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### 5.2.2.7 Pautois Creek Area Realignment Alternatives

From west of Pautois Creek to the east study limit, two widening alternatives were generated, each with a service road and an interchange at Boundary Road, as shown on **Exhibits 5.15** and **5.16**.

On the basis of the assessment and evaluation results presented in **Exhibit 5.17, Alternative 2**, which includes widening of the highway to the south with existing Highway 17 maintained as a service road on the north side, is recommended in the Pautois Creek area as it:

- Results in least impacts to Natural Environment (woodlands and wildlife habitat);
- Results in least impacts to Socio-Economic Environment (provincial parks);
- Has a lower construction cost;
- Results in less complex construction staging and traffic maintenance during construction relative to the north side widening alternative; and
- Is equally preferred relative to other alternatives from a Cultural Environment and Transportation perspective

**Exhibit 5.15: Alternative 1 Pautois Creek Area - North Side Widening**

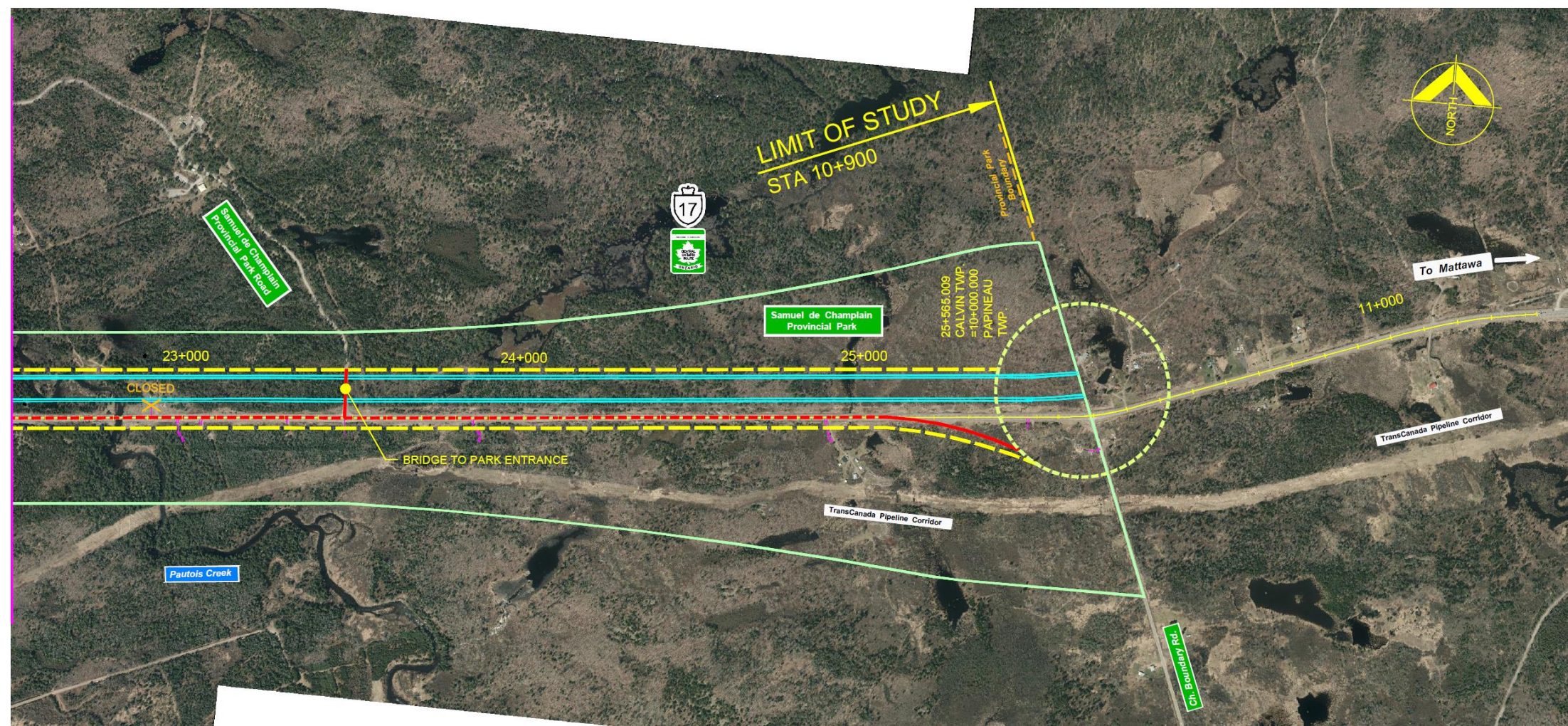




Exhibit 5.16: Alternative 2 Pautois Creek Area - South Side Widening

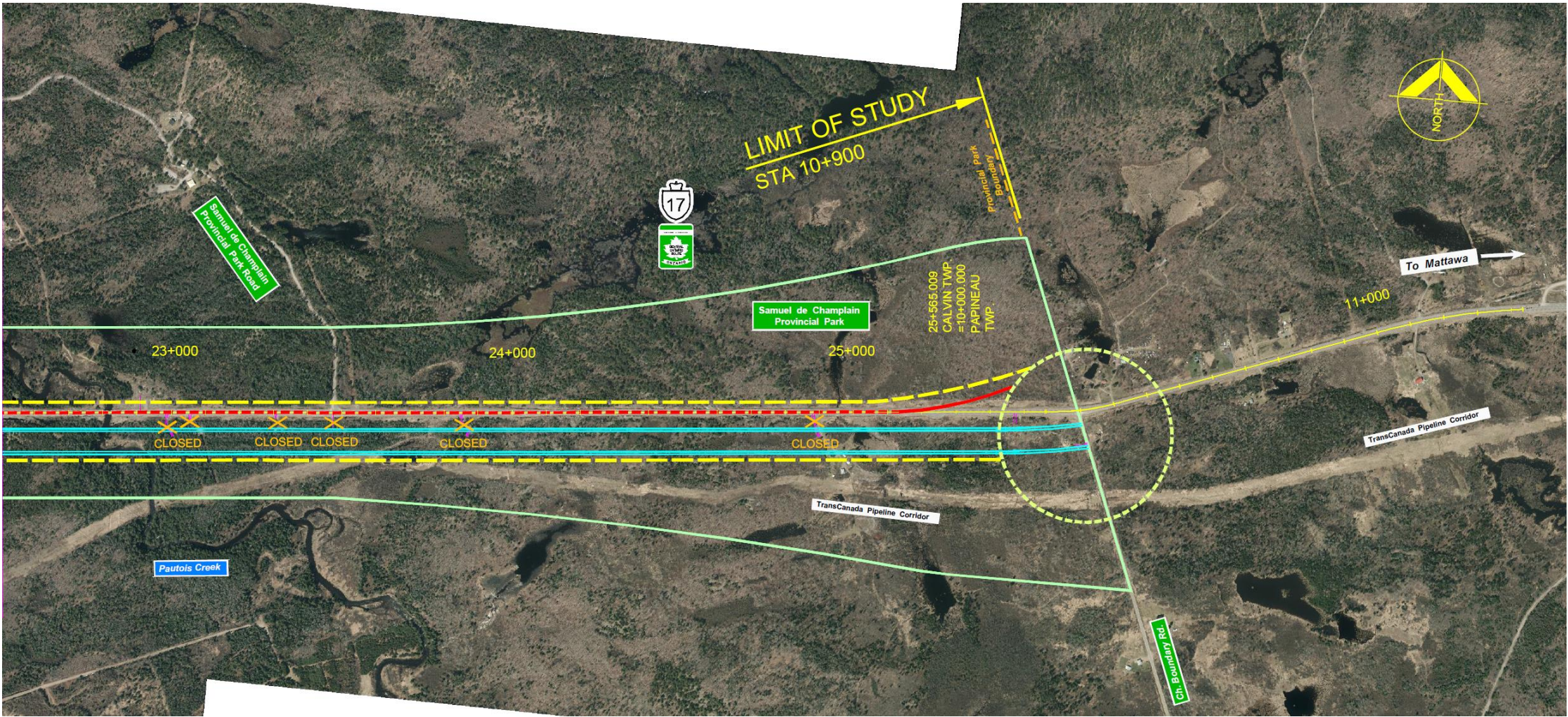




Exhibit 5.17: Evaluation of Pautois Creek Area Realignment Alternatives

Factor Criteria	Indicators	Alternative 1 North Side Widening	Alternative 2 (Preferred) South Side Widening
Natural Environment			
Fish and fish habitat	1. Number of watercourses / waterbodies crossed	▪ 1 crossing of Pautois Creek (significant meandering of creek in close proximity to existing Highway 17)	▪ 1 crossing of Pautois Creek (
	2. Number of watercourses / waterbodies crossed with fish habitat / Species at Risk (SAR)	▪ No known spawning areas (though highly likely given Creek is a tributary to the Amable du Fond River system)	▪ No known spawning areas (though highly likely given Creek is a tributary to the Amable du Fond River system)
Designated Areas	3. Amount (ha) of significant vegetation displaced (Significant Valleylands, ESAs, ANSIs, or other areas of provincial, regional or local significance)	▪ 0 ha	▪ 0 ha
Vegetation	4. Area (ha) of woodland displaced	▪ 37.9 ha	▪ 33.4 ha
	5. Number of known vegetative SAR within the ROW	▪ 1	▪ 1
Wetlands	6. Amount (ha) of wetlands displaced <i>(note: all wetlands in the study area are Unevaluated designation)</i>	▪ 5.4 ha	▪ 5.8 ha
Wildlife and wildlife habitat	7. Amount (ha) of known significant wildlife habitat areas and travel corridors displaced	▪ 59.68 ha (deer yard)	▪ 53.5 ha (deer yard)
	8. Amount (ha) of known habitat for known SAR or of conservation concern displaced	▪ 0 ha	▪ 0 ha
Groundwater	9. Amount (ha) of known groundwater recharge and discharge areas displaced	▪ 0 ha	▪ 0 ha
Water Wells	10. Number of water wells displaced / within 150m	▪ 2 within 150m	▪ 1 within 150m
Natural Environment Summary		Alternative 2 is preferred as it results in the least impacts to woodlands and wildlife habitat areas and comparable impacts for other criteria.	
Socio-Economic / Land Use			
Residential	11. Number of residential homes displaced <i>(note: no designated residential lands (as per Official Plan) impacted by any alternative)</i>	▪ 3 homes, 2 secondary structures	▪ 4 homes, 4 secondary structures
Commercial / industrial	12. Number of commercial / industrial buildings displaced <i>(note: no designated commercial / industrial lands (as per Official Plan) impacted by any alternative)</i>	▪ 0	▪ 0
Agriculture	13. Amount (ha) of Canada Land Inventory Class 1, 2 and 3 soils displaced	▪ 0 ha	▪ 0 ha
	14. Number of agricultural buildings displaced	▪ 0	▪ 0
Provincial parks	15. Amount (ha) of provincial parks impacted / displaced	▪ 32.9 ha	▪ 1.2 ha
Community/ recreational/ tourist facilities	16. Number of community / recreational facilities / tourist attractions impacted	▪ 0	▪ 0
	17. Number of trail crossings (canoe, snow mobile, pedestrian) impacted	▪ 0	▪ 0
Contaminated properties/ waste management	18. Number of operating and "non-operating" waste disposal sites impacted	▪ 0	▪ 0
Highway noise	19. Number of noise sensitive areas within 600 m of the ROW	▪ 8	▪ 8
Air quality	20. Number of sensitive receptors within 600 m of the ROW	▪ 8	▪ 8
Aggregates and mineral resources	21. Amount (ha) of mineral and mineral aggregate resources impacted / displaced	▪ 2.3 ha	▪ 8.9 ha



Exhibit 5.17: Evaluation of Pautois Creek Area Realignment Alternatives

Factor Criteria	Indicators	Alternative 1 North Side Widening	Alternative 2 (Preferred) South Side Widening
Socio-Economic/ Land Use Summary		Alternative 2 is preferred as it results in one less residential displacement, the least impacts to provincial parks and comparable impacts for other criteria.	
Cultural Environment (Preferred)			
Built heritage and cultural landscapes	22. Number of designated / locally significant built heritage features / cultural heritage landscapes impacted	▪ 0	▪ 0
Archaeology	23. Amount (ha) of land with archaeological potential affected	▪ 68.8 ha	▪ 63.4 ha
Cultural Environment Summary		Alternatives are equally preferred	
Transportation			
Accommodation of long term planning objectives	24. Potential to accommodate long term planning objectives and support the efficient movement of people and goods between communities and regions	▪ High	▪ High
Accommodation of projected traffic demand	25. Potential to address the transportation problems and opportunities	▪ High	▪ High
Enhancement of safety	26. Potential to improve safety	▪ High	▪ High
Traffic operations on municipal roads and intersections	27. Number of crossings of local / municipal roads	▪ 1	▪ 1
	28. Number of private accesses impacted	▪ 1	▪ 6
Design consistency with geometric standards for Ontario	29. Consistency with geometric design standards	▪ High	▪ High
Travel time / out of way travel	30. Potential for increased travel time / out of way travel	▪ Low	▪ Low
Transportation Summary		Alternatives are equally preferred	
Cost			
Construction cost (considering utility relocation, amount of property required, rail crossings, etc)	31. Dollars	▪ \$36 million	▪ \$31 million
Cost Summary		Alternative 2 is preferred as it has a lower construction cost.	
Constructability			
Existing traffic flow and operations accommodated during construction	32. Complexity of staging and traffic flow maintenance during construction	▪ Moderate complexity of staging and traffic flow maintenance during construction given that the transition point to east realignment alternatives will cross the existing Highway 17 corridor	▪ Low complexity of staging and traffic flow maintenance during construction as traffic can be maintained on the existing highway during construction of the widened highway segment
Availability of staged construction			
Constructability Summary		Alternative 2 is preferred as the associated construction staging and traffic maintenance is less complex relative to North Side Widening Alternative.	



Exhibit 5.17: Evaluation of Pautois Creek Area Realignment Alternatives

Factor Criteria	Indicators	Alternative 1 North Side Widening	Alternative 2 (Preferred) South Side Widening
Overall Summary and Recommendation		<p>Alternative 2 was recommended as it:</p> <ul style="list-style-type: none"><li>• Results in least impacts to Natural Environment (woodlands and wildlife habitat).</li><li>• Results in least impacts to Socio-Economic Environment (residential displacements and provincial parks).</li><li>• Has a lower construction cost.</li><li>• Results in less complex construction staging and traffic maintenance during construction relative to other alternatives.</li><li>• Is equally preferred relative to other alternatives from a Cultural Environment and Transportation perspective.</li></ul>	



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#### 5.2.2.8 Interchange Alternatives

In addition to alternatives for the mainline of the highway, design alternatives were generated for interchange configurations at three locations: Rutherglen Line; Highway 630; and Boundary Road. Alternative configurations for each interchange location were generated and comparatively evaluated using the same criteria developed to assess highway planning alternatives in order to identify a recommended configuration at each location as detailed below.

##### **Rutherglen Line Interchange Alternatives**

Three interchange alternatives were generated for the Rutherglen Line location as shown in **Exhibits 5.18, 5.19 and 5.20**.

On the basis of the assessment and evaluation results presented in **Exhibit 5.21, Alternative 3** is recommended as it:

- Results in least impacts to Natural Environment (woodland area);
- Results in least impacts to Socio-Economic Environment (agriculture);
- Results in least impacts to Cultural Environment (archaeology);
- Has a lower construction cost; and
- Is equally preferred relative to other alternatives from a Transportation and Constructability perspective.



