
			Surface Water & Drainage Number of watercourse crossings and	1	1 amount of impervious area from a drainage analysis p	1
			impacts to surface water features; Impacts to existing highway drainage systems and ability to provide stormwater management.		In all alternatives there are no watercourses cross	sing.
			Groundwater Qualitative / quantitative assessment of impacts to groundwater.	Ni Zero indica 90 100% of this alternative is within an	atercourses, wetlands, IPZ or ANSI are present within o ponds or waterbodies are present within 100 m of this ators of potential groundwater upwelling were observed % of this alternative is within a WHPA-B, 10% is within a rise and the state of high groundwater susceptibility and 0% is within a rea of high groundwater susceptibility and 0% is within a rea of high groundwater susceptibility and 0% is within a reason of high groundwater susceptibility and 0% is within a reason of the state of the	s alternative. near this alternative. a a WHPA-C. in an HVA. in an area of high surface water susceptibility.
				Three shallow (less than 15 mbg	Iter level (less than 3mbgs) is present within this alternates) domestic water supply wells are present within this a primacts to watercourses, wetlands or waterbodies are	alternative. One abandoned well is present.
				Three shallow (less than 15 mbg No Potentia		alternative. One abandoned well is present. e anticipated. ter are anticipated.
Total Natural Total Natural	Enviro	nment Ranl	e	Three shallow (less than 15 mbg Nc Potentia Mitiga 1.25	ps) domestic water supply wells are present within this a o impacts to watercourses, wetlands or waterbodies are il impacts to three shallow wells and shallow groundwat ation measures to protect sensitive source water feature 1.25	alternative. One abandoned well is present. a anticipated. ter are anticipated. es are required. 1.75 3
Total Natural	Enviro	nment Ranl	e	Three shallow (less than 15 mbg Nc Potential Mitigs 1.25 1.25 From a Natural Environmental pers differences in the vegetation remov	is) domestic water supply wells are present within this a b impacts to watercourses, wetlands or waterbodies are it impacts to three shallow wells and shallow groundwat ation measures to protect sensitive source water feature.	alternative. One abandoned well is present. anticipated. ter are anticipated. es are required. 1.75 3 eferred alternative. There is small the differences are small. Alternative H
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Total Natural	Enviro Natural	O = no impact 1 = minor impact impact	Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural Heritage Landscapes	Three shallow (less than 15 mbg Nc Potential Mitigate 1.25 1.25 1 From a Natural Environmental pers differences in the vegetation remov does have a lesser area of impact to 3	ps) domestic water supply wells are present within this a bound impacts to watercourses, wetlands or waterbodies are all impacts to three shallow wells and shallow groundwat ation measures to protect sensitive source water feature 1.25 1.25 1 pective there is no preference for a prevals for the terrestrial component but the protection of the protection of the protection of the protection of the terrestrial component but the protection of	alternative. One abandoned well is present. a anticipated. ter are anticipated. es are required. 1.75 3 sterred alternative. There is small the differences are small. Alternative Handward Meadowlark/Bobolink.
Total Natural Summary of I	Enviro	0 = no impact 1 = minor	e Int Key Aspects Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural	Three shallow (less than 15 mbg No Potential Mittga 1.25 1.25 1 From a Natural Environmental pers differences in the vegetation remov does have a lesser area of impact to 3 Archaeological potential is present in	ps) domestic water supply wells are present within this a bound of the process of the packs to watercourses, wetlands or waterbodies are all impacts to three shallow wells and shallow groundwat atton measures to protect sensitive source water featured the process of the protect sensitive source water featured the process of the protective source water featured the process of the	alternative. One abandoned well is present. a canticipated. ter are anticipated. es are required. 1.75 3 efferred alternative. There is small the differences are small. Alternative Handowlark/Bobolink. 3 equired is comparable for all three alternatives.
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Total Natural Summary of I Cultural Environment	20%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage Act (OHA) or listed on municipal Heritage Registers; number of cultural heritage landscapes displaced or disrupted; Impacts to Indigenous lands The extent of Indigenous lands required.	Three shallow (less than 15 mbg No Potential Mitiga 1.25 1.25 1 From a Natural Environmental pers differences in the vegetation remov does have a lesser area of impact to 3 Archaeological potential is present in 1 Impact to 1 CHL (Durham Road/Herley Road No 1 CHL (Durham Road No 1 CHL	ps) domestic water supply wells are present within this a bound impacts to watercourses, wetlands or waterbodies are all impacts to three shallow wells and shallow groundwat atton measures to protect sensitive source water feature. 1.25 1 pective there is no preference for a prevals for the terrestrial component but the proposition of the protection	alternative. One abandoned well is present. a anticipated. ter are anticipated. es are required. 1.75 3 Per le alternative. There is small the differences are small. Alternative Handowlark/Bobolink. 3 equired is comparable for all three alternatives. 0 No impacts as road alignment will not change the state of the
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Total Natural Summary of I Cultural Environment Total Cultura Total Cultura	20%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage Act (OHA) or listed on municipal Heritage Registers; number of cultural heritage landscapes displaced or disrupted; Impacts to Indigenous lands The extent of Indigenous lands required. re k ent Key Aspects Property & Access Number of residential and commercial/industrial properties /	Three shallow (less than 15 mbg Nc Potential Mittgat 1.25 1 From a Natural Environmental pers differences in the vegetation remov does have a lesser area of impact to 3 Archaeological potential is present in 1 Impact to 1 CHL (Durham Road/Herley Road Impact Impact to 1 CHL (Durham Road/Herley Road Impact	ps) domestic water supply wells are present within this is impacts to watercourses, wetlands or waterbodies are it impacts to three shallow wells and shallow groundwat ation measures to protect sensitive source water feature. 1.25 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	alternative. One abandoned well is present. a anticipated. The are anticipated. The are anticipated as are required. 1.75 3 Seferred alternative. There is small the differences are small. Alternative Heart and the mean and t
Total Natural Summary of I Cultural Environment Total Cultura Total Cultura	20%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage Act (OHA) or listed on municipal Heritage landscapes displaced or disrupted; Impacts to Indigenous lands The extent of Indigenous lands required. Te k But Key Aspects Property & Access Number of residential and commercial/industrial properties / accesses impacted. Noise Number of noise sensitive receptors/areas within 600 m and ability to provide noise	Three shallow (less than 15 mbg No Potential Mittgate 1.25 1 From a Natural Environmental pers differences in the vegetation remove does have a lesser area of impact to 3 Archaeological potential is present in 1 Impact to 1 CHL (Durham Road/Herley Road Programment Person 1 CHL (Durham Road/Herley Road Programment Person 2 CHL (Durham Road/Herley Road Programment Person 3 CHL (Durham Road/H	ps) domestic water supply wells are present within this a or impacts to watercourses, wetlands or waterbodies are at impacts to three shallow wells and shallow groundwal ation measures to protect sensitive source water feature. 1.25 1 1 1.25 1 1 1 1 1 1 1 1 1 1 1 1 1	atternative. One abandoned well is present. a anticipated. ter are anticipated. es are required. 1.75 3 sterred alternative. There is small the differences are small. Alternative Handowlark/Bobolink. 3 equired is comparable for all three alternatives. 0 No impacts as road alignment will not change the state of the study area for th
Total Natural Summary of I Cultural Environment Total Cultura Total Cultura	20%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Archaeology Impacts to known archaeological features or areas of archaeological potential. Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage Act (OHA) or listed on municipal Heritage landscapes displaced or disrupted; Impacts to Indigenous lands The extent of Indigenous lands required. Impacts to Indigenous lands required.	Three shallow (less than 15 mbg No Potential Mittgate 1.25 1 From a Natural Environmental pers differences in the vegetation remove does have a lesser area of impact to 3 Archaeological potential is present in 1 Impact to 1 CHL (Durham Road/Herley Road Programment Person 1 CHL (Durham Road/Herley Road Programment Person 2 CHL (Durham Road/Herley Road Programment Person 3 CHL (Durham Road/H	ps) domestic water supply wells are present within this a point pacts to watercourses, wetlands or waterbodies are all impacts to three shallow wells and shallow groundwal ation measures to protect sensitive source water feature. 1.25 1 pective there is no preference for a prevals for the terrestrial component but the potential breeding habitat for Eastern and the protection of the terrestrial component but the potential breeding habitat for Eastern and the protection of th	atternative. One abandoned well is present. a anticipated. ter are anticipated. es are required. 1.75 3 sterred alternative. There is small the differences are small. Alternative Handowlark/Bobolink. 3 equired is comparable for all three alternatives. 0 No impacts as road alignment will not change the state of the study area for th

		0 = no impact	Qualitative assessment of	Operational	Operational	Operational
Socio-Economic	25%	0 = no impact 1 = minor impact 3 = moderate	Qualitative assessment of impacts to air quality and greenhouse gas emissions. N.B. MTO Guide identifies 500 m as the	-Road segment length remains virtually the same, emissions do not increase. Emission increase with expected population growth; not associated	-Road segment length and alignment remains the same, emissions do not increase. Emission increase with expected population growth; not associated with	-Road segment length decreases minimally (by approximately 5m), insignificant decrease in emission Emission increase with expected population growth; r
Environment	25%	impact	distance 'to avoid the need for air quality impact mitigations' in most cases.	with bridge replacementReplacing the bridge to the West brings the road	bridge replacementReplacing the bridge on the same alignment does not	associated with bridge replacementReplacing the bridge to the East brings the road way
		5 = significant impact	'	way minimally closer (approximately 20m at the greatest offset) to one sensitive receptor (a	increase or decrease distances to the sensitive receptors (farms/residences). No impact to emissions	minimally closer (approximately 10m at the greatest of two sensitive receptors (farms/residences), and fu
				farm/residence), and further from two sensitive	as a result of the bridge replacement.	from one sensitive receptor (a farm/residence) to the
				receptors (farms/residences) to the East. Realignment expected to have insignificant	During construction	West. Realignment expected to have insignificant im on emissions overall.
				impact on emissions overall.	-Impacts from option H-2 impact nearby receptors during construction only.	During Construction
				During Construction -Construction emissions from option H-1 are	-Temporary road closure to complete construction may speed up construction timeline; diverts existing	-Construction emissions from option H-3 are increas- the two receptors to the East and decreased at the c
				increased at the one receptor to the West and	road traffic away from the nearby receptors	receptor to the West based on the distance to the
				decreased at the two receptors to the East based on the distance to the realignment. Construction	eliminating a combined construction plus traffic emission scenario.	realignment. Construction emission impacts are only expected through the duration of the construction time.
				emission impacts are only expected through the duration of the construction timeline.	-Bridge closure and road detour increases emissions in the vicinity of the construction zone.	 -No road closure during construction allows continuing bridge traffic while the new one is constructed. This
				-No road closure during construction allows continuing bridge traffic while the new one is		to combined effects of construction emissions plus existing vehicle traffic emissions (operational).
				constructed. This leads to combined effects of construction emissions plus existing vehicle traffic		, ,
				emissions (operational).		
