ANNEXES

ANNEXE A
LISTE LONGUE DES SOUS-FACTEURS

INTERPROVINCIAL CROSSINGS ENVIRONMENTAL ASSESSMENT

ÉVALUATION ENVIRONNEMENTALE DES LIAISONS INTERPROVINCIALES

TABLE DES MATIÈRES

Liste longue des critères d'évaluation

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
8.0 CIRCULATION ET TRANSPORTS				
1. Truck Traffic	This sub-factor measures the forecast truck traffic attracted to the crossing, (veh/day). Crossings that accommodate the most truck traffic are preferred.	✓	veh/day	
2. Movement of Goods	This sub-factor measures the ability of a crossing to accommodate movement of goods. Crossings that accommodate the movement of goods are preferred	X		This is measured under No. 1
3. Ability to accommodate hazardous goods	This sub-factor measures the ability of a crossing to accommodate hazardous materials. Crossings that allow transportation of hazardous materials are preferred. Tunnel alternatives will prohibit the movement of hazardous goods.	✓	Yes/no	
4. Vehicular Traffic Demand	This sub-factor measures the forecast vehicular traffic attracted to the crossing. Crossings that accommodate the most vehicular traffic are preferred.	✓	veh/h (peak hour)	
5. Vehicular Traffic Reductions	This sub-factor measures the forecast vehicular traffic that is removed from the existing crossings.	✓	veh/h (peak hour)	
6. Spacing of Signalized Intersections	This sub-factor measures the safety and capacity of the arterial roadway. The desirable intersection spacing is 400 m. This criteria will measure the number of "future" signalized intersections with spacing less than 400 m.	✓	Good/ Adequate	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
7. Quality of arterial Road Connection	This sub-factor measures the number of private driveways per km located on the arterial road connections. The sub-factor will not include any properties that are measured as buy-outs. Reducing private driveways on arterial roadways is preferred. This sub-factor considers that local uses such as school bus stops, garbage pickup and vehicular traffic entering and existing driveways are not desirable for higher speed arterial roadways.	✓	number/km	
8. Non- motorized modes of travel	This sub-factor measures the ability of a crossing to accommodate non-motorized modes of travel, i.e. walking and cycling. Crossings that accommodate the most alternate modes are preferred. Tunnel alternatives do not accommodate non-motorized modes of travel.	✓	Yes/no	
9. Interprovincial Screenline Level of Service	This sub-factor measures the ability of a crossing to meet the screenline Level Of Service objective (V/C= 0.9). Extent to which any proposed modification to the interprovincial transportation system resolves identified problems.	X		This is measured under No. 5.
10. Network connectivity and continuity	This sub-factor measures the ability of a crossing to connect to the interprovincial transportation system. Alternatives that connect to Highways 148 and 50 to Highways 174, 417 and 416 without using local or collector roads are preferred.	X		All alternatives are considered equal.
11. TDM and TSM optimization	Does the alternative support TDM or make existing crossings more effective as a TSM measure.	X		All alternatives are considered equal.