Exhibit 5.18: Rutherglen Line Interchange Alternatives – Alternative 1

Alternative 1  
Parclo A-4 Configuration

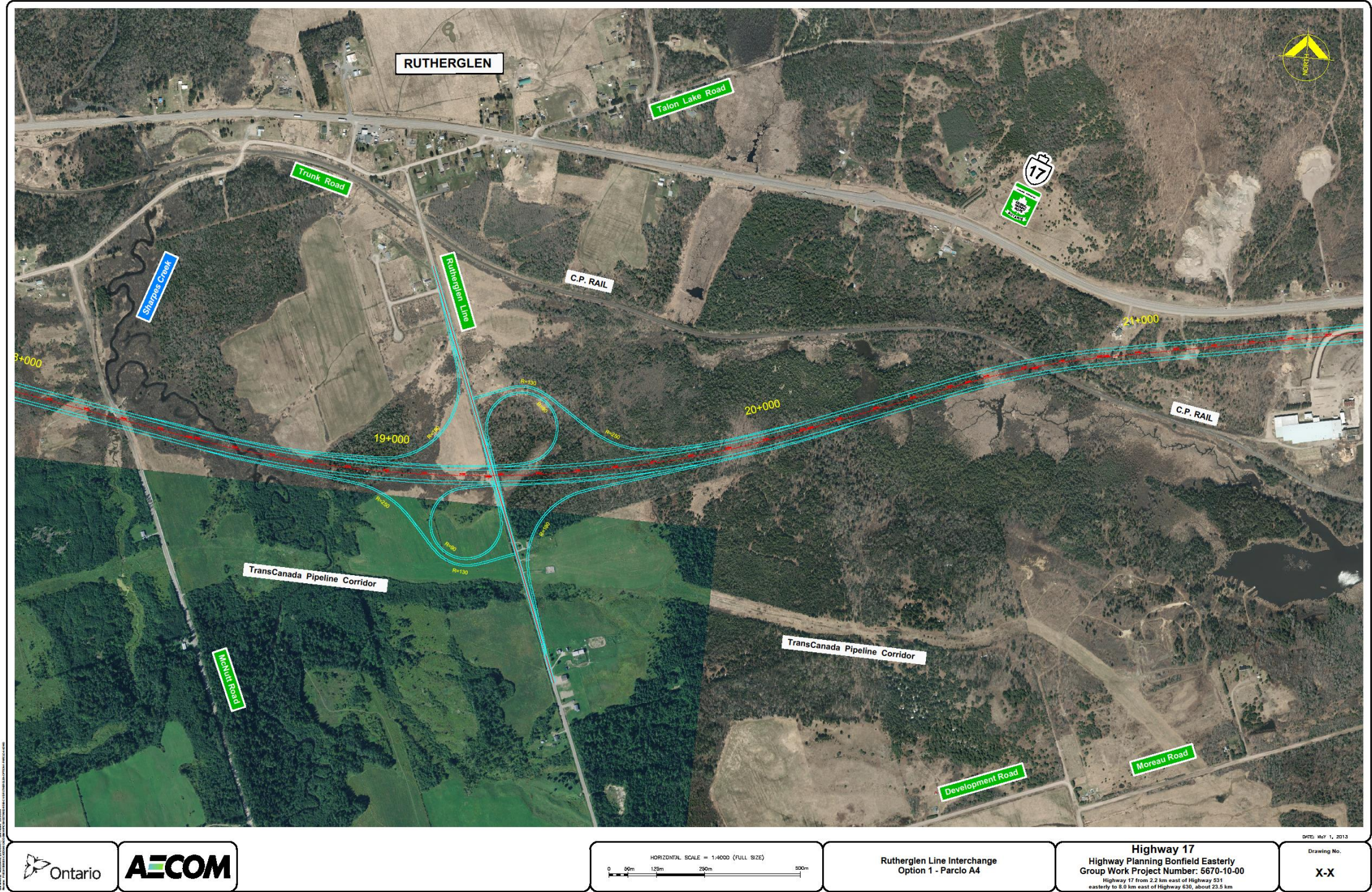




Exhibit 5.19: Rutherglen Line Interchange Alternatives – Alternative 2

Alternative 2  
Diamond Configuration  
(protects for inner loop ramps)

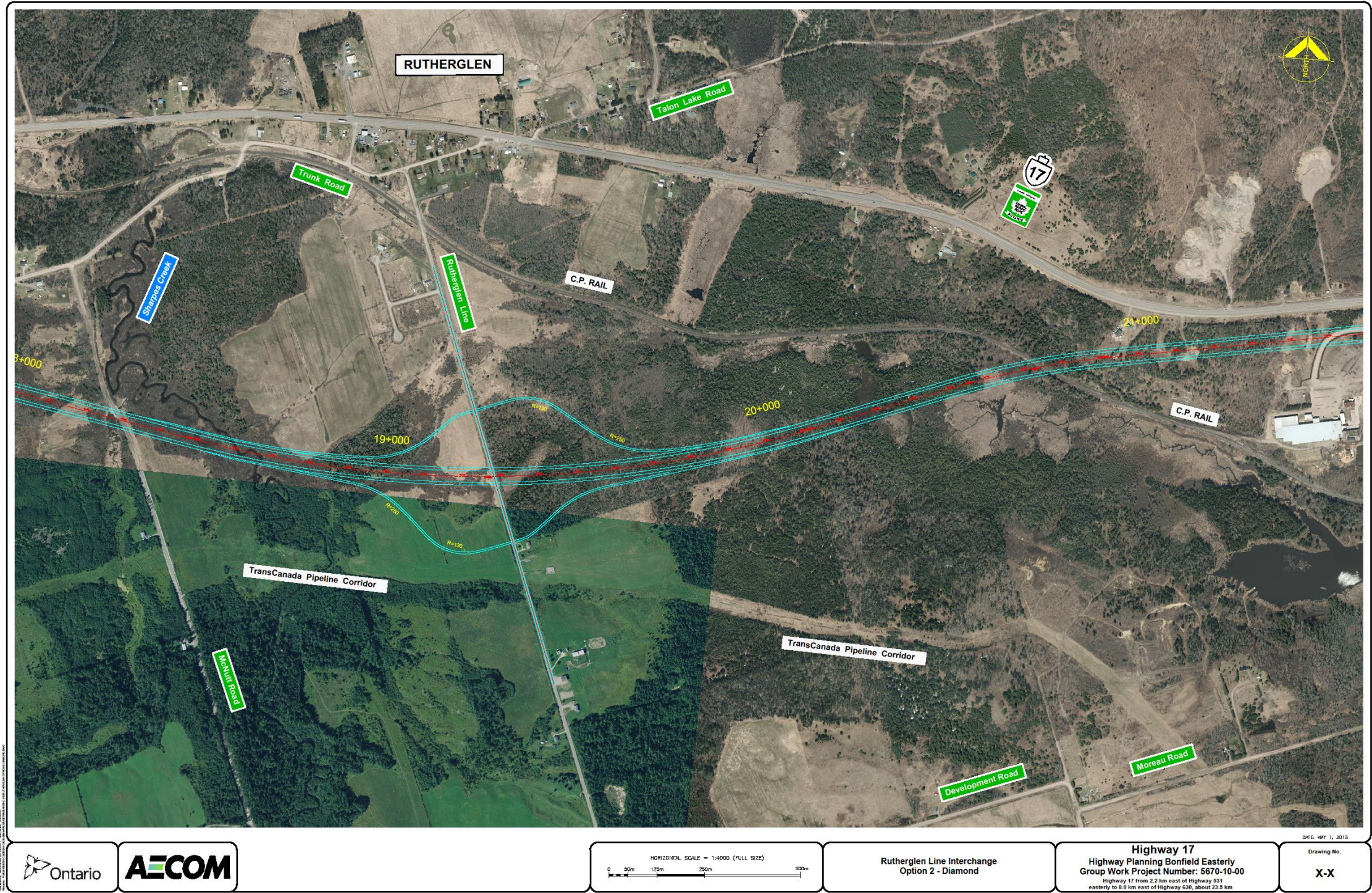




Exhibit 5.20: Rutherglen Line Interchange Alternatives – Alternative 3

Recommended Alternative  
Alternative 3  
Diamond Configuration  
(precludes inner loop ramps)