				1	1	1
			Agricultural Resources			
			Impact on local agricultural resources using quantitative measure of area (ha).	south side is classified as Class 2 soils, mea	sified as Class 3 soils, meaning these soils have moder ning these soils have moderate limitations that restrict t ed as agricultural land use in the northwest quadrant du	he range of crops. Potential for minor impacts to lands
			Approved Local, Regional and Provincial Plans and Policies	0	0	0
			Assessment of conformity with approved	The proposed Herley Road bridge replacement of	onforms with the approved local Official Plans, Northum	berland County Transportation Master Plan, and provi
			local, regional and provincial plan and policies.		plans and policies.	,,
Total Socio-E Total Socio-E				2 2	2	1.5
			nvironment Key Aspects		e the preferred alternative is H-3 since i	t has minor property impacts and the
				lowest potential to increase emission	rty impacts. Also from an Air Quality peons.	erspective alternative is H-3 has the
			Traffic Operations and Geometry	3	3	1
			Crossing road geometry, geometry/tie-in o intersecting roads.	existing tangential alignment, and requires adju	ey Road alignment, which is less desirable than the stment to the Honey Road intersection to tie into the ignment.	Existing alignment is maintained which accommoda perpendicular intersection and tangential horizon alignment, which is preferred.
				Easier construction and access to build a new	5 Easier construction and access to build a new	1
			Constructability	alignment offline. Tie-in to existing alignment is more difficult than Alternative 3.	alignment offline. Tie-in to existing alignment is more difficult than Alternative 3.	Simpler construction since the road will be closed replace the structure and the alignment matches ex
			Complexity of construction of structures and crossing road improvements, utility	More difficult construction due to tight curvilinear	More difficult construction due to tight curvilinear	conditions more closely than other alternatives
Transportation		0 = no impact 1 = minor	relocation requirements.	geometrics and not impacting existing structure.	geometrics and not impacting existing structure.	Slight potential for impacting hydro poles on the eas due to grading.
/ Technical Considerations	30%	impact 3 = moderate		Least potential for impacting hydro poles on the east side due to grading.	Highest potential for impacting hydro poles on the east side due to grading.	5
Considerations		impact 5 = significant	Construction Staging	1	1	
		impact	Construction staging impacts, accommodation of traffic during	Dridge is constructed an experte diagrament	which minimizes traffic impacts during construction.	The road will be closed during construction, with detor Percy Street or Lake Road resulting in out-of-way tra
			construction, detour/out-of-way travel requirements, including impacts to	Bridge is constructed on separate alignment,	which minimizes traine impacts during construction.	residents, emergency services, and for access Township of Cramahe water stand pipe.
			emergency services response times.	0	0	0
			Maintenance			
			Maintenance of retaining walls, snow	There are no pr	oposed retaining walls or major snow clearing considera	ations for the alternatives.
			clearing.			
		n / Technica	Considerations Score	2.1	2.7	2.1
		. / Technic	I Considerations Rank	1	3	1
Total Transpo	ortation		chnical Considerations Key	Form a Toronous set of an (Toronous lands of		
Total Transpo Summary of T	ortation		chnical Considerations Key	simpler construction staging becau	erspective, Alternatives H-1 and H-3 are use it can be built on a new alignment a referred geometry, but requires road clo	nd Herley Road can remain open duri
Total Transpo Summary of T	ortation	ortation / Te	chnical Considerations Key Cost Estimate (Parametric)	simpler construction staging becau	ise it can be built on a new alignment a	nd Herley Road can remain open duri
Total Transpo	ortation		Cost Estimate (Parametric) Parametric cost estimate for structures,	simpler construction staging becau construction. Alternative H-3 has p	ise it can be built on a new alignment a referred geometry, but requires road clo	nd Herley Road can remain open durir osure during construction.
Total Transpo Summary of T	ortation	0 = no impact 1 = minor impact	Cost Estimate (Parametric)	simpler construction staging becau construction. Alternative H-3 has pr	ise it can be built on a new alignment a referred geometry, but requires road clo	nd Herley Road can remain open durir osure during construction.
Fotal Transpo Summary of T Aspects	ortation Γransp	0 = no impact 1 = minor impact 3 = moderate impact	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes	simpler construction staging becau construction. Alternative H-3 has pr 3 \$8.0 M	ise it can be built on a new alignment a referred geometry, but requires road clo	nd Herley Road can remain open during construction. 1 \$ 6.5 M Lowest estimated cost because existing alignmen
Fotal Transpo Summary of T Aspects	ortation Γransp	0 = no impact 1 = minor impact 3 = moderate	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging.	simpler construction staging becau construction. Alternative H-3 has pr 3 \$8.0 M	se it can be built on a new alignment a referred geometry, but requires road clo 3 \$ 8.0 M	nd Herley Road can remain open duringsure during construction. 1 \$6.5 M
Fotal Transpo Summary of T Aspects Cost	ortation Fransp	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction	simpler construction staging becau construction. Alternative H-3 has pr 3 \$8.0 M	se it can be built on a new alignment a referred geometry, but requires road clo 3 \$ 8.0 M	nd Herley Road can remain open during sure during construction. 1 \$ 6.5 M Lowest estimated cost because existing alignmen
Fotal Transpo Summary of T Aspects Cost	ortation Fransp 0%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction	simpler construction staging becau construction. Alternative H-3 has pr 3 \$ 8.0 M Highest estimated con	se it can be built on a new alignment a referred geometry, but requires road clo 3 \$ 8.0 M	nd Herley Road can remain open during construction. 1 \$ 6.5 M Lowest estimated cost because existing alignmen maintained.
Fotal Transpo Summary of T Aspects	ortation Fransp 0%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction	simpler construction staging becau construction. Alternative H-3 has printed as \$ 8.0 M Highest estimated confidence of the stage of t	se it can be built on a new alignment a referred geometry, but requires road clo 3 \$ 8.0 M st due to road realignment.	nd Heriey Road can remain open duriosure during construction. 1 \$ 6.5 M Lowest estimated cost because existing alignmen maintained.
Fotal Transpo Summary of T Aspects Cost	over the control of	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Cost Estimate (Parametric) Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction	simpler construction staging becau construction. Alternative H-3 has program in the stage of the	se it can be built on a new alignment a referred geometry, but requires road clo 3 \$ 8.0 M st due to road realignment.	nd Herley Road can remain open during construction. 1 \$ 6.5 M Lowest estimated cost because existing alignmen maintained.

Notes:

1) Each indicator is given a score of 0 = no impact, 1 = minor impact, 3 = moderate impact, 5 = significant impact.
2) Each indicator is given equal weight within its respective criteria.
3) Each of the 4 criteria have different weights.
4) The preferred alternative is chosen based on the least amount of impact (i.e. the closer the overall score is to 0, the better the alternative is).

				HWY 401 WIDENING EVALUATION TA	BLE		SECTION 3
CAITERIA MEIGH	PATIENA SCALE	No _{CA} TOR	S2-1A	S2-2	S2-3	S3-1B	S3-2A
		Alternative Description	Widen inside only	Widen inside in the Interim and outside in the Ultimate	Widen to the north	Widen outside only and widen median shoulders (maintain existing alignment) with retaining walls	Widen outside only and realign using two 1200 m radius curves
			SCORE	SCORE	SCORE	SCORE	SCORE
		Fish & Aquatic Habitat Direct and/or indirect impacts on fisheries, including Species at Risk (SAR).	0 No watercourses iden	0 tified within 30 m of proposed work area; no impacts anticipated as a result	of the proposed work.	Potential impacts to two intermittent watercourses [Little Lake trib. 1, Little Lake trib. 3 (w/in 30 m); low sensitivity] and 1 permanent watercourse (culvert 21-471/C3; high sensitivity with Salmonids).	Potential impacts to two intermittent watercourses [Little Lake trib. 1, Little Lake trib. 3 (w/in 30 m); low sensitivity] and one permanent watercourse (culvert 21-471/C3; high sensitivity with Salmonids).
		Terrestrial Ecosystems	1	1	1	1	3
		Direct and/or indirect impacts on vegetation communities, significant wildlife, wildlife habitat, and movement patterns, including SAR.	Grading limits to impact edge of deciduous woodland and conifer plantation and encroachment toward wetland pond on north side. No significant habitats or species.	Small increase in woodland removal compared to S2-1. Likely encroachment into wetland pond on north side. No significant species or habitats. SAR not present.	Small amount of deciduous woodland and conifer plantation. Removal of portion of wetland pond on north side. No significant species or habitat. SAR not present.	Small amount of vegetation removal from woodland edge. 0.5 ha removal of potential SAR Eastern Meadowlark/Bobolink habitat. Impacts opportunity for wildlife passage through structural culvert	Small amount of vegetation removal from woodland edge. 1.7 ha removal of potential SAR Eastern Meadowlark/Bobolink habitat. Impacts opportunity for wildlife passage through structural culvert.