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
12. Improved modal choice and balanced transportation system	This sub-factor measures the ability of a crossing to improve other mode choices and create a more balanced transportation system.	X		This is measured under Nos. 13, 15 and 8.
13. Quality of connection to provincial highway system	This sub-factor measures the ability of an alternative to provide all movements at the provincial road network. The Moodie Drive alternative provides a no connection from 416 northbound and the Holly Acres Road alternative provides an indirect connection to 416 southbound.	✓	Good/Fair/ Poor	
14. Impacts on the existing or planned urban transportation network	This sub-factor measures the impacts of construction on the existing or planned urban transportation network. Crossings that do not affect existing or planned transportation networks are preferred.	X		All associated affects on transportation infrastructure will be included as part of the alternative (if required)
15. Improved Transit Operations No. of vehicles removed from an existing crossing with transit	This sub-factor measures the ability of an alternative to reduce congestion on corridors where transit operations exist. This will measure a change in travel conditions for the transit lines, in city centres of Ottawa and Gatineau. This will consider the following links: • King Edward Ave (5th and Rideau) – STO lines • Wellington Ave (Portage Bridge and King Edward) – STO lines • Mc Donald Cartier Bridge – STO lines • Alexandra Bridge – STO lines • Portage Bridge – STO and OC Transpo	X	Yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Lis-ted	Measurement	Remarks
	lines • Chaudière Bridge – STO and OC Transpo lines • Champlain Bridge – STO lines • Grebert- Fournier (St Louis and 5th) – STO lines • Taché blvd (Champlain and Portage Bridges) – STO lines Crossings that remove the most vehicular traf-fic from transit corridors are preferred.			
16. Potential transit demand in corridor surroundings (2005 and 2031)	This sub-factor measures the potential demand that is represented by the residents in the sur-roundings of the corridor and that could use an eventual transit service on the new corridor or around it.	X	No. residents within 1 km	
17. Potential attracted transit demand in corridor surround-ings (2005 and 2031)	This sub-factor measures the potential demand that would be attracted in the surroundings of the corridor and that could use an eventual transit ser-vice on the new corridor or around it.	X	No. people employed with-in 1 km	
18. Transit network density in the sur-roundings of the corridor (2008 and information on the 2031 modelled transit network)	This sub-factor will measure the potential transit offer existing in the scenario and will help to define if the new corridor is or is not, an opportunity for a new or existing transit line.	X	No./km	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
19. Modal share of transit in whole region (2005 and 2031)	Global modal share of transit on whole region will help to have a portrait of the transit use in the region.	X	No. of trips	
20. Changes in transit modal share on central inter-provincial trips	Changes in transit modal share on inter-provincial trips (between Gatineau and Ottawa on all existing links) are the transit consequence of the effects the new corridor has on the traffic conditions on the existing inter-provincial central links.	X	No. of trips	
21. Changes in transit modal share on trips going to and coming from the central city areas of Ottawa and Gatineau	Changes in transit modal share on trips to and from central city areas of Ottawa and Gatineau, are the transit consequence of the effects the new corridor has on the traffic conditions in these areas.	X		
22. Transit Travel Time *no bus route across the alternative*	This sub-factor will measure the average transit travel times per transit trip, in the whole study area, for AM peak hour. This criteria measures the effect of the new link on the use and efficiency of the transit network.	✓	Min/trip	
23. Transit Ridership *with no bus route across the alternative*	This sub-factor will measure the transit ridership, in the whole study area. This criteria measures the effect on the use of the transit network.	✓	%	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
24. Transit Travel Time *with transit use of link*	This sub-factor will measure the average transit travel times per transit trip, in the whole study area, for AM peak hour. This criteria measures the effect of the new link on the use and efficiency of the transit network.	✓	min/trip	
25. Transit Ridership *with bus route across the alternative*	This sub-factor will measure the transit ridership, in the whole study area. This criteria measures the effect on the use of the transit network.	✓	%	
9.0 NATURAL ENVIRONMENT				
Species at Risk				
26. Confirmed Fish SAR	This sub-factor measures the number of Species At Risk impacted by the crossing. Corridors that do not impact a fish SAR species are preferred.	✓	number	
27. Fish SAR Potential	Number of species at risk potentially present in the corridor (based on species habitat preferences). Corridors with the least fish SAR potential are preferred.	✓	number	
28. SAR (SARA, SARO, Québec designated)	This sub-factor measures the number of non-fisheries Species At Risk impacted by the Crossing. Corridors that do not impact SAR are preferred.	✓	number	
29. Potential Provincially Significant	Special Concern and unclassified but designated Provincially Rare species in ON and/ or QU.	✓	number	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
Species At Risk				
30. Regionally Significant Species	Regionally rare in Ottawa or Gatineau	✓	number	
9.1 Air Quality/Green House Gases				
31. Total Emission Burden for Criteria Contaminants	This sub-factor measures the total emission for each corridor of each of the criteria contaminants (NO/NO_2, CO, PM_{10}, $PM_{2.5}$ and VOC). The percentage difference between the alternatives and the relative importance to the overall city emission burden will be used to define a score.	✓	tonnes/yr	
32. Total Emission Burden for GHG Contaminants	This sub-factor measures the total emission for each corridor of the Green House Gases (CO_2, N_2O, and CH_4) expressed as CO_2 equivalent tonnes. The percentage difference between the alternatives and the relative magnitude by comparison to the overall city emission will be used to define a GHG score.	✓	tonnes/yr	
33. Local Impact on Residents	This sub-factor will provide a measure of the relative Air Quality and population exposure among the corridors. Two substances will be used as part of the measure: NO_2, which is a direct tailpipe emission and is a pre-cursor to smog formation; and inhalable particulate ($PM_{2.5}$) which derives from roadway dust re-suspension and is of concern to sensitive individuals in urban environments. For each corridor, the number of individuals who	✓	Sensitivity Index	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	are exposed to acceptable (1 person) and poor levels (1 person x 10) of ambient concentration of the contaminants, by the roadway traffic as derived by dispersion modeling.			
9.2 Fisheries and Fish Habitat				
34. Cold Water Fish Habitat Impacted	This sub-factor measures whether an alternative will impact the cold water fish habitat. Alternatives that do not impact the cold water fish habitat are preferred.	X	m^2	For discussion
35. Cool Water Fish Habitat Impacted	This sub-factor measures whether an alternative will impact the cool water fish habitat. Alternatives that do not impact cool water fish habitat are preferred, i.e. Green's Creek.	X	m^2	
36. Warm Water Fish Habitat Impacted	This sub-factor measures whether an alternative will impact the warm water fish habitat. Alternatives that do not impact the warm water fish habitat are preferred, i.e. Ottawa River.	X	m^2	Measured under criteria No. 44.
37. Fish Habitat Features Including Spawning, Rearing, Nursery and Feeding Areas.	This sub-factor measures the area of fish habitat impacted. Crossings that have a no net loss of fish habitat are preferred.	X	m^2	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
38. Extent of aquatic vegetation	Aquatic vegetation is generally used as nursery, rearing, feeding and spawning habitat. It also provides cover to fish.	✓	ha	
39. Confirmed and potential spawning sites within corridor	Fish are dependant on this habitat for reproduction. Crossings with the least number of confirmed and potential spawning sites within corridor are preferred.	✓	No.	
40. Confirmed Nursery Sites	This sub-factor measures the potential impact to fish nursery sites. The crossings that affect the least number of fish nursery sites are preferred.	X	m^2	
41. Confirmed Spawning Sites outside the corridor (within 2 km)	Fish are dependant on this habitat for reproduction. Habitat outside the corridor could potentially be influenced by changes in hydrodynamics or sedimentation pattern.	✓	m^2	
42. Project footprint on fish habitat (outside of aquatic vegetation and floodplain areas)	Project footprint on fish habitat (potential impact on channel morphology, hydrodynamics and sediment transport.	✓	ha	
43. Off-Channel fish habitats – floodplain	This sub-factor measures extent of the floodplain (Riparian and bank vegetation) within the corridor. The crossings with lowest extent are preferred	✓	m^2	
44. River width at a crossing	This sub-factor is a function of the number of piers required to cross the river. This sub-factor will measure the total area of the piers for each crossing. The crossings with the least number of piers in the river or the narrowest crossings are preferred. (less impact on channel morphology, hy-	X	m^2	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	drodynamics and sediment transport)			
45. Off-channel fish habitat – Number (length) of tributaries crossings	Tributaries are generally used as migration corridor to fish nursery, rearing, feeding or spawning habitats.	✓	No. or m	
46. Off-Channel Fish Habitat - Number (or length) of unchannelled tributaries (in a natural state) at the crossing site	This sub-factor describes the number (or length) of tributaries at the crossing site. Crossings that do not impact unchannelled tributaries are preferred. (Channelling of tributaries my potentially affect fish upstream migration to tributaries).	X	No. or m	
47. Shoreline Length	Shoreline length generally increases fish habitat productivity, food availability and habitat cover and structure.	✓	m	
48. In Channel Fish habitat structure – pool extent	This sub-factor measures the extent of pools within the corridor. Pools generally act as thermal refuge and fish concentration areas. The crossings with lesser extent of pools are preferred.	X	m^2	
49. Shoreline Disturbance	Shoreline with low disturbance and the presence of riparian vegetation generally provide more food items, shade and cover to fish	✓	HIGH/ MODERATE/ LOW	
50. Marshes and grass beds	This sub-factor measures the extent of marshes and grass beds that could potentially be affected in the corridor. Crossings with the lowest extent are preferred.	X	m^2	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
9.3 Hydrotechnical				
51. River Hydraulics	This sub-factor measures the impacts of the various crossing alternatives on river hydraulics issues due to the physical influence of the bridge piers and abutments.	✓	Excellent/ Good/ Fair/ Poor	
52. Length of Watercourse Crossings	This sub-factor measures the total length of structures crossing the Ottawa River and other watercourses.	X	km	
53. Water Quality (Surface).	This sub-factor measures the amount of stormwater runoff generated by each alternative using a volume per Rainfall Duration for comparison. The alternative that produces the least amount of stormwater runoff is preferred.	✓	m^3/day	
54. Loss of Floodplain Storage	This sub-factor measures the amount of floodplain storage removed by the alternatives. Alternatives that avoid impacting the floodplain of the Ottawa River are preferred.	✓	m^3	
55. Increased Water Levels	This sub-factor is a measure of the potential for increasing local water levels due to the hydraulic obstruction of the waterway by proposed bridge piers and abutments. Where there is existing flood damage concern, or potential for new or increased flood damages, remedial measures may be necessary to protect against such damages, or additional costs may be incurred in the cross sectional design of the crossing to minimize local water level increase.	X		