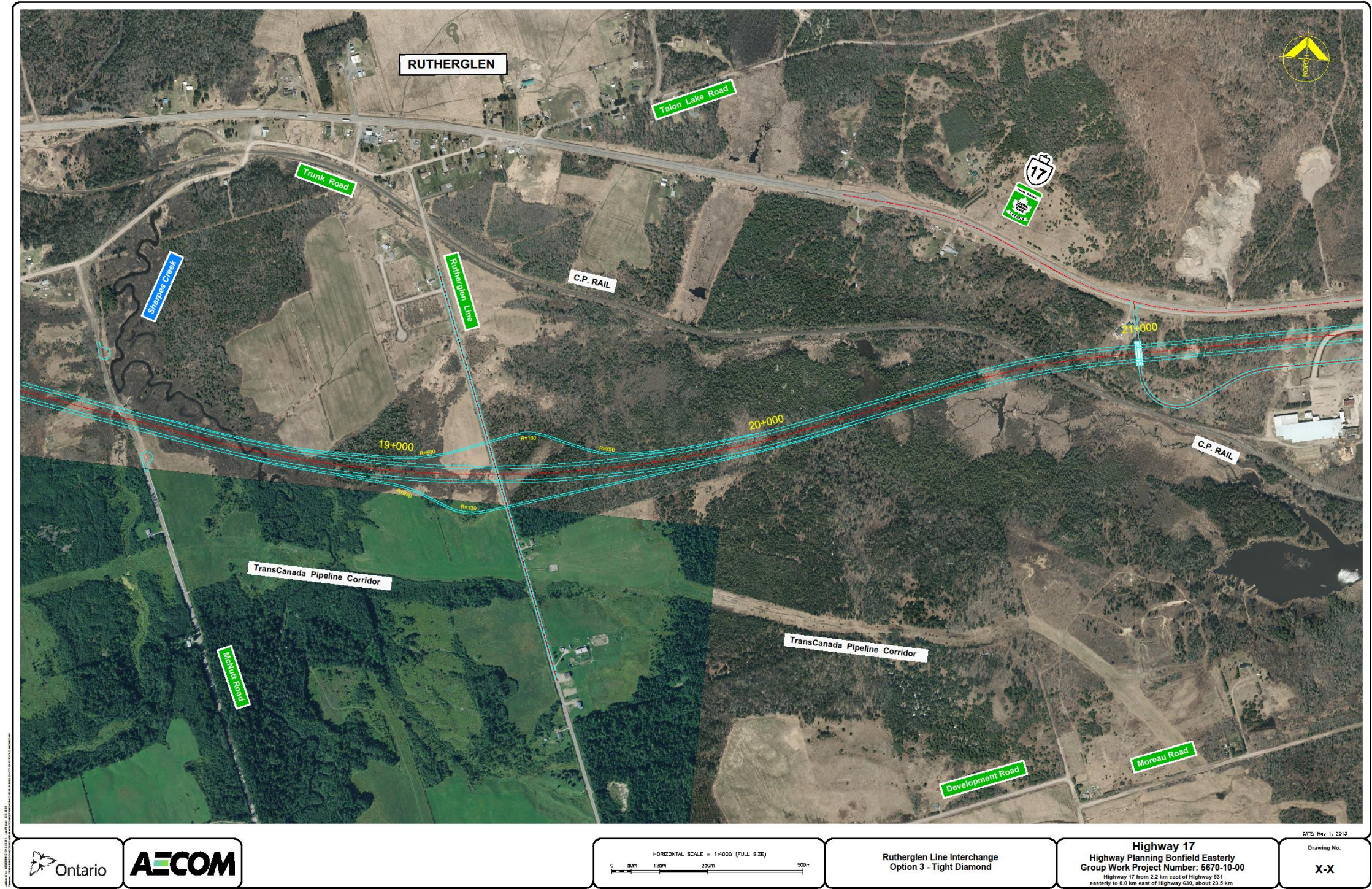




Exhibit 5.21: Evaluation of Rutherglen Line Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Parclo A4 Configuration	Alternative 2 Diamond Configuration (protects for inner loop ramps)	Alternative 3 (Preferred) Diamond Configuration (precludes inner loop ramps)
Natural Environment				
Fish and fish habitat	1. Number of watercourses / waterbodies crossed	▪ 2 crossings of tributaries to Sparks/Sharpes Creek	▪ 2 crossings of a tributaries to Sparks/Sharpes Creek	▪ 2 crossings of tributaries to Sparks/Sharpes Creek
	2. Number of watercourses / waterbodies crossed with fish habitat / Species at Risk (SAR)	▪ 0 ▪ No known spawning areas in close proximity	▪ 0 ▪ No known spawning areas in close proximity	▪ 0 ▪ No known spawning areas in close proximity
Designated Areas	3. Amount (ha) of significant vegetation displaced (Significant Valleylands, ESAs, ANSIs, or other areas of provincial, regional or local significance)	▪ 0 ha	▪ 0 ha	▪ 0 ha
Vegetation	4. Area (ha) of woodland displaced	▪ 15.83 ha	▪ 15.96 ha	▪ 12.70 ha
	5. Number of known vegetative SAR within the ROW	▪ 0	▪ 0	▪ 0
Wetlands	6. Amount (ha) of wetlands displaced <i>(note: all wetlands in the study area are Unevaluated designation)</i>	▪ 7.86 ha	▪ 8.02 ha	▪ 7.49 ha
Wildlife and wildlife habitat	7. Amount (ha) of known significant wildlife habitat areas and travel corridors displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha
	8. Amount (ha) of known habitat for known SAR or of conservation concern displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha
Groundwater	9. Amount (ha) of known groundwater recharge and discharge areas displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha
Water Wells	10. Number of water wells displaced / within 150m	▪ 0 displaced, 5 within 150m	▪ 0 displaced, 5 within 150m	▪ 0 displaced, 1 within 150m
Natural Environment Summary		Alternative 3 is slightly preferred as it results in least impacts to areas of woodland.		
Socio-Economic / Land Use				
Residential	11. Number of residential homes displaced <i>(note: no designated residential lands (as per Official Plan) impacted by any alternative)</i>	▪ 1 home	▪ 1 home	▪ 1 home
Commercial / industrial	12. Number of commercial / industrial buildings displaced <i>(note: no designated commercial / industrial lands (as per Official Plan) impacted by any alternative)</i>	▪ 0	▪ 0	▪ 0
Agriculture	13. Amount (ha) of Canada Land Inventory Class 1, 2 and 3 soils displaced	▪ 24.27 ha	▪ 23.06 ha	▪ 17.62 ha
	14. Number of agricultural buildings displaced	▪ 0	▪ 0	▪ 0
Provincial parks	15. Amount (ha) of provincial parks impacted / displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha
Community/ recreational/ tourist facilities	16. Number of community / recreational facilities / tourist attractions impacted	▪ 0	▪ 0	▪ 0
	17. Number of trail crossings (canoe, snow mobile, pedestrian) impacted	▪ 0	▪ 0	▪ 0
Contaminated properties/ waste management	18. Number of operating and "non-operating" waste disposal sites impacted	▪ 0	▪ 0	▪ 0
Highway noise	19. Number of noise sensitive areas within 600 m of the ROW	▪ 36	▪ 36	▪ 35
Air quality	20. Number of sensitive receptors within 600 m of the ROW	▪ 36	▪ 36	▪ 35
Aggregates and mineral resources	21. Amount (ha) of mineral and mineral aggregate resources impacted / displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha



Exhibit 5.21: Evaluation of Rutherglen Line Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Parclo A4 Configuration	Alternative 2 Diamond Configuration (protects for inner loop ramps)	Alternative 3 (Preferred) Diamond Configuration (precludes inner loop ramps)
Socio-Economic/ Land Use Summary		Alternative 3 is slightly preferred as it results in least impacts to lands with CLI 1, 2 or 3.		
Cultural Environment				
Built heritage and cultural landscapes	22. Number of designated / locally significant built heritage features / cultural heritage landscapes impacted	▪ 0	▪ 0	▪ 0
Archaeology	23. Amount (ha) of land with archaeological potential affected	▪ 37.39 ha	▪ 35.72 ha	▪ 27.61 ha
Cultural Environment Summary		Alternative 3 is slightly preferred as it results in least impacts to lands with archaeological potential.		
Transportation				
Accommodation of long term planning objectives	24. Potential to accommodate long term planning objectives and support the efficient movement of people and goods between communities and regions	▪ High	▪ High	▪ High
Accommodation of projected traffic demand	25. Potential to address the transportation problems and opportunities	▪ High	▪ High	▪ High
Enhancement of safety	26. Potential to improve safety	▪ High	▪ High	▪ High
Traffic operations on municipal roads and intersections	27. Number of crossings of local / municipal roads	▪ 2	▪ 2	▪ 2
	28. Number of private accesses impacted	▪ 3	▪ 1	▪ 1
Design consistency with geometric standards for Ontario	29. Consistency with geometric design standards	▪ High	▪ High	▪ High
Travel time/ out of way travel	30. Potential for increased travel time / out of way travel	▪ Low	▪ Low	▪ Low
Transportation Summary		Alternatives are equally preferred.		
Cost				
Construction cost (considering utility relocation, amount of property required, rail crossings, etc)	31. Dollars	▪ \$10.0 million	▪ \$6.7 million	▪ \$6.1 million
Cost Summary		Alternative 3 is slightly preferred as it is the least costly. Further, it does not impact the utility sites situated on the east side of Rutherglen Line.		
Constructability				
Existing traffic flow and operations accommodated during construction	32. Complexity of staging and traffic flow maintenance during construction	▪ Low complexity	▪ Low complexity	▪ Low complexity
Availability of staged construction				
Constructability Summary		Alternatives are equally preferred.		

Exhibit 5.21: Evaluation of Rutherglen Line Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Parclo A4 Configuration	Alternative 2 Diamond Configuration (protects for inner loop ramps)	Alternative 3 (Preferred) Diamond Configuration (precludes inner loop ramps)
Overall Summary and Recommendation		Alternative 3 was recommended as it: <ul style="list-style-type: none"><li>Results in least impacts to the socio-economic environment (CLI Class 1, 2 or 3 soils).</li><li>Results in least impacts to the cultural environment (area of archaeological potential).</li><li>Has a lower construction cost.</li><li>Is equally preferred relative to other alternatives from a transportation and constructability perspective.</li></ul>		



**Highway 630 Interchange Configuration**

Five alternative interchange configurations were generated for the Highway 630 location as shown in **Exhibits 5.22 to 5.26**.

On the basis of the assessment and evaluation results presented in **Exhibit 5.27, Alternative 2**, with a diamond on the north side and a Parclo A2 configuration on the south side, is recommended as it:

- Is equally or more preferred relative to other alternatives from a Natural Environment, Socio-Economic Environment, Cultural Environment, Transportation and Constructability perspective; and
- Has a lower construction cost.