		Designated Natural	0	0	0	1	1
		Features Direct and/or indirect impacts on Designated Natural Areas, including Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSI), and Provincially Significant Wetlands (PSWs).		No designated natural areas.		Minor intrusion into Natural Heritage System.	Slightly more intrusion into Natural Heritage System and Unevaluated
		Contamination	0	0	0	0	0
	0 = no impac 1 = minor	Number of potentially contaminated properties to be impacted.		No impact.			No impact
Natural	impact	Excess Soil Management	1	1	1	3	5
Environment	3 = moderate impact 5 = significan impact	t Quantity of excess soil subject to O.Reg. 406/19 (relative to other alternatives).	As	shallow excavation cut resulting in relatively low quantities of excess materi	als.	A moderate excavation cut resulting in relatively moderate quantities of excess soil	A significant cut resulting in relatively significant qua
		Erosion and Sediment	1	1	1	3	5
		Control Qualitative measure of impacts to areas with Erosion and Sediment Control concern		A shallow excavation cut, low erosion potential		A moderate excavation cut / high sensitive fishery	A significant cut/ high sensitive fish
			1	1	1	3	1
		Surface Water & Drainage Number of watercourse crossings and impacts to surface water features; Impacts to existing highway drainage systems and ability to provide stormwater management.	All alternatives have the same amount of impervious area from	a drainage analysis perspective and hence the same impacts. Open median In all alternatives there are no watercourses crossings.	n and ditches provide opportunities for stormwater management.	All alternatives have the same amount of impervious area from a drainage analysis perspective. But the retaining walls in alternative 1 prohibits the use of open ditching system and limits the opportunities for stormwater management. In all alternatives there is one watercourse crossing and there are no additional impacts comparing the three different alternatives.	All alternatives have the same amount of impervious area from a drainage analysis perspective. Alter stormwater management facilitie: In all alternatives there is one watercourse crossing and there are no additional ir
			1	1	1	1	1

		Groundwater Qualitative / quantitative assessment of impacts to groundwater. Static Water Levels: not deeper than 3 meters below the ground, Shallow Wells: no deeper than 15 meters below the ground	100% of this alternative i Three wells with a shall Four deep (greater than 15 mbgs) and Po	No watercourses, wetlands, WHPA or ANSI is within this alternative. Two ponds are present within 100 m of this alternative. indicators of potential groundwater upwelling were observed near this altern 100% of this alternative is within an SGRA and HVA. 5% of this alternative is within an IPZ. is within an area of high groundwater susceptibility and 5% is within high su ow (less than 3mbgs) water level are present within this alternative. There at four shallow domestic water supply wells are present within 100 m of this a otential Impacts to four shallow wells and shallow groundwater are anticipat Mitigation measures to protect sensitive source water features are required	rface water susceptibility. re 6 other wells present. ternative. 1 abandoned well is present. ed.	Sixteen w Eight deep	No wetlands, WHPA or ANSI are within this alternative. Three watercourses are present within this alternative. One pond is present within 100 m of this alternative. Zero indicators of potential groundwater upwelling were observed near this alternative. 70% of this alternative is within an SGRA and 80% is within an HVA. 55% of this alternative is within an IPZ. of high groundwater susceptibility, 10% is within moderate groundwater susceptibility and 55% is within an ells with a shallow water level (less than 3mbgs) are present within this alternative. There are 18 other well (greater than 15 mbgs) and eighteen shallow domestic water supply wells are present within 100 m of this Potential impacts to wetlands and the waterbodies are not anticipated. Potential impacts to three watercourses, eighteen shallow wells and shallow groundwater are anticipated. Mitigation measures to protect sensitive source water features are required.
Total Natural E			1.25	1.25	1.25	3.75	4.75
Summary of Na		•	From a Natural Environmental perspective there is n	o preference for a preferred alternative. There are sm	all differences in the woodland and wetland	From a Natural Environment perspective Alternative	S3-1 is preferred since there is a small amount of impact to potential SAR I
Juliana y Grina		•	removals for the terrestrial component but the differ	•			ts with S3-2 an S3-3. Although from a drainage perspective the retaining wa
		Archaeology	3	3	3	3	3
		Impacts to known archaeological features or areas of archaeological potential.	Archaeological potential in all three alternatives is similar and areas of impact will require Stage 2 test pit survey. S2-1 and S2-3 will require comparable level of Stage 2 investigation.	Archaeological potential in all three alternatives is similar; however, this alternative includes a large area at the east end that will require more Stage 2 test pit survey than S2-1 and S2-3.	Archaeological potential in all three alternatives is similar and areas of impact will require Stage 2 test pit survey. S2-1 and S2-3 will require comparable level of Stage 2 investigation.	Archaeological potential is present in all three alternatives. All alternatives include areas of test pit and pedestrian survey. This alternative has less impacts to areas of potential than S3-2 and S3-3.	Archaeological potential is present in all three alternatives. This alternative includes larger areas requiring both test pit and pedestrian survey due to the realignment of Crandall Road and wider grading limits.
		Built Heritage Resources	0	0	0	3	0
	0 = no impao 1 = minor	and Cultural Heritage Landscapes tt Number of impacts to properties designated					
Cultural Environment	impact	under the Ontario Heritage Act (OHA) or listed on municipal Heritage It Registers; number of cultural heritage landscapes displaced or disrupted;	Impact to 1 CHL (439 Crandall Rd) due to property taking/grading. No direct impacts to barn. CHER completed. Property determined not to be a Provincial Heritage Property (PHP).		closer to agricultural landscape/barn. No direct impacts to barn. CHER be a Provincial Heritage Property (PHP).	Impact to 2 CHLs: 12 McDonald Rd visually disrupted due to retaining wall (CHER completed and property determined not to be a Provincial Heritage Property (PHP)), direct impact to Little Lake CHL due to significant change in grade resulting in multiple property impacts.	Impact to 1 BHR (318 Lake Rd), disrupted due to realignment of Crandall Rd and 401 widening. CHER completed for 318 Lake Road. MTO CHRC did not find the property to be a Provincial Heritage Property (PHP).
			0	0	0	0	0
		Impacts to Indigenous lands The extent of Indigenous lands required.		The Williams Treaties First Nations include the Chippewas of Beausoleil, G The Alderville First Nation Reserve is to the north of the study area. There an			The Williams Treaties First Nations include the Chippewas of Beausoleil, Georgina Island, and Rama and t The Alderville First Nation Reserve is to the north of the study area. There are no impacts to Reserve Lands
Total Cultural E	nvironment Sco	ore	0.6	0.6	0.6	1.2	0.6
Total Cultural E	invironment Rar	nk	1	1	1	3	1
Summary of Gu			with heritage potential since a CHER was completed All alternatives require Stage 2 investigations to be	to preference in alternatives since there are no impact I at 439 Crandall Road to determine it not to be a Provice complete. Alternative S2-2 is anticipated to impact movential of the alternatives. The possibility of recovering	rincial Heriage Property (PHP). ore areas that contain archaeological potential; there	this property. Alternative S3-1 has impacts to 2 Culti and 12 McDonald Road were not found to be Provin All alternatives requite Stage 2 investigations to be	e S3-2 and S3-3 are preferred as it disrupts 1 potential heritage property at ural Heritage Landscapes. A CHER was completed for these properties to cial Heritage Properties (PHP). complete. Alternative S3-3 is anticipated to impact more areas that contain reatives. The possibility of recovering archaeological material is equal for a
		Property & Access				Impacts to 15 private properties and 9 accesses (estimated). Minimizes	· ·
				Impacts to 4 private properties.	Impacts to 4 private properties.	impacts to 15 private properties and 3 accesses (estimated). Williamszes	Impacts to 10 private properties and 5 accesses (estimated). Greater impacted area than Alternative 1
		Number of residential and commercial/industrial properties / accesses impacted.	Minor impacts to 4 private properties. Minimizes property impacts relative to other alternatives.	Property impacts are similar to Alternative 1, except for significant property requirement on the south side of the highway.	Property impacts are similar to but slightly greater than Alternative 1. On the north side of the highway there is a smaller offset to existing buildings relative to Alternatives 1 and 2; however there is potential for further mitigation.	Relatively minor property impacts along Highway 401, except for one larger impact northeast of Lake Road and Highway 401. Moderate to significant impacts along McDonald Road due to profile raise required to match Lake Road profile raise.	(approximately 12 ha). Larger property impacts along Highway 401 than Alternative 1 (greater impacts northeast and northwest of Lake Road and Highway 401).
		Noise	3	3	3	5	3
		Number of noise sensitive receptors/areas within 600 m and ability to provide noise mitigation measures (if required).	Residential dwellings located along the Highway 401 closer to this segment to the north; receptors will experience increase in sound levels as a result of the Highway 401 widening. Noise impact is not anticipated to be significant.	Residential dwellings located along the Highway 401 closer to this segment to the north; receptors will experience increase in sound levels as a result of the Highway 401 widening. Noise impact is not anticipated to be significant.	Could potentially increase the sound level at receptors closest to the receptors in this segment, however the change is anticipated to be moderate.	The proposed change will put the alignment closer to the existing residential properties and increase the noise effects.	The proposed changes put the alignment a bit further from the receptor
		Community Facilities	0	0	0	0	0
		Number of cemeteries, schools, places of worship, and recreation centres directly impacted or potentially displaced.	No cemeteries,	schools, places of worship, or recreation centres directly impacted or poter	ntially displaced.	No cemeteries, schools, places of worship, or recreation centres directly impacted or potentially displaced.	No schools, places of worship, or recreation centres directly impacted or potentially displaced. No opera impacted.