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
56. Ice Passage and Jamming Potential:	This sub-factor is a measure of the potential to impact ice passage at the proposed crossing location, in-turn impacting upstream flood levels and potential ice loading on the proposed bridge piers. Where ice conditions are such that the proposed bridge piers will increase the potential for ice jamming, additional costs may be incurred in the design of bridge piers in order to minimize the potential for ice jamming, and to manage potential ice loads on the individual piers. Furthermore, should local ice characteristics be an issue with regard to the operation of the Hull-2 generating station or potential ice jam development, it may be necessary to provide for such considerations in the design of the proposed bridge piers.	X		
57. Scour Potential	This sub-factor is a measure of the potential to impact bed scour potential at the proposed crossing locations due to localized impacts to flow velocity and bed shear. Where scour potential is increased due to the adjusted flow parameters and local bed conditions, efforts may be required to protect the proposed bridge piers and abutments. In areas particularly susceptible to scour, additional costs may be incurred in the design of the piers and their footings.	X		

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
9.4 Terrestrial (non-fisheries natural environment)				
58. Habitat restoration potential.	This sub-factor measures the ability of a crossing to provide habitat restoration potential. Crossings that provide a no net loss of habitat are preferred.	X		For consideration during detail design
59. Natural shoreline	This sub-factor measures the extent of undeveloped shoreline impacted (transitional habitat between terrestrial and wetland); crossings that impact transformed shorelines are preferred	X	length (metres)	Wetland habitat covered elsewhere.
60. Deep Water Wetland Habitat	Open river habitat impacted	X	ha (100 m wide corridor)	This sub-factor includes elements of open water biology
61. Provincially Significant Wetlands (PSW)	This sub-factor measures Ontario PSW and candidate PSW and <u>all</u> Quebec wetlands (including Muskrat Habitat).	✓	ha	Includes significant wetland in Gatineau (e.g. Baie McLaurin).
62. Unclassified wetlands.	This sub-factor measures the area of unclassified wetlands. Crossings that do not impact unclassified wetlands are preferred.	X	ha	
63. Migratory Bird Nesting Impact	Seasonal/ permanent impact on species protected by Migratory Bird Act	X	yes/ no	All alternatives are considered equal.
64. Waterfowl Staging Area.	This sub-factor measures impact on identified waterfowl *wetland* staging areas (including migratory rest areas).	✓	yes/ no area (ha)	Overlap with designated or candidate ANSI in Ontario.
65. Provincially Significant (PS) natural areas and habitat (excluding wetlands)	This sub-factor measures impact on Ontario Areas of Natural and Scientific Interest (ANSIs), candidate PS ANSIs, and Quebec Provincially Significant habitat (rare vegetation, nature re-	✓	ha	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	serves ,Kettle Island).			
66. Regionally Significant natural areas and habitat (excluding wetlands)	This sub-factor measures Regionally designated natural areas including High or Moderate City of Ottawa UNA; High Ottawa NESS; and City of Gatineau designated Woodlands; also Regionally designated rare habitat outside of natural areas (Ottawa NESS data only) and Rockcliffe Airport area potentially impacted by runway expansion.	✓	ha	
67. Provincially Significant Habitat	This sub-factor measures the potential impact to Provincially Significant vegetation and habitat. The crossings that do not impact natural habitat within 100 m of the Provincially Significant habitat (i.e. alvars) are preferred.	X	ha	
68. Regionally Rare Habitat	Measures impact on areas of Regionally designated rare landform/ vegetation (NESS program Identified Ottawa areas)	X	area impacted	
69. Significant Valley lands.	This sub-factor measures the potential impact on ravines and valley bottoms (such as Green's Creek). The crossings that do not impact significant valley lands are preferred.	✓	No. of crossings	
70. Interior Forests	This sub-factor measures the loss of woodland core area (continuous forest beyond 100 m from woodland edge) that increases negative edge effect (light pollution, predation, etc.).	✓	ha	
71. Terrestrial Hydrological Features Impacted	Measures impacts on hydrological features such as seepage zones, springs that contribute to ecological function and diversity.	X	yes/ no	
72. Natural Woodlands	This sub-factor measures undesignated woodland habitat supporting native flora and fauna (native	✓	ha	Area of natural habitat.