**Exhibit 5.22: Highway 630 Interchange Alternatives – Alternative 1**

**Alternative 1  
Diamond Configuration**





Exhibit 5.23: Highway 630 Interchange Alternatives – Alternative 2

Recommended Alternative  
  
Alternative 2  
North side Diamond  
South side Parclo A2 Configuration





Exhibit 5.24: Highway 630 Interchange Alternatives – Alternative 3

Alternative 3  
North side Diamond Roundabout  
South side Parclo A2 Configuration





Exhibit 5.25: Highway 630 Interchange Alternatives – Alternative 4

Alternative 4  
Diamond  
Roundabout Configuration

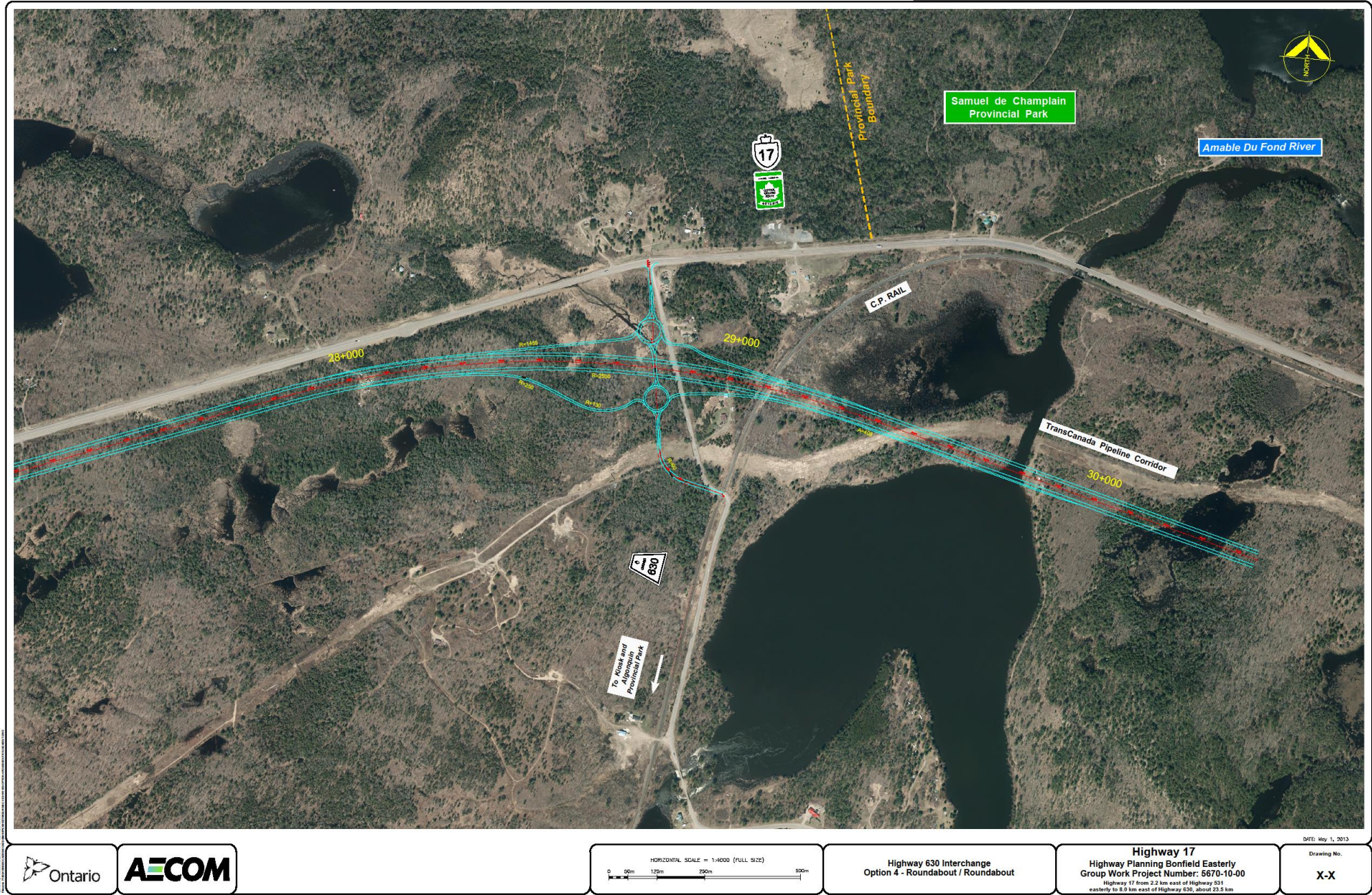




Exhibit 5.26: Highway 630 Interchange Alternatives – Alternative 5

Alternative 5  
North side Buttonhook  
South side Parclo A2 Configuration

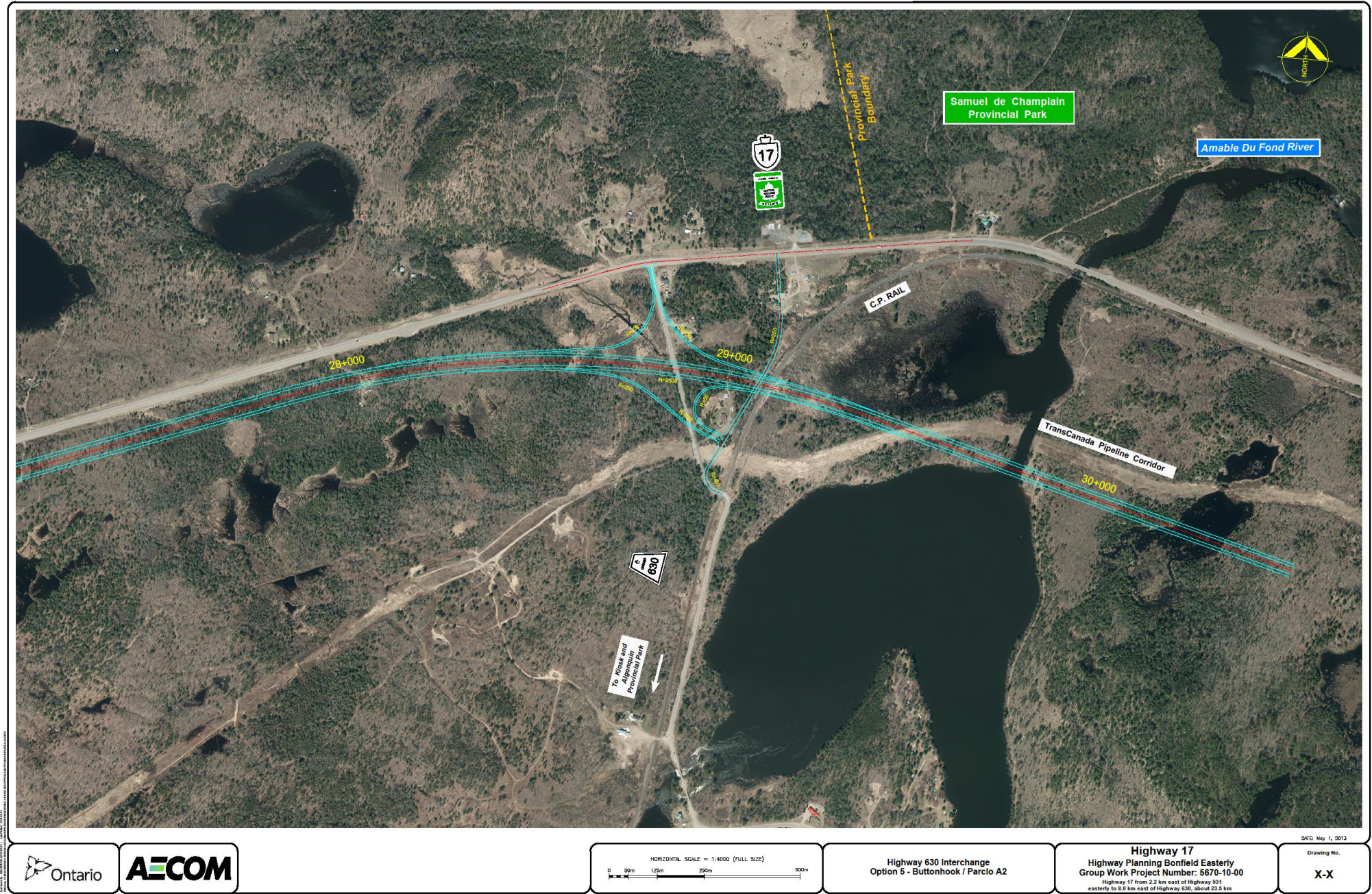




Exhibit 5.27: Evaluation of Highway 630 Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Diamond Configuration	Alternative 2 (Preferred) North side Diamond South side Parclo A2 Configuration	Alternative 3 North side Diamond Roundabout South side Parclo A2 Configuration	Alternative 4 Diamond Roundabout Configuration	Alternative 5 North side Buttonhook South side Parclo A2 Configuration
Natural Environment						
Fish and fish habitat	1. Number of watercourses / waterbodies crossed	<ul style="list-style-type: none"><li>4 crossings<ul style="list-style-type: none"><li>2 Unnamed Watercourses</li><li>1 Amable du Fond River River</li><li>1 Crooked Chute Lake</li></ul></li></ul>	<ul style="list-style-type: none"><li>2 crossings<ul style="list-style-type: none"><li>2 Unnamed Watercourses</li></ul></li></ul>	<ul style="list-style-type: none"><li>2 crossings<ul style="list-style-type: none"><li>2 Unnamed Watercourses</li></ul></li></ul>	<ul style="list-style-type: none"><li>2 crossings<ul style="list-style-type: none"><li>2 Unnamed Watercourses</li></ul></li></ul>	<ul style="list-style-type: none"><li>2 crossings<ul style="list-style-type: none"><li>2 Unnamed Watercourses</li></ul></li></ul>
	2. Number of watercourses / waterbodies crossed with fish habitat / Species at Risk (SAR)	<ul style="list-style-type: none"><li>1<ul style="list-style-type: none"><li>No known spawning areas in close proximity</li></ul></li></ul>	<ul style="list-style-type: none"><li>0<ul style="list-style-type: none"><li>No known spawning areas in close proximity</li></ul></li></ul>	<ul style="list-style-type: none"><li>0<ul style="list-style-type: none"><li>No known spawning areas in close proximity</li></ul></li></ul>	<ul style="list-style-type: none"><li>0<ul style="list-style-type: none"><li>No known spawning areas in close proximity</li></ul></li></ul>	<ul style="list-style-type: none"><li>0<ul style="list-style-type: none"><li>No known spawning areas in close proximity</li></ul></li></ul>
Designated Areas	3. Amount (ha) of significant vegetation displaced (Significant Valleylands, ESAs, ANSIs, or other areas of provincial, regional or local significance)	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Vegetation	4. Area (ha) of woodland displaced	<ul style="list-style-type: none"><li>18.56 ha</li></ul>	<ul style="list-style-type: none"><li>17.59 ha</li></ul>	<ul style="list-style-type: none"><li>17.97ha</li></ul>	<ul style="list-style-type: none"><li>17.90 ha</li></ul>	<ul style="list-style-type: none"><li>13.97 ha</li></ul>
	5. Number of known vegetative SAR within the ROW	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>
Wetlands	6. Amount (ha) of wetlands displaced <i>(note: all wetlands in the study area are Unevaluated designation)</i>	<ul style="list-style-type: none"><li>2.62 ha</li></ul>	<ul style="list-style-type: none"><li>2.48 ha</li></ul>	<ul style="list-style-type: none"><li>2.73 ha</li></ul>	<ul style="list-style-type: none"><li>2.75 ha</li></ul>	<ul style="list-style-type: none"><li>2.49 ha</li></ul>
Wildlife and wildlife habitat	7. Amount (ha) of known significant wildlife habitat areas and travel corridors displaced	<ul style="list-style-type: none"><li>24.22 ha (deer yard)</li></ul>	<ul style="list-style-type: none"><li>20.94 ha (deer yard)</li></ul>	<ul style="list-style-type: none"><li>21.51 ha (deer yard)</li></ul>	<ul style="list-style-type: none"><li>21.76 ha (deer yard)</li></ul>	<ul style="list-style-type: none"><li>20.93 ha (deer yard)</li></ul>