		Pacragian and Taurian	0	0	0	0	0
		Recreation and Tourism Features					
		Number of parks and trails directly impacted.	Per the Northumberland County Transportation Master Plan (2017), Northu	umberland County Cycling Master Plan (2014), and the Northumberland Cou within the Section 2 study limits.	unty Official Plan (2016), there are no trail networks or recreational facilities		numberland County Cycling Master Plan (2014), and the Northumberland County Official Plan (2016), the F However, there are no proposed works on the Lake Road underpass so the Highway 401 widening alternative and the country of the
		Air Quality and Climate	1	1	1	1	1
		· · · · · · · · · · · · · · · · · · ·					

		1 . 5	Operational	Operational	Operational	Operational	Operational
		Qualitative assessment of	-Road segment length remains the same, emissions increase	-Road segment length remains the same, emissions increase with	-Road segment length remains the same, emissions increase with	-Road segment length remains the same, emissions increase with	-Road segment length decreases minimally, emissions increase with expected traffic volume increases
<u> </u>	0 = no impact	Qualitative assessment of impacts to air quality and		expected traffic volume increases due to population growth; the addition	expected traffic volume increases; the addition of active traffic lanes may	expected traffic volume increases due to population growth; the addition	due to population growth; the addition of active traffic lanes may decrease the overall emission impact a
<u> </u>	1 = minor	greenhouse gas		of active traffic lanes may decrease the overall emission impact as flow of		of active traffic lanes may decrease the overall emission impact as flow of	
Socio-Economic	impact 3 = moderate	emissions.	emission impact as flow of traffic is improved.	traffic is improvedWidening outside in the ultimate decreases the separation distance from	-Widening to the North decreases the distance from the emission source		-Realignment option S3-2 includes a tighter curve to the highway which can slow traffic and increase emissions.
Environment	impact	N.B. MTO Guide identifies	During Construction	the Northern most emission source to the sensitive receptors (residences)		the separation between the existing highway alignment and numerous	-Realignment option S3-2 increases separation distance to residences on McDonald Rd. (approximately
<u> </u>	5 = significan	nt 500 m as the distance 'to avoid the need for air	-Minor increase in emissions. Construction emission impacts are only	on Crandall Rd; results in minimal increase in emissions. However, road	the same emissions are emitted from a wider source, therefore potentially		30 homes) decreasing emission impact at the residences. Furthermore, road widening improves
<u> </u>	impact	quality impact mitigations'	expected through the duration of the construction phase. Note: existing	widening improves dispersion as the same emissions are emitted from a	decreasing potential impact at residences.	Highway widening encroaches on McDonald Rd. residences resulting in	dispersion as the same emissions are emitted from a wider source, therefore potentially decreasing
<u> </u>		in most cases.	highway operational emissions may be increased during construction phase due to decrease speed enforcement in the construction zone.	wider source, therefore potentially decreasing potential impact at residences.	During Construction	an increase in emissions. However, road widening improves dispersion as the same emissions are emitted from a wider source, therefore potentially	
<u> </u>			-Construction emissions from option S2-1 limited by widening inside lanes		-Minor increase in emissions. Construction emission impacts are only	decreasing potential impact at residences.	~20m; minimal increase in emissions. Crandall Rd. realignment only impacts two receptors near its mos
<u> </u>			only.	During Construction	expected through the duration of the construction phase. Note: existing		Eastern end.
<u> </u>				-Minor increase in emissions. Construction emission impacts are only	highway operational emissions may be increased during construction	During Construction	
<u> </u>				expected through the duration of the construction phase. Note: existing highway operational emissions may be increased during construction	phase due to decrease speed enforcement in the construction zone. -Construction emissions from option S2-3 increased minimally by	 -Minor increase in emissions. Construction emission impacts are only expected through the duration of the construction phase. Note: existing 	During Construction -Minor increase in emissions. Construction emission impacts are only expected through the duration of
<u> </u>				phase due to decrease speed enforcement in the construction zone.	widening to the North, closer in proximity to receptors in the vicinity of the	highway operational emissions may be increased during construction	the construction phase. Note: existing highway operational emissions may be increased during
<u> </u>				-Construction impacts from S2-2 would be greater if the inside is widened		phase due to decrease speed enforcement in the construction zone.	construction phase due to decrease speed enforcement in the construction zone.
<u> </u>				in the interim, and then outside in the ultimate; due to extended		-Construction emissions from option S3-1 increased by widening outside	-Construction emission impact at residences on McDonald Rd. decreased in this option as the
<u> </u>				construction timeConstruction for the widening outside in the ultimate occurs closer to		lanes only and widening median shoulders as a result of the decreased distance between the residences on McDonald Rd. and the existing	separation from the receptors to the construction zone is increased. -Construction emission impacts decreased minimally in this option due to highway segment length
<u> </u>				sensitive receptors (residences) on Crandall Rd. Minor increase in		highway extent.	decrease. However, construction on Crandall Rd realignment increases overall construction period;
<u> </u>				emissions. Construction emission impacts are only expected through the			increasing emission impacts overall.
<u> </u>				duration of the construction phase.			
<u> </u>							
<u> </u>							
<u> </u>			1	1	1	1	3
		Agricultural Resources					
		Impact on local agricultural				Lands within the grading limits of Section 3 are identified as Class 3 soils, meaning that there are moderately severe limitations that limit the range	Lands within the grading limits of Section 3 are identified as Class 3 soils, meaning that there are moder
<u> </u>		resources using	Lands within the grading limits of Section 2 are identified as Class 3 soils.	meaning that there are moderately severe limitations that limit the range of	crops. None of the alternatives impact land designated as agricultural land	of crops. A small portion lands is classified as Class 2 soils to the eastern	
<u> </u>		quantitative measure of		use.		limits of Section 3, meaning that there are moderate limitations that	realigned at Lake Road, this will impact more Class 3 soils than \$3-1. More impacts to lands to the n
<u> </u>		area (ha).				restrict the range of crops. Minor impacts to properties on the north	realignment of Crandall Road compare
<u> </u>						designated as agricultural land use due to the grading limits.	
<u> </u>			0	0	0	0	0
<u> </u>		Approved Local, Regional		•		· ·	·
<u> </u>		and Provincial Plans and					
<u> </u>		Policies					
<u> </u>							
<u> </u>		Assessment of conformity with approved local,	The proposed widening of Highway 401 is in keeping with the North	umberland County Transportation Master Plan policy recommendation PO2	1 "Advocate for additional widening of Highway 401 east of Cobourg".	The proposed widening of Highway 401 is in keeping	g with the Northumberland County Transportation Master Plan policy recommendation PO21 "Advocate for
<u> </u>		regional and provincial plan					
<u> </u>		and policies.					
Total Socio-Eco			1.5	2.5	2	2.5	2.5
Total Socio-Ecor	nomic Environm	ment Rank	1	3	2 2	1	1
	nomic Environm	ment Rank	1		2 2 ared to the other alternatives. Although the impacts	1	1
Total Socio-Ecor	nomic Environm	nent Rank nvironment Key	1	3 1 is preferred as it minimizes property impacts compa	2 2 ared to the other alternatives. Although the impacts	1 From a Socio-Economic perspective Alternative S3-	1 2 is preferred since it has the lowest property impacts and the alignment is
Total Socio-Ecol Summary of Soc	nomic Environm	nent Rank nvironment Key	1 From a Socio-Economic perspective Alternative S2-	3 1 is preferred as it minimizes property impacts compa	2 2 ared to the other alternatives. Although the impacts	1 From a Socio-Economic perspective Alternative S3-	1 2 is preferred since it has the lowest property impacts and the alignment is
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Total Socio-Ecol Summary of Soc	nomic Environm	nent Rank nvironment Key Traffic Operations and	1 From a Socio-Economic perspective Alternative S2- are minor from an Air Quality perspective S2-1 has t	3 1 is preferred as it minimizes property impacts compa	2 2 ared to the other alternatives. Although the impacts	1 From a Socio-Economic perspective Alternative S3- may slightly improve the noise effects. Although the	1 2 is preferred since it has the lowest property impacts and the alignment is
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Transportation / Technical Considerations	0 = no impac 1 = minor impact 3 = moderat impact 5 = significat impact			Similar construction staging impacts for all alternatives.		Maintaining existing highway alignment minimizes construction staging complexity and impacts to traffic. Existing Highway 401 traffic can be maintained during widening. Grade raise of Lake Road and at intersections of Crandall Road and McDonald Road with Lake Road will require some traffic shifting or temporary detours / out-of-way travel. Structure to be replaced in the same location as existing, which results in more difficult construction access than for Alternatives 2 and 3. Short-term closure / detour of Highway 401 traffic may be required for bridge construction and there will be a closure of Lake Road during bridge replacement, with detour via Herley Road (similar for all alternatives).	Highway realignment increases staging complexity. Highway construction staging is significantly more complex than Alternative 1, less complex than Alternative 3. Offline construction as much as possible. A portion of the realigned highway overlapping the existing highway will require traffic shifting to tie in to the existing alignment. Lake Road profile can be maintained, resulting in less staging impacts on Lake Road and at the intersections of Crandall Road and McDondald Road than for Alternative 1. Bridge will require to be overbuilt in order to accomodate existing lanes due to the bridge being replaced prior to highway widering/realignment Easier construction access to new structure than for Alternative 1. Short-term closure / detour of Highway 401 traffic may be required for bridge construction and there will be a closure of Lake Road during bridge replacement, with detour via Herley Road (similar for all alternatives).
		Maintenance Maintenance and serviceability of retaining walls, snow clearing.	This alternative would require median barrier (double steel-beam guide rail or a concete barrier) in the Ultimate condition. High maintenance cost and effort to maintain median barrier and median area.	No median barrier is required for these al	ternatives, which simplifies maintenance.	This alternative uses a retaining wall approximately 500 m long on the north side of the highway, west of Lake Road. Greater maintenance cost and effort for long-term maintenance of retaining walls. May require greater snow clearing effort to remove snow along the lengh of retaining wall.	No retaining walls, which avoids maintenance and snow clearing challenges associated with retaining walls. Slightly longer structure so some additional maintenance costs associated with this.
Total Transportation	ion / Technica	l Considerations	3.6	1.5	0.9	4.8	3
Total Transportation	ion / Technica	Il Considerations	3	2	1	3	1
Summary of Trans Considerations Ke			From a Transportation/Technical perspective, Alterna south, and minimizes potential utility impacts.	ative S2-3 is preferred since it maintains an open med	dian, does not require large fills in the valley on the	From a Transportation/Technical perspective, Altern has less maintenance requirements than Alternative	native S3-3 is preferred since it improves the existing highway geometry, has S3-1.