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	biodiversity), including supporting hydrological features (seepage zones, springs, etc.) which contribute to ecological diversity.			
73. Inland Wildlife Corridor	This sub-factor measures the potential impact on movement of biota between natural habitat areas (excluding open Ottawa River).	✓	yes/ no	
74. Disturbed Edge of Natural Areas	Measures the disturbed edge within a natural area that may change the non-native flora and fauna within natural habitats.	X	lm	
75. Wildlife Habitat, including, Reptiles, Mammals and Insects, Amphibians and Flora.	This sub-factor measures the potential impact to wildlife habitat, including reptiles, mammals and flora. The crossings that do not impact wildlife habitat, including reptiles and mammals are preferred.	X		Combined with criteria for SAR, native biodiversity, significant valleylands.etc
10.0 CULTURAL ENVIRONMENT:				
10.1 Heritage and Archaeological				
76. Built Heritage sites impacted.	This sub-factor measures the potential impact to built heritage sites. The crossings that do not impact built heritage sites are preferred.	✓	No.	
77. Historic Archaeological potential areas impacted	This sub-factor measures the potential impact areas of historic archaeological. The crossings that do not impact historic archaeological potential are	✓	ha	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	preferred.			
78. Cultural landscape features	This sub-factor measures the potential impact to areas with cultural landscapes such as, waterscapes, roadscapes and railscapes. The crossings that do not impact these views are preferred.	✓	No.	
79. Aboriginal Archaeological potential - High (Federal Lands only)	This sub-factor measures the potential impact to areas of High Aboriginal archaeological potential. The crossings that do not impact areas with High Aboriginal archaeological potential are preferred.	✓	ha	
80. Aboriginal Archaeological potential – Medium (Federal Lands only)	This sub-factor measures the potential impact areas of Medium Aboriginal archaeological potential. The crossings that do not impact these areas are preferred.	✓	ha	
81. Aboriginal Archaeological potential – Low (Federal Lands only)	This sub-factor measures the potential impact to areas of Low Aboriginal archaeological potential. The crossings that do not impact these areas are preferred.	✓	ha	
82. Prehistoric Archaeological potential areas impacted.	This sub-factor measures the potential impact to areas of prehistoric archaeological potential. The crossings that do not impact areas with prehistoric archaeological potential are preferred.	✓	ha	
10.2 Community				
83. Noise impacts.	This sub-factor measures the number of noise sensitive areas that will be affected by sound level increases of greater than 3 dBA.	✓	No.	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
84. Noise impacts to Equestrian facilities	This sub-factor measures the number of equestrian facilities that will be affected by noise level increases of greater than 5 dBA or greater due to a crossing.	X	Yes/no	Sound levels in the vicinity of the NNEP are not anticipated to increase due to the proximity to the Queensway.
85. Vibration impacts.	This sub-factor measures if there will be residences that could be affected by vibration increases due to a Crossing.	✓	No.	
86. Community Cohesion.	This sub-factor measures the impact to adjacent existing communities by widening and or utilizing an existing roadway to accommodate a Crossing. This sub-factor is measured by the length of the crossing in the community.	✓	km	
87. Landscape features, (i.e. rock outcrops).	This sub-factor measures the impact to the form of the landscape to accommodate a Crossing. Crossings which do not impact the landscape features are preferred.	X		Alternatives do not impact existing landscape features. Views and vistas measured under Water Use and Resources.
88. Potentially Contaminated Sites.	This sub-factor measures the potential impact to contaminated sites. The crossings that do not impact potentially contaminated sites are preferred.	✓	No.	
89. Water Wells Impacted	This sub-factor measures the potential impact to water wells. The crossings that the least number of water wells are preferred.	✓	No.	
90. Lighting impacts.	This sub-factor measures the number of residences that will be affected by roadway lighting increases due to a Crossing.	X		Luminaires will use cut-off light fixtures. Visual Intrusion measured separately.
91. Visual Intrusion Bridge	This sub-factor measures the degree of visual intrusion by new structure to a residence within 1 km along the Ottawa River.	✓	No.	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
92. Visual Intrusion Roadway	This sub-factor measures the degree of visual intrusion by new roadway to a residence within 200 m where a new roadway is located closer to a residence.	✓	No. of dwelling units	
93. Impact to the Cumberland Masson Ferry	This sub-factor measures the impact to the Cumberland Masson Ferry. Crossing which do not impact the ferry are preferred. =	✓	Yes/no	
94. Magnetic Field Impact on Montfort Hospital MRI	This sub-factor measures the impact to the Montfort Hospital MRI. Crossing which do not impact the Montfort Hospital MRI are preferred.	✓	Yes/no	
10.3 Recreation				
95. Cycling Facilities.	This sub-factor measures the number of cycling facilities that will be affected by a Crossing. Alternatives that do not impact cycling facilities are preferred.	✓	Yes/no	
96. Andrew Haydon Park	This sub-factor measures the impact to Andrew Haydon Park (Nepean). Alternatives that do not affect the park are preferred.	✓	Yes/no	
97. Riverfront Park	This sub-factor measures the impact to Riverfront Park (Kanata). Alternatives that do not affect the park are preferred.	✓	Yes/no	
98. Petrie Island Stumer Park	This sub-factor measures the impact to Petrie Island Stumer Park (Gloucester). Alternatives that do not affect the park are preferred.	✓	Yes/no	
99. Scenic Parkways	This sub-factor measures the impact to the NCC Parkways. Alternatives that do not impact the parkways are preferred.	✓	Yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
100. Multi Use Pathways	This sub-factor measures whether an alternative will impact the existing Multi Use Pathway system. Alternatives that affect the least amount of the Multi Use Pathway system are preferred.	✓	Yes/no	
101. Impacts to Rockcliffe Air Space and Runway (Aviation Museum)	This sub-factor measures whether an alternative will impact the Rockcliffe air space required for landings and takeoffs and the relocation of the runway to the east. Alternatives that do not affect the runway and air space are preferred.	X	Yes/no	Alternatives do not affect the Rockcliffe airport runway and air space.
11.0 WATER USE AND RESOURCES				
102. Impacts on water purification plants	• Britannia • Lemieux Island • Québec (4). This sub-factor measures a potential effect to the water intake of a water treatment plant within 5 km up river. This potential will be measured as the linear distance from the intake. A greater separation distance is more desirable under this sub-factor. Crossings which do not impact the water purification plants and are greater than 5 km upriver are preferred.	✓	km	The intake protection zone (IPZ-2) for Britannia extends approximately 5 km upstream and 0.5 km downstream (Draft Report: IPZ Delineation for Lemieux Island and Britannia Water Purification Plants, February 2008).
103. Impact on sewage treatment plants	This sub-factor measures the impact to sewage treatment plants. Crossing which do not impact the sewage treatment plants are preferred.	X	Yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Lis-ted	Measurement	Remarks
104. Views or vistas Impacted	This sub-factor measures the degree of modifica-tions to the vista from the Ottawa River shoreline. Vista impact is defined as: Yes: New bridge and new arterial road alignment across the Ottawa River. No: No change (new tunnel crossing). The alternatives that do not impact views on the Ottawa River view is preferred.	✓	Yes/no	
105. Relocation of Sailing Club	This sub-factor measures the impact to the Kanata Sailing Club. Alternatives that do not require relo-cation of the club are preferred.	✓	Yes/no	
106. Sailing Activities	This sub-factor measures the recreational effects to sailing activities on the Ottawa River. • Fragmentation of Boating System. • Ability to provide sail navigability at a ma-rina entrances. • Ability to provide regattas on Lac Deschênes: Course No.2 Olympic Circle Alymer Race Course • Impact to Long Distance Sail Racing. • Impact to sailing and canoeing schools. • Ability to accommodate wind powered craft (non-motorized sail craft). • Number of piers. • Angle of crossing. • Location on Lac Deschênes.	✓		