	8. Amount (ha) of known habitat for known SAR or of conservation concern displaced	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Groundwater	9. Amount (ha) of known groundwater recharge and discharge areas displaced	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Water Wells	10. Number of water wells displaced / within 150m	<ul style="list-style-type: none"><li>1 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>1 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>1 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>1 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>1 displaced, 3 within 150m</li></ul>
Natural Environment Summary		Alternatives are generally equally preferred, though Alternative 1 is least preferred as it impacts more watercourses.				
Socio-Economic / Land Use						
Residential	11. Number of residential homes displaced <i>(note: no designated residential lands (as per Official Plan) impacted by any alternative)</i>	<ul style="list-style-type: none"><li>1 home, 1 secondary structure</li></ul>	<ul style="list-style-type: none"><li>1 home, 1 secondary structure</li></ul>	<ul style="list-style-type: none"><li>1 home, 1 secondary structure</li></ul>	<ul style="list-style-type: none"><li>1 home, 1 secondary structure</li></ul>	<ul style="list-style-type: none"><li>2 homes, 1 secondary structure</li></ul>
Commercial / industrial	12. Number of commercial / industrial buildings displaced <i>(note: no designated commercial / industrial lands (as per Official Plan) impacted by any alternative)</i>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>
Agriculture	13. Amount (ha) of Canada Land Inventory Class 1, 2 and 3 soils displaced	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
	14. Number of agricultural buildings displaced	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>



Exhibit 5.27: Evaluation of Highway 630 Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Diamond Configuration	Alternative 2 (Preferred) North side Diamond South side Parclo A2 Configuration	Alternative 3 North side Diamond Roundabout South side Parclo A2 Configuration	Alternative 4 Diamond Roundabout Configuration	Alternative 5 North side Buttonhook South side Parclo A2 Configuration
Provincial parks	15. Amount (ha) of provincial parks impacted / displaced	▪ 0.65 ha	▪ 0 ha	▪ 0 ha	▪ 0 ha	▪ 0 ha
Community / recreational / tourist facilities	16. Number of community / recreational facilities / tourist attractions impacted	▪ 0	▪ 0	▪ 0	▪ 0	▪ 0
	17. Number of trail crossings (canoe, snow mobile, pedestrian) impacted	▪ 2 ▪ 1 Canoe ▪ 1 Snowmobile	▪ 1 ▪ 1 Snowmobile	▪ 1 ▪ 1 Snowmobile	▪ 1 ▪ 1 Snowmobile	▪ 1 ▪ 1 Snowmobile
Contaminated properties / waste management	18. Number of operating and "non-operating" waste disposal sites impacted	▪ 0	▪ 0	▪ 0	▪ 0	▪ 0
Highway noise	19. Number of noise sensitive areas within 600 m of the ROW	▪ 13	▪ 13	▪ 13	▪ 13	▪ 12
Air quality	20. Number of sensitive receptors within 600 m of the ROW	▪ 13	▪ 13	▪ 13	▪ 13	▪ 12
Aggregates and mineral resources	21. Amount (ha) of mineral and mineral aggregate resources impacted / displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha	▪ 0 ha	▪ 0 ha
Socio-Economic / Land Use Summary		Alternatives are generally equally preferred, though Alternative 1 is slightly less preferred as it impacts one more trail.				
Cultural Environment						
Built heritage and cultural landscapes	22. Number of designated / locally significant built heritage features / cultural heritage landscapes impacted	▪ 0	▪ 0	▪ 0	▪ 0	▪ 0
Archaeology	23. Amount (ha) of land with archaeological potential affected	▪ 24.22 ha	▪ 20.94 ha	▪ 21.51 ha	▪ 21.46 ha	▪ 20.93 ha
Cultural Environment Summary		Alternatives are generally equally preferred, though Alternative 1 is least preferred as it impacts the greatest area of land with archaeological potential.				
Transportation						
Accommodation of long term planning objectives	24. Potential to accommodate long term planning objectives and support the efficient movement of people and goods between communities and regions	▪ High	▪ High	▪ High	▪ High	▪ High
Accommodation of projected traffic demand	25. Potential to address the transportation problems and opportunities	▪ High	▪ High	▪ High	▪ High	▪ High
Enhancement of safety	26. Potential to improve safety	▪ High	▪ High	▪ High	▪ High	▪ High
Traffic operations on municipal roads and intersections	27. Number of crossings of local / municipal roads	▪ 0	▪ 0	▪ 0	▪ 0	▪ 0
	28. Number of private accesses impacted	▪ 3	▪ 3	▪ 3	▪ 3	▪ 3
Design consistency with geometric standards for Ontario	29. Consistency with geometric design standards	▪ High	▪ Medium ▪ 220m separation from ramp terminal to existing Highway 17 meets minimum separation requirements	▪ High	▪ High	▪ High
Travel time / out of way travel	30. Potential for increased travel time / out of way travel	▪ Low	▪ Low	▪ Low	▪ Low	▪ Low