		Cost Estimate (Parametric) for Interim 6-	1	1	1	1	3
		lane Condition	\$ 7.7 M	\$ 7.7 M	\$ 7.7 M	\$ 22.5 M	\$ 27.3 M
Cost	1 = minor impact 3 = moderate impact	t Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for		The alternatives have the same estimated cost in the Interim condition.		Lowest estimated cost because this alternative maximizes reuse of the existing highway and shortest span structure	Moderate estimated cost, slightly longer structure that Alternative 1.
	Impact	Construction Programming / Planning.					
Total Cost Score	inipatot.	Construction Programming	0	0	0	0	0
Total Cost Rank		Construction Programming / Planning.	0 1	0 1	0 1	0 1	0 2
		Construction Programming / Planning.		1			
Total Cost Rank	Key Aspects	Construction Programming / Planning.	1	1		1	

Notes:

1) Each indicator is given a score of 0 = no impact, 1 = minor impact, 3 = moderate impact, 5 = significant impact.

					SECT	ION 5		SECTION 7
CAITERIA MEIGAFIA	PIERIA SCALE	Notes Top		S3-3A	S5-3B	S5-4B	S7-2B	S7-4B
		Alternative Des	scription	Widen outside only and realign using two 1700 m radius curves	Widen to the south **MTO will be acquiring property beyond ROW in the area of the drumlins but no further environmental impacts since a retaining wall will be used**	Widen inside in the Interim and widen outside in the Ultimate **MTO will be acquiring property beyond ROW in the area of the drumlins but no further environmental impacts since a retaining wall will be used**	West & East end - Widen inside in the Interim and widen outside in the Ultimate	West end - Widen inside in the Interim and widen outside in the Ultimate; East end – Widen inside only
				SCORE	SCORE	SCORE	SCORE	SCORE
		Fish & Aquatic H Direct and/or indii impacts on fisheri including Species (SAR).	rect ies,	Potential impacts to two intermittent watercourses [Little Lake trib. 1, Little Lake trib. 3 (w/in 30 m); low sensitivity] and one permanent watercourse (culvert 21-471/C3; high sensitivity with Salmonids). Upstream (south) side proposed works have potentially larger habitat loss of high sensitivity habitat than other two options. Potential for reinstatement of currently enclosed upstream (north) channel due to realignment of highway.	5 Potential impacts to two reaches of Biddy Creek (culvert 21-474/C6)	5 and branches within 30 m; permanent, coldwater, high sensitivity).	Potential impacts to three intermittent watercourses (Mayhew Creek trib. 1, Mayhew Creek trib. 2, and Mayhew Creek trib. 3; all low sensitivity)	Potential impacts to three intermittent watercourses (Mayhew Creek trib smaller area of work proposed at east end resulting in likelihood of reduce \$7\$
		Terrestrial Ecosy	vstems	3	1	1	1	1
		Direct and/or indi impacts on veget: communities, sigr wildlife, wildlife he movement pattern including SAR.	rect ation nificant abitat, and	Moderate amount of woodland removal. 1.6 ha removal of potential SAR Eastern Meadowlark/Bobolink habitat. Impacts opportunity for wildlife passage through structural culvert.	Woodland edge removal on N/S sides of highway. Lengthening of structural culvert may affect wildlife passage (turtles) opportunity.	Woodland edge removal on N/S sides of highway. Lengthening of structural culvert may affect wildlife passage (turtles) opportunity (ultimate slightly greater than S5-3).	Negligible encroachment into woodland edge. No significant habitat, vegetation and species affected. Butternut (SAR) located on the north side of 1st Avenue approximately 20-25 m from the grading limit which places the works within the protected habitat.	Small encroachment into woodland edge. No significant habitat, vegetation and species affected. Butternut (SAR) located on the north side of 1st Avenue approximately 20-25 m from the grading limit which places the works within the protected habitat.
		Designated Natu		1	1	1	1	1
		Features Direct and/or indir impacts on Desig Natural Areas, inc Environmentally S Areas (ESAs), Arr Natural and Scier Interest (ANSI), a Provincially Signif Wetlands (PSWs	nated cluding Sensitive reas of ntific and ficant	d Wetlands than Alternative 1 (S3-1).	Minor intrusion into Natural Heritage System, evaluated and non-evalu hydri	ated wetlands associated with Biddy Creek. Potential impact to wetland ology.	Negligible encroachment into Brighton Bluffs ANSI, Mayhew	r Creek Significant Natural Area and Natural Heritage System
		Contamination		0	0	0	0	0
	0 = no 1 = mi	Number of potent contaminated pro be impacted.			No ir	npact		No impact
Natural	impact	Evenes Sail Man	agement	5	3	3	3	3
Environment	3 = moimpact 5 = sig impact	nificant Quantity of exces	ss soil	ntities of excess soil.	A moderate excavation cut resulting in re	latively moderate quantities of excess soil	Ar	noderate excavation cut resulting in relatively moderate quantities of excess
		Erosion and Sed	liment	5	5	5	3	3
		Control Qualitative measurempacts to areas Erosion and Sedir Control concern	ure of with	ery	A moderate excavation cut / high se			moderate excavation cut / low sensitive fishery, low to high erosion potent
				1	1	1	1	1
		Surface Water & Drainage Number of water crossings and impacts to existin highway drainage and ability to prov stormwater mana	course pacts to atures; ag e systems	native 2 and 3 have more open space and opportunities to implement s. npacts comparing the three different alternatives.	All alternatives have the same amount of impervious area from a draina ditches provide opportunities In all alternatives there is one watercourse crossing and there a		All alternatives have the same amount of impervious area from	a drainage analysis perspective and hence the same impacts. Open mediar In all alternatives there are no watercourses crossing.
			į	1	1	1	1	1

			Groundwater Qualitative / quantitative assessment of impacts to groundwater. Static Water Levels: not deeper than 3 meters below the ground, Shallow Wells: no deeper than 15 meters below the ground	area of high surface water susceptibility. s present. alternative.	One pond is present with One indicator of potential groundwater upwellir This alternative is not with 50% of this alterna 0% of this alternative is within an area of high groundwater susceptibility within an area of high groundwater susceptibility Two wells with a shallow water level (less the One shallow (less than 15 mbgs) commercial supply well and No impacts to the p Potential impacts to three watercourses, one non-evaluated we Limited mitigation measures to protect se	nd are present within this alternative. n 100 m of this alternative. g was observed within 100 m of this alternative. thin an SGRA or an HVA. tive is within an IPZ. 90% is within an area of moderate groundwater susceptibility and 50% is rface water susceptibility. an 3mbgs) are present within this alternative. 1 shallow test hole are present within 100 m of this alternative. ond are anticipated. Itand, one shallow well and shallow groundwater are anticipated. nsitive source water features are required.	15 100% of this alternative is wi Seven wells with a shal Four shallow (less than 15 mbgs) Potential in	No wetlands or WHPA are present within this alternative. Three watercourses are present within this alternative. One pond is present within 100 m of this alternative or indicators of potential groundwater upwelling were observed near this alternative or indicators of potential groundwater upwelling were observed near this alternative is within an SGRA and 50% is within an HVA. % of this alternative is within an IPZ and 80% of this alignment borders an Althin an area of high groundwater susceptibility and 5% is within an area of high ow water level (less than 3mbgs) are present within this alternative. There are and 20 deep domestic water supply wells are present within this alternative. No impacts to wetlands or the waterbodies are anticipated. No impacts to wetlands or the waterbodies are anticipated. Mitigation measures to protect sensitive source water features are required.
Total Natural Er				5.25	4.25	4.25	3.25	2.75
Summary of Nat		• • • • • • • • • • • • • • • • • • • •	t Kov Aenocte	Eastern Meadowlark/Bobolink habitat and there are	From a Natural Environmental perspective there is n	o profesence in alternatives. There is small	From a Natural Environment perspective Alternative	s S7-4 and S7-5 are equally preferred since Alternative
Summary of Nat	iturar Em	VIIOIIIIIGII	They Aspects	alls in S3-1 do prohibit the use of open ditching	differences in the lengthening of the structural culvo opportunity and it is a slightly greater impact in Alte	ert that may affect wildlife passage (turtles)		ayhew Creek trib. 2, and Mayhew Creek trib. 3; all low
			Archaeology Impacts to known archaeological features or areas of archaeological potential.	Archaeological potential is present in all three alternatives. This alternative includes larger areas requiring both test pit and pedestrian survey due to the realignment of Crandall Road and grading limits wider than both S3-1 and S3-2.	3 Archaeological potential present in both alternatives. Stage 2 test pit	and pedestrian survey areas are comparable for both S5-3 and S5-4.	3 Archaeological potential	present in all three alternatives. Stage 2 test pit survey areas are comparable
	1	= minor	Built Heritage Resources and Cultural Heritage Landscapes Number of impacts to properties designated under the Ontario Heritage	0 Impact to 1 BHR (318 Lake Rd), displaced due to widening.	1	1	1	1
Cultural Environment	20% 3 in 5	= moderate npact = significant npact	Act (OHA) or listed on municipal Heritage Registers; number of cultural heritage landscapes displaced or disrupted;	CHER completed for 318 Lake Road. MTO CHRC did not find the property to be a Provincial Heritage Property (PHP).	Impact to 1 CHL (15154 Telephon	e Rd) due to property taking/grading		Impact to 1 CHL (16536 Telephone Rd) due to property taking/grading
				0	0	0	0	0
			Impacts to Indigenous lands The extent of Indigenous lands required.	he Mississaugas of Alderville, Curve Lake, Hiawatha, and Scugog Island. i.	The study area falls within the boundaries of the 1923 Williams Treaties. Georgina Island, and Rama and the Mississaugas of Alderville, Curve La the north of the study area. There	ke, Hiawatha, and Scugog Island. The Alderville First Nation Reserve is to		The Williams Treaties First Nations include the Chippewas of Beausoleil, G The Alderville First Nation Reserve is to the north of the study area. There are
Total Cultural E				0.6	0.8	0.8	0.8	0.8
Total Cultural E Summary of Cul			nt Key Aspects	1 318 Lake Road, whereas Alternative S3-3 displaces letermine their heritage potential. 318 Lake Road archaeological potential, there is no significant II alternatives.	There is no preference from a Cultural Environment heritage landscape due to property taking/grading. All alternatives require Stage 2 investigations to be potential, there is no significant difference in the arc possibility of recovering archaeological material is expected.	A CHER was not recommended for this property. complete and have the same archaeological chaeological potential of the alternatives. The	CHER was not recommended for this property. All alternatives require Stage 2 investigations to be	perspective as all alternatives impact 1 cultural heritations and have the same archaeological potential similarity of recovering archaeological material is equal
			Property & Access Number of residential and commercial/industrial properties / accesses impacted.	Impacts to 13 private properties and 5 accesses (estimated), including 1 residential displacement. Greater impacted area than Alternative 1 (approximately 12 ha). Most significant property impacts along Highway 401, including large impacts northeast and northwest of Lake Road and Highway 401 and one residential displacement.		a properties (similar for all alternatives). In to place drumlins and erodible soils within future MTO right-of-way.	West end - property impacts are the same as other alternatives (minor impacts on the north and south side of Highway 401). East end - Minor impacts to 8 properties. Property impacts are similar to Alternatives 4 and 5 on the north side, but slightly greater than Alternative 4 on the south side.	