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	Alternatives that affect sailing activities the least are preferred.			
107. Ability to accommodate float planes.	This sub-factor measures the ability of an alternative to accommodate take off and landing (into the wind (typically westerly) of float planes on the Ottawa River. This sub-factor is measured as present for bridge alternatives and absent for tunnels.	X	Present / Absent	
108. Ability to accommodate water bombers.	This sub-factor measures the ability of an alternative to accommodate take off and landing (into the wind (typically westerly)) by water bombers on the Ottawa River, Lac Deschênes.	X	Yes/no	MNR confirmed no impact.
12.0 SOCIO-ECONOMIC ENVIRONMENT:				
109. Pineview Golf Course	This sub-factors measures the impact to the NCC's golf course. Alternatives that do not impact the Pineview Golf Course are preferred.	X	Yes/no	
110. Camelot Golf Course	This sub-factors measures the impact to the Camelot Golf Course. Alternatives that do not impact the Camelot Golf Course are preferred.	X	Yes/no	
111. Cumberland Curling Club	This sub-factors measures the impact to the Cumberland Curling Club. Alternatives that do not impact the Cumberland Curling Club are preferred.	X	Yes/no	
112. Driving Range	This sub-factors measures the impact to the Driving Range. Alternatives that do not impact the	X	Yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	Driving Range are preferred.			
113. Golf Course in Gatineau	This sub-factors measures the impact to the Gatineau Golf Course. Alternatives that do not impact the Gatineau Golf Course are preferred.	X	Yes/no	
114. Gatineau Airport Runway	This sub-factors measures the impact to the Gatineau Airport runway. Alternatives that do not impact the Gatineau Airport runway are preferred	X	Yes/no	Area abandoned.
115. Potential for business developments.	Existing and forecasted total employment within a 1km buffer along the corridor and within a 3km buffer along the corridor.	X	Total employment (TRANS model input)	Included in the evaluation of economic impacts
116. Potential for residential developments.	Existing and forecasted total population within a 1km buffer along the corridor and within a 3km buffer along the corridor.	X	Total population (TRANS model input)	Included in the evaluation of economic impacts
117. Potential for economic development.	This sub-factor defines the potential for the alternative to provide a positive effect in a new corridor (creating economic activity) considering: • manufacturing / industrial; • commercial / business; • tourism / recreational; • agriculture / mining, / forestry; and • residential and institutional.	X	High / low	Included in the evaluation of economic impacts
118. Potential for support and improvement of the downtown economy (tourism, redevelopment, etc.)	This sub-factor measures the ability of an alternative crossing to redistribute regional through truck traffic away from the King Edward downtown corridor. Although some local truck trips will remain in this corridor, the best alternative will show the maximum reduction of through truck traffic along King Edward.	✓	Number of Trucks	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
119. Potential for industrial and intermodal economic development in the new corridor	This sub-factor measures the ability of an alternative crossing to improve and support the accessibility to existing and planned industrial development areas and intermodal facilities identified in municipal official plans. The best alternative will provide the best proximity to these major employment areas.	✓	Number of Trucks	
120. Potential for Service and Office Economic Development in the new corridor	This sub-factor measures the ability of an alternative crossing to improve and support the accessibility to various office and service development areas identified in municipal official plans. The best alternative will provide the best proximity to these major employment areas.	✓	No. veh.	
121. Travel time savings–personal vehicles and transit	This sub-factor measures the travel time savings for personal cars and trucks generated by a new crossing.	✓	min	Included in the Benefit Costs Analysis
122. Travel time savings – commercial vehicle.	This sub-factor measures the travel time savings for commercial vehicles generated by a new crossing.	✓	min	Included in the Benefit Costs Analysis
123. Vehicles operating cost savings (fuel, maintenance) – personnel cars.	This sub-factor measures the vehicles operating cost savings for personnel cars generated by a new crossing.	✓	$	Included in the Benefit Costs Analysis
124. Vehicles operating cost savings personal cars	This sub-factor measures the vehicles operating cost savings for personal cars generated by a new crossing.	✓	$	Included in the Benefit Costs Analysis
125. Long haul commercial traffic advantages.	This sub-factor measures the advantages of a new crossing on long haul commercial traffic (trucks).	X	High / low	Data to be provided by truck OD survey.