Exhibit 5.27: Evaluation of Highway 630 Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Diamond Configuration	Alternative 2 (Preferred) North side Diamond South side Parclo A2 Configuration	Alternative 3 North side Diamond Roundabout South side Parclo A2 Configuration	Alternative 4 Diamond Roundabout Configuration	Alternative 5 North side Buttonhook South side Parclo A2 Configuration
Transportation Summary		Alternatives are generally equally preferred however Alternative 2 is slightly less preferred due to minimum separation between ramp terminal and existing Highway 17 intersection.				
Cost						
Construction cost (considering utility relocation, amount of property required, rail crossings, etc)	31. Dollars	▪ \$8.2 million	▪ \$7.9 million	▪ \$8.2 million	▪ \$8.4 million	▪ \$10.3 million
Cost Summary		Alternative 2 is slightly preferred.				
Constructability						
Existing traffic flow and operations accommodated during construction	32. Complexity of staging and traffic flow maintenance during construction	▪ Low complexity	▪ Low complexity	▪ Low complexity	▪ Low complexity	▪ Low complexity
Availability of staged construction						
Constructability Summary		Alternatives are equally preferred.				
Overall Summary and Recommendation		Alternative 2 was recommended as it: <ul style="list-style-type: none"><li>Has the lowest construction cost.</li><li>Is equally or more preferred relative to other alternatives from a natural environment (watercourse crossings), socio-economic environment (trail crossings), cultural environment (area of archaeological potential), transportation and constructability perspective.</li></ul>				



**Boundary Road Interchange Configuration**

Three alternative interchange configurations were generated for the Boundary Road location as shown in **Exhibits 5.28 to 5.30** below.

On the basis of the assessment and evaluation results presented in **Exhibit 5.31, Alternative 2**, the diamond – roundabout configuration, is recommended as it:

- Results in least impacts to Socio-Economic Environment (residential homes displaced);
- Has a lower construction cost; and
- Is equally or more preferred relative to other alternatives from a Natural Environment, Cultural Environment, Transportation and Constructability perspective.