			Noise Number of noise sensitive receptors/areas within 600	3	0	0	3	3
			m and ability to provide noise mitigation measures (if required).	; it may slightly improve the noise effects.	There are no valid receptors iden	ified at this stage for this segment.	There are	receptors on the south side, the effect from these options are similar for all
			noise mitigation measures (if required). Community Facilities Number of cemeteries,	0	0	ified at this stage for this segment. 0 tion centres directly impacted or potentially displaced.	0	0
			noise mitigation measures (if required). Community Facilities Number of cemeteries, schools, places of worship, and recreation centres directly impacted or potentially displaced.	0	0	0	0	0
			noise mitigation measures (if required). Community Facilities Number of cemeteries, schools, places of worship, and recreation centres directly impacted or	0	0 No cemeteries, schools, places of worship, or recrea 0 Per the Northumberland County Transportation Master Plan (2017), Nor	0 tion centres directly impacted or potentially displaced.	0 No cemeteries	O s, schools, places of worship, or recreation centres directly impacted or poter o umberland County Cycling Master Plan (2014), and the Northumberland County high in the Section 7 study limits.

				Operational	Operational	Operational	Operational	Operational
) – no impost	Qualitative assessment of	-Road segment length decreases minimally, emissions increase with	-Road segment length remains the same, emissions increase with	-Road segment length remains the same, emissions increase with	-Road segment length remains the same, emissions increase with	-Road segment length remains the same, emissions increase with
) = no impact 1 = minor	impacts to air quality and	expected traffic volume increases due to population growth; the addition	expected traffic volume increases due to population growth; the addition	expected traffic volume increases due to population growth; the addition of active traffic lanes may decrease the overall emission impact as flow of	expected traffic volume increases due to population growth; the addition of active traffic lanes may decrease the overall emission impact as flow of	
Socio-Economic		mpact	greenhouse gas emissions.	traffic is improved.	traffic is improved.	traffic is improved.	traffic is improved.	traffic is improved.
Environment		3 = moderate	N.B. MTO Guide identifies	-Realignment option S3-3 further increases separation distance to	-Road widening improves dispersion as the same emissions are emitted	-Widening outside in the ultimate decreases the separation distance from		-Widening outside in the ultimate (on the East end) decreases the
		mpact 5 = significant	500 m as the distance 'to	residences on McDonald Rd. (approximately 30 homes) decreasing	from a wider source, therefore potentially decreasing potential impact at	the Northern most emission source to the sensitive receptors (residences		distance from the Northern most emission source to the sensitive
		mpact	avoid the need for air	emission impact at the residences. Furthermore, road widening improves dispersion as the same emissions are emitted from a wider source,	nearby residences/camp grounds.	and camp ground) on Telephone Rd. and Cedardale Rd. However, road widening improves dispersion as the same emissions are emitted from a	Rd. and Coltman Rd. However, road widening improves dispersion as the same emissions are emitted from a wider source, therefore potentially	receptors (residences) on Coltman Rd. However, road widening imp dispersion as the same emissions are emitted from a wider source,
		•	quality impact mitigations'	therefore potentially decreasing potential impact at nearby residences.	During Construction	wider source, therefore potentially decreasing potential impact at the	decreasing potential impact at the residences.	therefore potentially decreasing potential impact at the residences.
			in most cases.	-Realignment option S3-3 involves the realignment of Crandall Rd.	-Minor increase in emissions. Construction emission impacts are only	residences/camp grounds.	•	
				increasing road segment length by ~15m; minimal increase in emissions.	expected through the duration of the construction phase. Note: existing		During Construction	During Construction
				Crandall Rd. realignment only impacts two receptors near its most Eastern end.	highway operational emissions may be increased during construction phase due to decrease speed enforcement in the construction zone.	During Construction -Minor increase in emissions. Construction emission impacts are only	-Minor increase in emissions. Construction emission impacts are only expected through the duration of the construction phase. Note: existing	 -Minor increase in emissions. Construction emission impacts are onlexpected through the duration of the construction phase. Note: existing the construction of the construction phase.
				Zastom ona.	-Construction emission impacts decreased as widening to the South	expected through the duration of the construction phase. Note: existing	highway operational emissions may be increased during construction	highway operational emissions may be increased during construction
				During Construction		highway operational emissions may be increased during construction	phase due to decrease speed enforcement in the construction zone.	phase due to decrease speed enforcement in the construction zone.
				-Minor increase in emissions. Construction emission impacts are only expected through the duration of the construction phase. Note: existing	on Telephone Rd. and Cedardale Rd.	phase due to decrease speed enforcement in the construction zone. -Construction impacts from S5-4 would be greater if the inside is widened	-Construction impacts from S7-2 would be greater if the inside is widened in the interim, and then outside in the ultimate: due to extended	I -Construction impacts from S7-4 would be greater if the inside is wid in the interim, and then outside in the ultimate: due to extended
				highway operational emissions may be increased during construction		in the interim, and then outside in the ultimate; due to extended	construction time.	construction time.
				phase due to decrease speed enforcement in the construction zone.		construction time.	-Construction for the widening outside in the ultimate occurs closer to	-Construction emission impact from West end widening to the inside
				-Construction emission impact at residences on McDonald Rd. further		-Construction for the widening outside in the ultimate occurs closer to	sensitive receptors (residences) on Telephone Rd. and Coltman Rd.	decreased as the separation distance between the receptors (reside
				decreased in this option as the separation from the receptors to the construction zone is increased.		Sensitive receptors (residences and camp ground) on Telephone Rd. and Cedardale Rd. Minor increase in emissions. Construction emission	Construction emission impacts are only expected through the duration of the construction phase.	on Telephone Rd. and the construction zone is increased. -Construction for the widening outside in the ultimate (on the East en
				-Construction emission impacts further decreased minimally in this option		impacts are only expected through the duration of the construction phase.	the construction phase.	occurs closer to sensitive receptors (residences) on Coltman Rd.
				due to highway segment length decrease. However, construction on				Construction emission impacts are only expected through the duration
				Crandall Rd realignment increases overall construction period; increasing				the construction phase.
				lemission impacts overall. 3	1	1	1	1
			Agricultural Resources					
				ely severe limitations that limit the range of crops. A small portion lands is	Lands within the grading limits of Section 5 are identified as Class 3 soils	meaning that there are moderately severe limitations that limit the range of	Class 2 soils are located on the south side of Section 7 on the western	nortion and the eastern limits. Class 3 soils are located on the north si
			resources using quantitative measure of	hat restrict the range of crops. S3-2 and S3-3 require Crandall Road to be		imits of Section 5, meaning that there are moderate limitations that restrict	lands within the Section 7 grading limits is classified as Class 6 soils,	
			area (ha).	th designated as agricultural land use due to the grading limits and the to S3-1.	the range of crops. Similar impacts to lands to the north and sout	hwest designated as agricultural land use due to the grading limits.	meaning these soils have severe lir	mitations that restrict the range of crops. None of the alternatives impa
			, ,					
				0	0	l n	0	0
			Approved Local, Regional	·	, , , , , , , , , , , , , , , , , , ,	•	·	•
			and Provincial Plans and					
			Policies					
			Assessment of conformity		The account of the bound 404 is in transition with the Namburat			
			with approved local,	additional widening of Highway 401 east of Cobourg".		perland County Transportation Master Plan policy recommendation PO21 g of Highway 401 east of Cobourg".	The proposed widening of Highway 401 is in keeping with the North	numberland County Transportation Master Plan policy recommendation
			regional and provincial plan		/ lavosato foi daditional mashing	, or right ay 10 reads of Gobbourg .		
			and policies.					
otal Socio-Eco	onomic I	Environm	ent Score	3	1.25	1.25	1.5	1.5
Fotal Socio-Eco Fotal Socio-Eco	onomic I	Environm	ent Rank	3	1	1	1	1
	onomic I	Environm	ent Rank	a bit further from the noise sensitive receptors and	1 From a Socio-Economic perspective there is no pre	1 ference in a preferred alternative since the property	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspect
otal Socio-Eco	onomic I	Environm	ent Rank	3	1	1 ference in a preferred alternative since the property	1	1 4 is slightly preferred from an Air Quality perspect
otal Socio-Eco Summary of So	onomic I	Environm	ent Rank	a bit further from the noise sensitive receptors and	1 From a Socio-Economic perspective there is no pre	1 ference in a preferred alternative since the property eptors in this section. Although from an Air Quality	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspect
otal Socio-Eco	onomic I	Environm	ent Rank	a bit further from the noise sensitive receptors and	1 From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive reco	1 ference in a preferred alternative since the property eptors in this section. Although from an Air Quality	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspect
otal Socio-Eco ummary of So	onomic I	Environm	ent Rank	a bit further from the noise sensitive receptors and	1 From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive reco	1 ference in a preferred alternative since the property eptors in this section. Although from an Air Quality	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspec
otal Socio-Eco ummary of So	onomic I	Environm	ent Rank	a bit further from the noise sensitive receptors and t at Lake Road.	1 From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive reco	1 ference in a preferred alternative since the property eptors in this section. Although from an Air Quality	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspec
otal Socio-Eco	onomic I	Environm	ent Rank vironment Key	a bit further from the noise sensitive receptors and t at Lake Road.	From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive reciperspective there is a slight preference in S5-3 since 3 Traffic operations and roadside safety are similar for all alternatives.	ference in a preferred alternative since the property eptors in this section. Although from an Air Quality e it has the lowest potential to increase emissions.	1 From a Socio-Economic perspective Alternative S7- The property impacts are similar for all alternatives.	1 4 is slightly preferred from an Air Quality perspec .