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
126. Agricultural activities.	This sub-factor measures whether an alternative will impact the usable farm land that is part of the NCC's farm unit. Alternatives that divide the farm lands are less desirable because they do not facilitate the easy movement of farm machinery within the farm.	X		No measurable difference: corridors running almost exclusively along existing arterial roads.
127. Recreational activities.	This sub-factor measures the impact to the recreational activities due to loss of a parking/access.	X		No measurable difference.
128. Tourism activities.	This sub-factor measures the impact to the tour operators.	X		No measurable difference: these vehicles travelling mostly during the off peak period, on established route.
129. Fisheries activities.	This sub-factor measures the impact to the sport/commercial fisheries due to loss of a public boat launch.	X		No measurable difference: mitigation measures are mandatory.
130. Loss of Boating Revenue	This sub-factor measures the impact to rental income provided by the leasing of berths/docks to seasonal and transient boaters. Any docks and/or access to docks that are required for transportation right-of-ways or no longer have access to navigable waters have been included in the quantity of lost boating revenue.	X		No measurable difference: only one corridor directly impacted (10).
131. Commercial Loss of Passing-By Traffic.	This sub-factor measures whether a business will have a loss of visibility due to realignment of a roadway due to the new crossing.	X		No significant difference: commuters mostly driving on highways, commercial activities usually concentrated in home or place of work vicinities not impacted

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
132. Provincial, regional and municipal economic policies regarding tourism and recreation.	This sub-factor measures the impact to tourism and recreation policies due to improved and/or reduced access.	X		No measurable difference.
133. Impact to the Cumberland Masson Ferry.	This sub-factor measures whether the Cumberland Masson Ferry will be impacted by reduced traffic volume to the ferry. Alternatives that do not impact the Cumberland-Masson Ferry are preferred.	X		No measurable difference: only one corridor directly impacted.
13.0 LAND USE AND PROPERTY:				
134. Conformity with Official Plan and Other Land Use Strategies	This sub-factor measures the impact to land use and growth management strategies in municipal plans. Those Crossings which conform to existing municipal plans are preferred.	✓	yes/no	
135. Loss of future development.	This sub-factor measures whether a crossing will impact future development, identified in the cities of Gatineau and Ottawa Official Plans. Those Crossings which result in impacts to future subdivisions are less desirable. Crossings that remove the least amount of future development properties are preferred.	✓	yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
136. Loss of Recreational Property	This sub-factor measures whether a crossing will impact recreational property. Crossings that remove the least amount of recreational property are preferred.	✓	yes/no	
137. Residential property required.	This sub-factor measures whether a crossing will impact residential development, identified in the cities of Gatineau and Ottawa Official Plans. Those Crossings which result in impacts to residential property are less desirable. Crossings that remove the least amount of residential property are preferred.	✓	ha	
138. Commercial/industrial property required.	This sub-factor measures whether a crossing will impact commercial/industrial property identified in the cities of Gatineau and Ottawa Official Plans. Those Crossings which result in impacts to commercial /industrial property are less desirable. Crossings that remove the least amount of potential commercial/industrial/ businesses property are preferred.	✓	ha	
139. Loss of Institutional Property	This sub-factor measures whether a crossing will impact institutional property. Those crossings which result in a loss of institutional property are less desirable.	✓	ha	
140. Utility Corridor Relocation	This sub-factor measures whether a crossing will impact existing utility corridors. Those crossings which result in a relocation of a major utility corridor are less desirable.	✓	Yes/no	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
141. Utility Property Required	This sub-factor measures whether a crossing will impact existing utility property. Those crossings which require utility property are less desirable.	✓	ha	
142. Institutional Potential Buyout	This sub-factor measures whether an alternative will remove an existing institutional building. Those Crossings which result in a potential buyout of a institutional building are less desirable.	✓	Number	
143. Residential Potential Buyouts	This sub-factor measures whether an alternative will remove an existing residence. Those Crossings which result in a potential buyout of a residential building are less desirable.	✓	number	
144. Community /recreation facilities property required.	This sub-factor measures whether a crossing will impact community /recreation facilities property identified in the cities of Gatineau and Ottawa Official Plans. Those Crossings which result in impacts to community /recreation facilities property are less desirable. Crossings that remove the least amount of community /recreation facilities property are preferred.	X		Measured under separate sub-factor.
145. Impacts to community access.	This sub-factor measures whether a crossing will impact access to an existing community. Those crossings which result in loss of access to a community are less desirable.	X		Access is maintained
146. Commercial potential buy-out.	This sub-factor measures whether an alternative will remove an existing commercial building. Those Crossings which result in a potential buyout	✓	No.	