**Exhibit 5.28: Boundary Road Interchange Alternatives – Alternative 1**

**Alternative 1**  
**Parclo A4 Configuration**

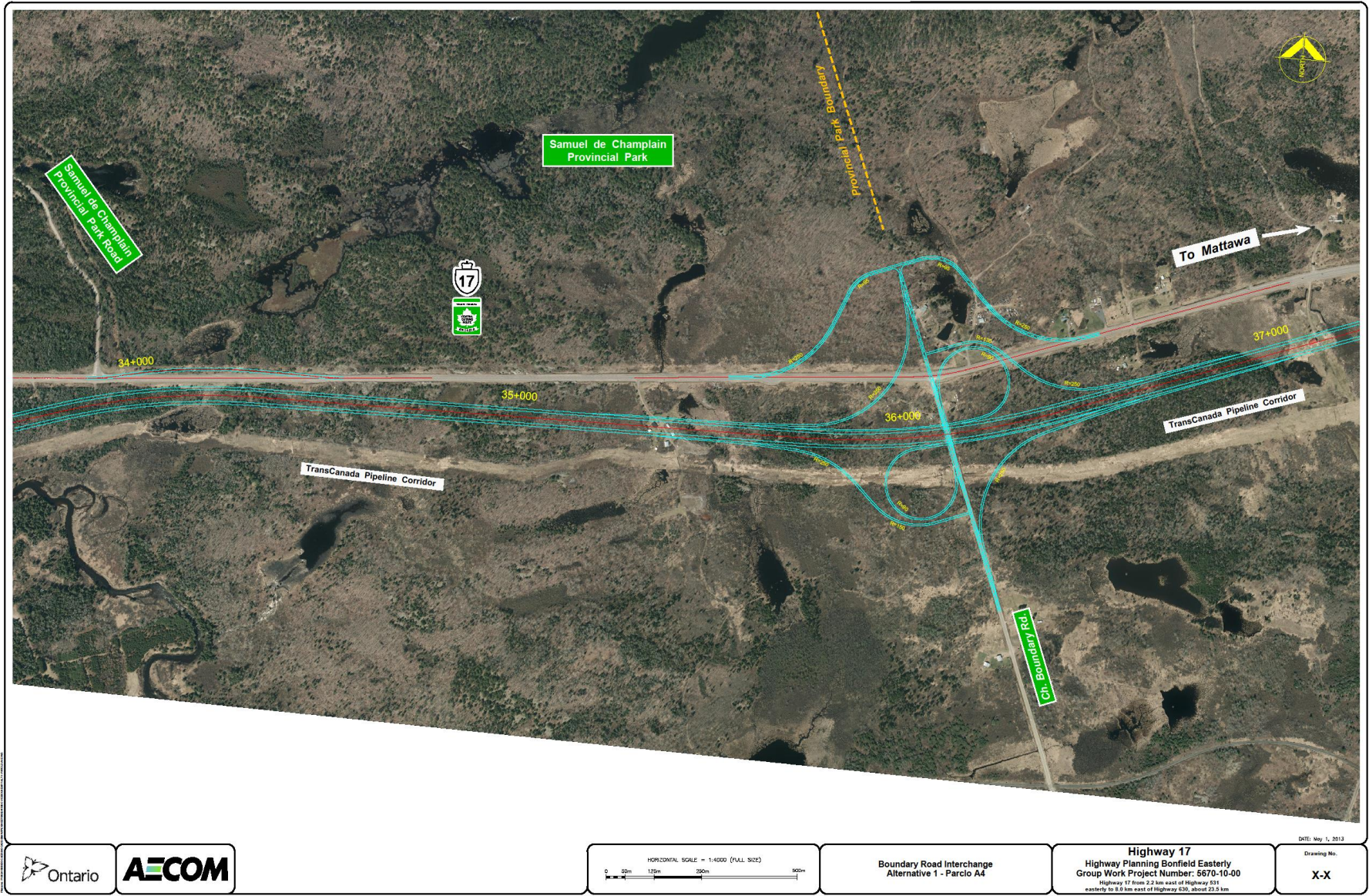




Exhibit 5.29: Boundary Road Interchange Alternatives – Alternative 2

Recommended Alternative  
Alternative 2  
Diamond – Roundabout Configuration

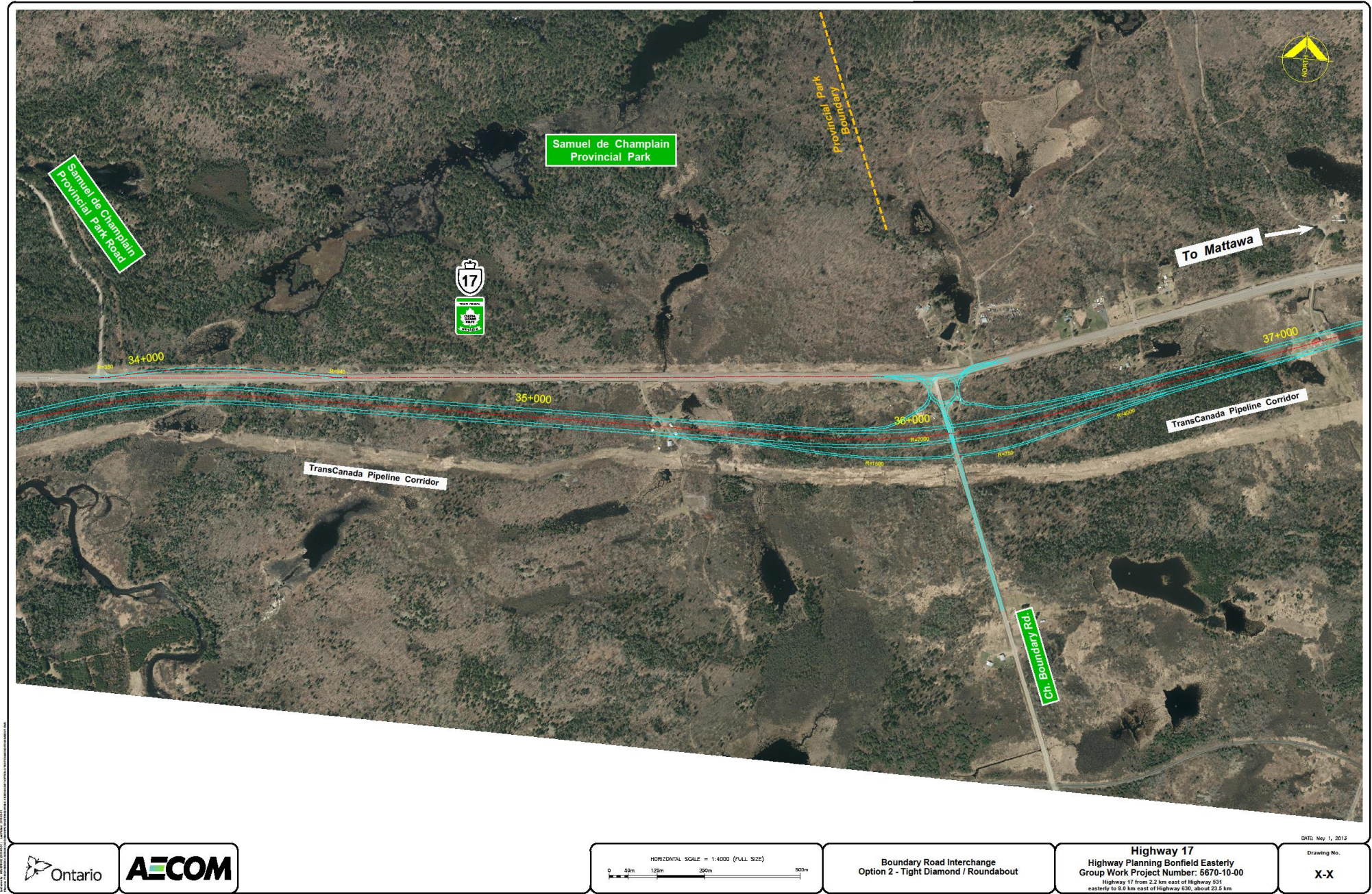




Exhibit 5.30: Boundary Road Interchange Alternatives – Alternative 3

Alternative 3  
Diamond – Buttonhook Configuration





Exhibit 5.31: Evaluation of Boundary Road Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Parclo A4 Configuration	Alternative 2 (Preferred) Diamond Roundabout Configuration	Alternative 3 Diamond Buttonhook Configuration
Natural Environment				
Fish and fish habitat	1. Number of watercourses / waterbodies crossed	<ul style="list-style-type: none"><li>7 crossings of unnamed watercourses / waterbodies crossed / impacted (1 watercourse runs parallel to interchange)</li></ul>	<ul style="list-style-type: none"><li>4 crossings of unnamed watercourses/waterbodies</li></ul>	<ul style="list-style-type: none"><li>4 crossings of unnamed watercourses/waterbodies</li></ul>
	2. Number of watercourses / waterbodies crossed with fish habitat / Species at Risk (SAR)	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>
Designated Areas	3. Amount (ha) of significant vegetation displaced (Significant Valleylands, ESAs, ANSIs, or other areas of provincial, regional or local significance)	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Vegetation	4. Area (ha) of woodland displaced	<ul style="list-style-type: none"><li>31.79 ha</li></ul>	<ul style="list-style-type: none"><li>17.63 ha</li></ul>	<ul style="list-style-type: none"><li>17.59 ha</li></ul>
	5. Number of known vegetative SAR within the ROW	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>
Wetlands	6. Amount (ha) of wetlands displaced <i>(note: all wetlands in the study area are Unevaluated designation)</i>	<ul style="list-style-type: none"><li>7.36 ha</li></ul>	<ul style="list-style-type: none"><li>1.53 ha</li></ul>	<ul style="list-style-type: none"><li>1.56 ha</li></ul>
Wildlife and wildlife habitat	7. Amount (ha) of known significant wildlife habitat areas and travel corridors displaced	<ul style="list-style-type: none"><li>12.24 ha (deer yard)</li></ul>	<ul style="list-style-type: none"><li>2.45 ha (Deer Yard)</li></ul>	<ul style="list-style-type: none"><li>2.41 ha (deer yard)</li></ul>
	8. Amount (ha) of known habitat for known SAR or of conservation concern displaced	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Groundwater	9. Amount (ha) of known groundwater recharge and discharge areas displaced	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>	<ul style="list-style-type: none"><li>0 ha</li></ul>
Water Wells	10. Number of water wells displaced / within 150m	<ul style="list-style-type: none"><li>1 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>0 displaced, 2 within 150m</li></ul>	<ul style="list-style-type: none"><li>0 displaced, 1 within 150m</li></ul>
Natural Environment Summary		Alternatives 2 and 3 are equally preferred as they result in least impacts to watercourses, woodlands, wetlands and areas of known significant wildlife habitat.		
Socio-Economic/ Land Use				
Residential	11. Number of residential homes displaced <i>(note: no designated residential lands (as per Official Plan) impacted by any alternative)</i>	<ul style="list-style-type: none"><li>5 homes, 4 secondary structures</li></ul>	<ul style="list-style-type: none"><li>2 homes, 1 secondary structure</li></ul>	<ul style="list-style-type: none"><li>1 home</li></ul>
Commercial / industrial	12. Number of commercial / industrial buildings displaced <i>(note: no designated commercial/ industrial lands (as per Official Plan) impacted by any alternative)</i>	<ul style="list-style-type: none"><li>1</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>	<ul style="list-style-type: none"><li>0</li></ul>