otal Socio-Eco ummary of So	onomic I	Environm	ent Rank vironment Key Traffic Operations and Geometry	a bit further from the noise sensitive receptors and t at Lake Road. 0 Proposed curves meet the minimum and desirable radius requirement	From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive receperspective there is a slight preference in S5-3 since 3 Traffic operations and roadside safety are similar for all alternatives. Retaining walls are proposed on the north side to avoid impacts to	1 ference in a preferred alternative since the property eptors in this section. Although from an Air Quality	1 From a Socio-Economic perspective Alternative S7-	1 4 is slightly preferred from an Air Quality perspect. 3 Retaining wall is proposed on the north side to avoid impacts to to
otal Socio-Eco	onomic I	Environm	ent Rank vironment Key Traffic Operations and Geometry Traffic operations on	a bit further from the noise sensitive receptors and t at Lake Road.	From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive reciperspective there is a slight preference in S5-3 since 3 Traffic operations and roadside safety are similar for all alternatives.	ference in a preferred alternative since the property eptors in this section. Although from an Air Quality e it has the lowest potential to increase emissions. 1 Traffic operations and roadside safety are similar for all alternatives.	1 From a Socio-Economic perspective Alternative S7- The property impacts are similar for all alternatives. 1 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives.	1 4 is slightly preferred from an Air Quality perspect.
tal Socio-Eco	onomic I	Environm	ent Rank vironment Key Traffic Operations and Geometry Traffic operations on Highway 401, highway geometry, roadside safety,	3 a bit further from the noise sensitive receptors and t at Lake Road. 0 Proposed curves meet the minimum and desirable radius requirement and widened shoulders are not required. Retaining walls are not proposed which is more desirable from a safety	From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive receperspective there is a slight preference in S5-3 since 3 Traffic operations and roadside safety are similar for all alternatives. Retaining walls are proposed on the north side to avoid impacts to existing drumlins. Harder to tie in to the proposed County Road 30 design which widens one	ference in a preferred alternative since the property eptors in this section. Although from an Air Quality is it has the lowest potential to increase emissions. 1 Traffic operations and roadside safety are similar for all alternatives. Retaining walls are proposed on the north side to avoid impacts to existing drumlins.	1 From a Socio-Economic perspective Alternative S7- The property impacts are similar for all alternatives. 1 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives. Open median is maintained in the Interim and Ultimate conditions.	1 4 is slightly preferred from an Air Quality perspect. 3 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives. Median barrier required in the Ultimate condition, which is less desired.
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tal Socio-Eco	onomic I	Environm	ent Rank vironment Key Traffic Operations and Geometry Traffic operations on Highway 401, highway geometry, roadside safety,	3 a bit further from the noise sensitive receptors and t at Lake Road. 0 Proposed curves meet the minimum and desirable radius requirement and widened shoulders are not required. Retaining walls are not proposed which is more desirable from a safety	From a Socio-Economic perspective there is no pre impacts are similar and no valid noise sensitive receperspective there is a slight preference in S5-3 since 3 Traffic operations and roadside safety are similar for all alternatives. Retaining walls are proposed on the north side to avoid impacts to existing drumlins. Harder to tie in to the proposed County Road 30 design which widens one	ference in a preferred alternative since the property eptors in this section. Although from an Air Quality e it has the lowest potential to increase emissions. 1 Traffic operations and roadside safety are similar for all alternatives. Retaining walls are proposed on the north side to avoid impacts to existing drumlins. Easier to tie in to the proposed County Road 30 design which also widens	1 From a Socio-Economic perspective Alternative S7- The property impacts are similar for all alternatives. 1 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives. Open median is maintained in the Interim and Ultimate conditions.	1 4 is slightly preferred from an Air Quality perspect. 3 Retaining wall is proposed on the north side to avoid impacts to texisting drumlin for all alternatives. Median barrier required in the Ultimate condition, which is less desi
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Transportation / Technical Considerations	0 = no impact 1 = minor impact 30% 3 = moderate impact 5 = significar impact		Most complex highway staging of the alternatives due to major highway realignment. Large portions of the highway and structure can be constructed offline. However, a portion of the realigned highway overlapping the existing highway will require traffic shifting to tie in to the existing alignment (more overlap than Alternative 2). Lake Road profile can be maintained, resulting in less staging impacts on Lake Road and at the intersections of Crandall Road and McDondald Road than for Alternative 1. Bridge will require to be overbuilt (more than Alt. 2) in order to accomodate existing lanes due to the bridge being replaced prior to highway widening/realignment. The new structure can likely be constructed entirely offline (easier to construct than Alternative 2). Easier construction access to new structure than for Alternative 1. Short-term closure / detour of Highway 401 traffic may be required for bridge construction and there will be a closure of Lake Road during bridge replacement, with detour via Herley Road (similar for all alternatives).	Construction staging is slightly more complex since the widening strategy must be transitioned on the curve to tie into the County Road 30 study limits.	Construction staging is slightly simpler since the widening strategy is the same as the County Road 30 design and does not require lane transitions.	Construction staging is slightly simpler since the widening strategy is the same as the strategy to the west.	Construction staging is slightly more complex since the widening strategy must be transitioned on the curve to tie into the strategy to the west.
			3	5	5	3	5
		Maintenance Maintenance and serviceability of retaining walls, snow clearing.	No retaining walls, which avoids maintenance and snow clearing challenges associated with retaining walls. Much longer structure so some additional maintenance costs associated with this.	Both alternatives use two retaining walls, approximat Greater maintenance cost and effort for May require greater snow clearing effort to remove snow a		This alternative uses a retaining wall, approximately 250 m long, on the north side of the highway. Greater maintenance cost and effort for long-term maintenance of retaining walls. May require greater snow clearing effort to remove snow along the lengh of retaining wall or clear snow over the wall.	This alternative uses a retaining wall, approximately 250 m long, on the north side of the highway and would require median barrier in the Ultimate condition. Greater maintenance cost and effort for long-term maintenance of retaining walls. High maintenance cost and effort to maintain median barrier and median area. May require greater snow clearing effort to remove snow along the length of retaining wall or clear snow over the wall.
Total Transportati Score			3.9	4.2	3	1.8	4.2
Total Transportati	tion / Technica	Considerations	2	2	1	1	3
Considerations K	sportation / Te (ey Aspects		s better constructability than Alternative S3-2, and	From a Transportation/Technical perspective, Alterr alternative to the County Road 30 design at the proj		From a Transportation/Technical perspective, Altern the west and at the east limit.	native S7-2 is preferred since it maintains an open med
		Cost Estimate	s better constructability than Alternative S3-2, and				native S7-2 is preferred since it maintains an open med
		Cost Estimate (Parametric) for Interim 6-		alternative to the County Road 30 design at the proj	ect study limit.	the west and at the east limit.	·
Considerations K	0 = no impact 1 = minor impact 3 = moderate impact	Cost Estimate	\$ 29.8 M Highest estimated cost because this alternative has the greatest realignment and longest structure.	alternative to the County Road 30 design at the proj	ect study limit. 1 \$ 23.8 M	the west and at the east limit.	1
Considerations K	0 = no impact 1 = minor impact 3 = moderate impact 5 = significar impact	Cost Estimate (Parametric) for Interim 6- lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. To be used for comparison purposes only. Not to be used for Construction Programming	\$ 29.8 M Highest estimated cost because this alternative has the greatest realignment and longest structure.	alternative to the County Road 30 design at the proj	ect study limit. 1 \$ 23.8 M	the west and at the east limit. 1 \$ 40.2 M Slightly higher estimated cost because retaining wall my be slightly taller	1 \$ 39.9 M
Considerations K	0 = no impact 1 = minor impact 3 = moderate impact 5 = significar impact	Cost Estimate (Parametric) for Interim 6- lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. To be used for comparison purposes only. Not to be used for Construction Programming	\$ 29.8 M Highest estimated cost because this alternative has the greatest realignment and longest structure.	alternative to the County Road 30 design at the proj	tect study limit. 1 \$ 23.8 M The same estimated cost.	the west and at the east limit. 1 \$ 40.2 M Slightly higher estimated cost because retaining wall my be slightly taller than for other alternatives.	1 \$ 39.9 M Slightly lower estimated c
Considerations K	0 = no impact 1 = minor impact 3 = moderate impact 5 = significar impact	Cost Estimate (Parametric) for Interim 6- lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. To be used for comparison purposes only. Not to be used for Construction Programming	\$ 29.8 M Highest estimated cost because this alternative has the greatest realignment and longest structure.	alternative to the County Road 30 design at the proj	the same estimated cost.	the west and at the east limit. 1 \$ 40.2 M Slightly higher estimated cost because retaining wall my be slightly taller than for other alternatives.	1 \$ 39.9 M Slightly lower estimated c
Considerations K Cost Total Cost Score Total Cost Rank	0 = no impact 1 = minor impact 3 = moderate impact 5 = significar impact tt Key Aspects	Cost Estimate (Parametric) for Interim 6- lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. To be used for comparison purposes only. Not to be used for Construction Programming	\$ 29.8 M Highest estimated cost because this alternative has the greatest realignment and longest structure.	alternative to the County Road 30 design at the proj	the same estimated cost.	the west and at the east limit. 1 \$ 40.2 M Slightly higher estimated cost because retaining wall my be slightly taller than for other alternatives. 0 1	1 \$ 39.9 M Slightly lower estimated c

Notes:
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CRITERIA MEIOCH	AITEMS S	CAL	Noc _{aro}	S7-5B
			Alternative Description	West end - Widen inside in the Interim and widen outside in the Ultimate; East end – Widen to the south
				SCORE
			Fish & Aquatic Habitat Direct and/or indirect impacts on fisheries, including Species at Risk (SAR).	1 1, Mayhew Creek trib. 2, and Mayhew Creek trib. 3; all low sensitivity); 1 impacts for Mayhew Creek trib. 2 and Mayhew Creek trib. 3 compared to -2
			Terrestrial Ecosystems	1
			Direct and/or indirect impacts on vegetation communities, significant wildlife, wildlife habitat, and movement patterns, including SAR.	grading limit which places the works within the protected habitat.