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
	of a commercial building are less desirable.			
147. Agricultural property required.	This sub-factor measures whether a crossing will remove an agricultural property. Those Crossings which result in loss of lands under agricultural production are less desirable.	X	ha	Measured under separate sub-factor.
148. Farm land severance.	This sub-factor measures whether an alternative will sever usable farm land. Alternatives that divide the farm lands are less desirable because they do not facilitate the easy movement of farm machinery within the farm.	✓	ha	
149. Agricultural potential buy-out.	This sub-factor measures whether a crossing will require an agricultural property buyout. Those Crossings which result in the buy-out of an agricultural property are less desirable.	✓	No.	
150. Loss of major recreational areas.	This sub-factor measures whether a crossing will require major recreational property. Those Crossings which result in loss of major recreational facility property are less desirable.	X	No.	Measured under recreation facilities
151. Agricultural Property (Protected Quebec) Required	This sub-factor measures whether a crossing will remove a agricultural property protected in Quebec. Those Crossings which result in loss of lands under agricultural production are less desirable.	✓	ha	
152. Loss of Class 1, 2, and 3 Agricultural Lands	This sub-factor measures the amount of agricultural land with soil capability of Class 1 to 3 that is required for each alternative. Class 1 to 3 are considered to be provincially significant agricultural resource lands. Crossings that remove the least amount are preferred.	X	ha	Measured under other sub-factors.

Factors and Sub-factors	Definition	Sub-factors Short Listed	Measurement	Remarks
153. Number of Potentially Contaminated Sites	This sub-factor measures whether a crossing will severe the Greenbelt. Those Crossings which result in severance of the Greenbelt are less desirable.	✓	number	
154. Area of Severed Greenbelt (Crossings 6 and 7 to the Rockcliffe Parkway)	This sub-factor measures the area of Greenbelt that would be severed by new transportation corridors dividing it from the larger land mass, The alternatives which generally stay at the periphery of the Greenbelt and sever the least amount of area are preferred.	✓	ha	
155. Agricultural Property required (ON Greenbelt)	This sub-factor measures whether a crossing will remove a agricultural property in Ontario. Those Crossings which result in loss of lands under agricultural production within the Greenbelt are less desirable.	✓	ha	
14.0 COSTS:				
156. Capital, operating, and maintenance costs.	This sub-factor measures the difference in property, capital, operating and maintenance costs between the crossing alternatives.	✓	$	
157. Future maintenance and operating life cycle costs.	This sub-factor measures the difference in life cycle costs between the crossing alternatives.	✓	$	

Sous-facteurs issus de SCP2				
1. Connectivité et circulation à l'échelle régionale (c.-à-d., possibilité d'intégration à la stratégie de phasage d'une éventuelle autoroute périphérique)				Se référer à l'article 13
2. Intégration aux stations existantes du réseau de transport en commun (p. ex. carrefour Bayshore)				Se référer à l'article 15
3. Incidences sur l'achalandage des grands axes de circulation (p. ex. 174, 417, Queensway, 416)				Se référer à l'article 4
4. Incidences sur la circulation sur le réseau routier municipal (rues locales, collectrices et artères) à proximité des corridors				Se référer à l'article 5

proposés				
5. Possibilité de rediriger la circulation des camions de manière à éviter les ponts existants situés dans le secteur central				Se référer à l'article 1
6. Possibilité d'améliorer l'accès aux aéroports régionaux (p. ex., l'aéroport de Gatineau)				Se référer à l'article 13
7. Possibilité de répondre aux besoins des services d'urgence liés aux aéroports				Se référer à l'article 13
8. Possibilité d'accueillir les détournements d'urgence de vols à destination de l'Aéroport international d'Ottawa				Se référer à l'article 13
9. Incidences sur les temps de déplacement des migrants journaliers (voitures particulières et transport en				Se référer à l'article 5

commun) de l'ensemble des résidents de la région				
10. Possibilité d'intégration aux stratégies futures de transport en commun interprovincial et d'améliorer la circulation des véhicules de transport collectif circulant entre le Québec et l'Ontario				Se référer à l'article 15
11. Incidences sur l'infrastructure de transport existante (c.-à-d., effets sur la vitesse de détérioration)				Se référer à l'article 156
12. Possibilité d'aider à favoriser une éventuelle diminution à long terme de la circulation automobile (horizon de 50 ans)				Se référer à l'article 4
13. Possibilité d'accroître la continuité des ré-				Se référer à l'article 8

seaux cyclables et piétonniers				
14. Possibilité de diminuer la circulation des camions par l'accroissement de l'utilisation du transport ferroviaire entre Montréal et Ottawa				Se référer au mémoire technique
15. Possibilité de mieux desservir les communautés rurales et les zones d'aménagement futur par une nouvelle liaison				Se référer à l'article 13
16. Possibilité de mieux desservir les zones aménagées existantes par une nouvelle liaison				Se référer à l'article 4
17. Incidences sur la piste du Musée national des sciences et de la technologie (Musée de l'aviation) [accord de prolon-				Se référer à l'article 101