			Designated Natural	1
			Features Direct and/or indirect impacts on Designated Natural Areas, including Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSI), and Provincially Significant Wetlands (PSWs).	Negligible encroachment into Brighton Bluffs ANSI. Some encroachment into edge of Mayhew Creek Significant Natural Area and Natural Heritage System
			Contamination	0
		0 = no impact 1 = minor	Number of potentially contaminated properties to be impacted.	
Natural	25%	impact 3 = moderate	Excess Soil Management	3
Environment		impact 5 = significant impact	Quantity of excess soil subject to O.Reg. 406/19 (relative to other alternatives).	soil
			Erosion and Sediment	3
			Control Qualitative measure of impacts to areas with Erosion and Sediment Control concern	ial
				1
			Surface Water & Drainage Number of watercourse crossings and impacts to surface water features; Impacts to existing highway drainage systems and ability to provide stormwater management.	and ditches provide opportunities for stormwater management.
				1

			Groundwater	
			Groundwater	
			Qualitative / quantitative	
			assessment of impacts to groundwater.	ative.
			groundwater.	NSI.
			Static Water Levels: not	h surface water susceptibility.
			deeper than 3 meters	e 21 other wells present.
			below the ground, Shallow Wells: no deeper than 15	Four abandoned wells are present.
			meters below the ground	anticipated.
				·
otal Natural E	nviron	ment Score		2.75
otal Natural E			<u> </u>	1
			t Key Aspects	S7-2 has greater potential impacts to three
ummary or ma			ricy riopodio	sensitivity).
			Archaeology	3
			7 ii o.i.uooiogj	·
			Impacts to known archaeological features or areas of archaeological potential.	for all three alternatives.
			Built Heritage Resources	1
			and Cultural Heritage Landscapes	
			Number of impacts to	
		1 = minor impact	properties designated under the Ontario Heritage	
Cultural	20%			
Environment		impact	municipal Heritage	
		5 = significant impact	Registers; number of cultural heritage	
		Impact	landscapes displaced or	
			disrupted;	
				0
			Impacts to Indigenous lands	
				orgina Island, and Rama and the Mississaugas of Alderville, Curve Lake,
			The extent of Indigenous	
			The extent of Indigenous	e no impacts to Reserve Lands.
			lands required.	e no impacts to Reserve Lands.
- t-1 O-1t1 5			lands required.	
			lands required.	0.8
otal Cultural E	nviror	ment Rank	lands required.	
tal Cultural E	nviror	ment Rank	lands required.	0.8
tal Cultural E	nviror	ment Rank	lands required.	0.8
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tal Cultural E	nviror	ment Rank	e state of the sta	0.8 1 ge landscape due to property taking/grading. A there is no significant difference in the
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Socio-Economic Environment	25%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Qualitative assessment of impacts to air quality and greenhouse gas emissions. N.B. MTO Guide identifies 500 m as the distance 'to avoid the need for air quality impact mitigations' in most cases.	Operational -Road segment length remains the same, emissions increase with expected traffic volume increases due to population growth; the addition of active traffic lanes may decrease the overall emission impact as flow of traffic is improved. -Widening outside in the ultimate (on the East end) decreases the distance from the Northern most emission source to the sensitive receptors (residences) on Coltman Rd. However, road widening improves dispersion as the same emissions are emitted from a wider source, therefore potentially decreasing potential impact at the residences. During Construction -Minor increase in emissions. Construction emission impacts are only expected through the duration of the construction phase. Note: existing highway operational emissions may be increased during construction phase due to decrease speed enforcement in the construction zone. -Construction impacts from S7-5 would be greater if the inside is widened in the interim, and then outside in the ultimate; due to extended construction time. -Construction emission impact from West end widening to the South is increased as the separation distance between the receptors (residences) on Telephone Rd. and the construction zone is decreased. -Construction for the widening outside in the ultimate (on the East end) occurs closer to sensitive receptors (residences) on Coltman Rd. Construction phase.
			Agricultural Resources	1
			Impact on local agricultural resources using quantitative measure of area (ha).	he Section 7, mostly located outside of the grading limits. Majority of the hall portion of Class 5 soils is located at the eastern limits of Section 7, designated as agricultural land use.
				0
			Approved Local, Regional and Provincial Plans and Policies Assessment of conformity with approved local, regional and provincial plan and policies.	"Advocate for additional widening of Highway 401 east of Cobourg".
Total Socio-Eco	nomic	Environme	ent Score	1.5
Total Socio-Eco				1.5
	nomic	Environm	ent Rank	1 as it has the lowest potential to increase emissions.
Total Socio-Eco Summary of So	nomic	Environm	ent Rank	1
Total Socio-Eco Summary of So	nomic	Environm	ent Rank vironment Key	as it has the lowest potential to increase emissions. 3 Retaining wall is proposed on the north side to avoid impacts to the
Total Socio-Eco Summary of So	nomic	Environm	ent Rank vironment Key Traffic Operations and Geometry Traffic operations on	as it has the lowest potential to increase emissions. 3 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives.
Total Socio-Eco Summary of So	nomic	Environme	ent Rank vironment Key Traffic Operations and Geometry	as it has the lowest potential to increase emissions. 3 Retaining wall is proposed on the north side to avoid impacts to the
Total Socio-Eco Summary of So	nomic	Environme	Traffic Operations and Geometry Traffic operations on Highway 401, highway geometry, roadside safety, impacts on emergency	as it has the lowest potential to increase emissions. 3 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives. Open median is maintained in the Interim and Ultimate conditions. Widening strategy is not continuous with the strategy to the west,
Total Socio-Eco Summary of So	nomic	Environme	Traffic Operations and Geometry Traffic operations on Highway 401, highway geometry, roadside safety, impacts on emergency	as it has the lowest potential to increase emissions. 3 Retaining wall is proposed on the north side to avoid impacts to the existing drumlin for all alternatives. Open median is maintained in the Interim and Ultimate conditions. Widening strategy is not continuous with the strategy to the west, requiring lane shifting on the curve.

Transportation / Technical Considerations	30%	0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact		Construction staging is slightly more complex since the widening strategy must be transitioned on the curve to tie into the strategy to the west.
				3
			Maintenance Maintenance and serviceability of retaining walls, snow clearing.	This alternative uses a retaining wall, approximately 250 m long, on the north side of the highway. Greater maintenance cost and effort for long-term maintenance of retaining walls. May require greater snow clearing effort to remove snow along the length of retaining wall or clear snow over the wall.
Total Transpo	tation /	Technical	Considerations	3
Score			Considerations Considerations	3 2
Score Total Transpo	tation /	Technical	Considerations	
Score Total Transpo Rank Summary of T	tation /	Technical	Considerations	2 Jian, is easiest to tie into the widening strategy to
Score Total Transpo Rank Summary of T	tation /	Technical	Considerations Chnical Cost Estimate (Parametric) for Interim 6-	2 dian, is easiest to tie into the widening strategy to
Score Total Transpo Rank Summary of T	tation /	Technical	Considerations Chnical Cost Estimate (Parametric) for Interim 6- Iane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging.	2 Jian, is easiest to tie into the widening strategy to
Score Total Transpor Rank Summary of Ti Consideration Cost	ration / ranspor s Key A	Technical tation / Tec spects 0 = no impact 1 = minor impact 3 = moderate impact 5 = significant	Considerations Chnical Cost Estimate (Parametric) for Interim 6-lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for	2 Jian, is easiest to tie into the widening strategy to 1 \$ 39.9 M Dest than Alternative S7-2.
Score Total Transport Rank Summary of Ti Consideration Cost	ration / ranspor s Key A	Technical tation / Tec spects 0 = no impact 1 = minor impact 3 = moderate impact 5 = significant	Considerations Chnical Cost Estimate (Parametric) for Interim 6-lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction Programming	2 Jian, is easiest to tie into the widening strategy to 1 \$ 39.9 M Dest than Alternative S7-2.
Score Total Transpor Rank Summary of Ti Consideration Cost Total Cost Scot Total Cost Rar	ration /	Technical Tation / Tecspects 0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Considerations Chnical Cost Estimate (Parametric) for Interim 6-lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction Programming	2 Jian, is easiest to tie into the widening strategy to 1 \$ 39.9 M Dest than Alternative S7-2.
Score Total Transport Rank Summary of Ti Consideration Cost	ration /	Technical Tation / Tecspects 0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Considerations Chnical Cost Estimate (Parametric) for Interim 6-lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction Programming	2 Jian, is easiest to tie into the widening strategy to 1 \$ 39.9 M Dest than Alternative S7-2.
Score Total Transport Rank Summary of Tr Consideration Cost Total Cost Scot Total Cost Ran Summary of Cost	owners (a)	Technical Tation / Tecspects 0 = no impact 1 = minor impact 3 = moderate impact 5 = significant impact	Considerations Chnical Cost Estimate (Parametric) for Interim 6-lane Condition Parametric cost estimate for structures, highway infrastructure, and construction staging. *To be used for comparison purposes only. Not to be used for Construction Programming	dian, is easiest to tie into the widening strategy to 1 \$ 39.9 M pst than Alternative S7-2.
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