gement de la piste existante]				
18. Incidences sur l'aérodrome de Rockcliffe (NOTE : la marge de franchissement d'obstacles minimale est de 20:1)				Se référer à l'article 101
19. Incidences sur la partie praticable pour la voile de ce tronçon de la rivière des Outaouais				Se référer à l'article 106
20. Prévoir les dégagements requis pour l'entretien des voies navigables (c.-à-d., le dégagement vertical requis par les embarcations)				Se référer à l'article 106
21. Incidences sur le champ de tir et le centre de formation primaire Connaught (Riddell)				Se référer à l'article
22. Ampleur des améliorations d'infrastructure requises en plus de				Se référer à l'article 156

la liaison en tant que telle (p. ex., ajout d'une nouvelle rampe d'accès au carrefour 417 et promenade de l'Aviation et travaux de paysagement, advenant le choix de la solution Île Kettle)				
23. Sécurité des piétons à l'intérieur et en bordure des corridors				Se référer aux normes de conception du MTO, du MTQ, de la Ville d'Ottawa et de la Ville de Gatineau
24. Possibilité de pourvoir aux besoins de sécurité des activités récréatives se déroulant dans les parcs municipaux (p.ex., le parc Andrew Hayden, l'Île Petrie)				Se référer aux articles 96, 97 et 98
25. Sécurité de tous les utilisateurs du réseau routier (piétons, cyclistes et automobilistes)				Se référer aux normes de conception du MTO, du MTQ, de la Ville d'Ottawa et de la Ville de Gatineau
26. Effets nuisibles potentiels sur la san-				Se référer à l'article 9.1

té causés par l'accroissement des émissions de GES				
27. Ampleur des impacts d'un déversement de marchandises dangereuses dans la rivière des Outaouais				Se référer aux normes de conception du MTO, du MTQ, de la Ville d'Ottawa et de la Ville de Gatineau
28. Incidences sur le périmètre de sécurité du champ de tir et le centre de formation primaire Connaught (Riddell)				Se référer à l'article 139
29. Conformité aux dispositions de la Loi sur la protection des eaux navigables gérée par Transports Canada (p. ex., dégagement requis pour les grands voiliers)				Se référer aux directives de Transports Canada relatives à la protection des eaux navigables.
30. Aptitude à composer avec les crues centenaires.				Se référer à l'article 9.3

31. Incidences sur les activités récréatives (p.ex., le parc Andrew Hayden, l'Île Petrie, les clubs de voile, etc.)				Se référer à l'article 144
32. Incidences liées au bruit (p.ex., le bruit se reflétant sur la surface de l'eau, etc.)				Se référer à l'article 83
33. Effets nuisibles sur les collectivités locales limitrophes découlant de l'aménagement d'ouvrages anti-bruit				Se référer aux exigences des villes d'Ottawa et de Gatineau en matière d'atténuation du bruit
34. Effets nuisibles sur les collectivités locales découlant de la circulation				Se référer à l'article 86
35. Incidences sur les terres riveraines en bordure de la rivière des Outaouais (impacts culturels, environnementaux et communautaires)				Se référer à l'article 78

36. Incidences sur les établissements institutionnels (écoles, églises, hôpitaux, etc.)				Se référer aux articles 142 et 139.
37. Possibilité d'accroissement de l'activité criminelle				Jugé égal pour toutes les options
38. Incidences sur les valeurs foncières résidentielles des résidences				Trop difficile à quantifier
39. Incidences sur la qualité de l'air				Se référer à l'article 9.1
40. Incidences sur la faune				Se référer à l'article 9.0
41. Incidences sur les habitats (le flamant rose égaré)				Se référer à l'article 64
42. Incidences sur la diversité biologique				Se référer à l'article 9.4
43. Incidences sur les cours d'eau secondaires (ruisseaux) à proximité des corridors de liaison				Se référer à l'article 52

44. Incidences sur les terres riveraines sensibles en bordure de la rivière des Outaouais				Se référer à l'article 59
45. Approbation des autorités environnementales				Égal pour toutes les options
46. Incidences potentielles sur l'eau potable (prendre note de l'emplacement des usines de purification de l'eau);				Se référer à l'article 89
47. Incidences sur certaines espèces (p.ex., le lépisosté osseux)				Se référer à l'article 9.0
48. Incidences sur les activités de la réserve faunique gouvernementale de Shirley's Bay				Se référer aux articles 142 et 139
49. Incidences sur les droits conférés aux Indiens dans le cadre du traité incluant le secteur Rockcliffe				Jugé égal pour toutes les options
50. Incidences sur les programmes d'enseignement				Se référer aux articles 139 et 142

(Centre de la jeunesse Terry Fox - 1805, avenue Gaspé, dans le quartier Manor Park – à proximité de l'option Île Kettle)				
51. Accroissement potentiel de la demande pour de nouveaux aménagements urbains à proximité du corridor retenu				Se référer à l'article 134
52. Incidences sur le tourisme dans la région de la capitale nationale				Se référer à l'article 118
53. Emprises déjà protégées en partie par les autorités gouvernementales				Se référer à l'article 139
54. Possibilité de répondre à l'expansion du milieu urbain				Se référer à l'article 117
55. Faisabilité de la construction des solutions de rechange proposées				Jugé égal pour toutes les options

56. Coûts d'infrastructure liés aux nouvelles structures d'approche				Se référer à l'article 156
57. Avantages-coûts per capita				Se référer à l'article 156
58. Longueur de la traversée				Se référer à l'article 156 ou 52
59. Possibilité d'aménager la liaison par étapes				À évaluer dans le cadre de la conception détaillé
60. Coûts d'aménagement préliminaires du pont				Se référer à l'article 156
61. Différence de hauteur entre les berges et le niveau de l'eau				À évaluer dans le cadre de la conception détaillé