Exhibit 5.31: Evaluation of Boundary Road Interchange Alternatives

Factor Criteria	Indicators	Alternative 1 Parclo A4 Configuration	Alternative 2 (Preferred) Diamond Roundabout Configuration	Alternative 3 Diamond Buttonhook Configuration
Agriculture	13. Amount (ha) of Canada Land Inventory Class 1, 2 and 3 soils displaced	▪ 0 ha	▪ 0 ha	▪ 0 ha
	14. Number of agricultural buildings displaced	▪ 2	▪ 3	▪ 3
Provincial parks	15. Amount (ha) of provincial parks impacted/ displaced	▪ 6.76 ha	▪ 0 ha	▪ 0 ha
Community / recreational / tourist facilities	16. Number of community/ recreational facilities/ tourist attractions impacted	▪ 0	▪ 0	▪ 0
	17. Number of trail crossings (canoe, snow mobile, pedestrian) impacted	▪ 1	▪ 0	▪ 0
Contaminated properties / waste management	18. Number of operating and "non-operating" waste disposal sites impacted	▪ 0	▪ 0	▪ 0
Highway noise	19. Number of noise sensitive areas within 600 m of the ROW	▪ 10	▪ 12	▪ 14
Air quality	20. Number of sensitive receptors within 600 m of the ROW	▪ 10	▪ 12	▪ 14
Aggregates and mineral resources	21. Amount (ha) of mineral and mineral aggregate resources impacted / displaced	▪ 0 ha	▪ 1.4 ha	▪ 1.4 ha
Socio-Economic / Land Use Summary		Alternative 3 is preferred as it results in least homes displaced.		
Cultural Environment				
Built heritage and cultural landscapes	22. Number of designated/ locally significant built heritage features / cultural heritage landscapes impacted	▪ 0	▪ 0	▪ 0
Archaeology	23. Amount (ha) of land with archaeological potential affected	▪ 47.88 ha	▪ 24.38 ha	▪ 22.05 ha
Cultural Environment Summary		Alternatives 2 and 3 are preferred as they result in least area of land with archaeological potential displaced.		
Transportation				
Accommodation of long term planning objectives	24. Potential to accommodate long term planning objectives and support the efficient movement of people and goods between communities and regions	▪ High	▪ High	▪ High
Accommodation of projected traffic demand	25. Potential to address the transportation problems and opportunities	▪ High	▪ High	▪ High



Exhibit 5.31: Evaluation of Boundary Road Interchange Alternatives

Factor	Indicators	Alternative 1	Alternative 2 (Preferred)	Alternative 3
Criteria		Parclo A4 Configuration	Diamond Roundabout Configuration	Diamond Buttonhook Configuration
Enhancement of safety	26. Potential to improve safety	▪ High	▪ High	▪ High
Traffic operations on municipal roads and intersections	27. Number of crossings of local / municipal roads	▪ 2	▪ 2	▪ 2
	28. Number of private accesses impacted	▪ 3	▪ 3	▪ 3
Design consistency with geometric standards for Ontario	29. Consistency with geometric design standards	▪ High	▪ High	▪ High
Travel time / out of way travel	30. Potential for increased travel time / out of way travel	▪ Low	▪ Low	▪ Moderate
Transportation Summary		Alternatives 1 and 2 are equally preferred as they result in the least out of way travel.		
Cost				
Construction cost (considering utility relocation, amount of property required, rail crossings, etc)	31. Dollars	▪ \$10.0 million	▪ \$6.5 million	▪ \$6.3 million
Cost Summary		Alternatives 2 and 3 are preferred as they are the least costly.		
Constructability				
Existing traffic flow and operations accommodated during construction	32. Complexity of staging and traffic flow maintenance during construction	▪ Low complexity	▪ Low complexity	▪ Low complexity
Availability of staged construction				
Constructability Summary		Alternatives are equally preferred.		
Overall Summary and Recommendation		Alternative 2 was recommended as it: <ul style="list-style-type: none"><li>Is equally or more preferred relative to other alternatives from a natural environment (watercourses, woodlands, wetlands and areas of known significant wildlife habitat), cultural environment (area of archaeological potential), transportation, constructability and cost perspective.</li><li>Results in comparable impacts to Alternative 3 from a socio-economic environment (residential homes displaced).</li></ul>		

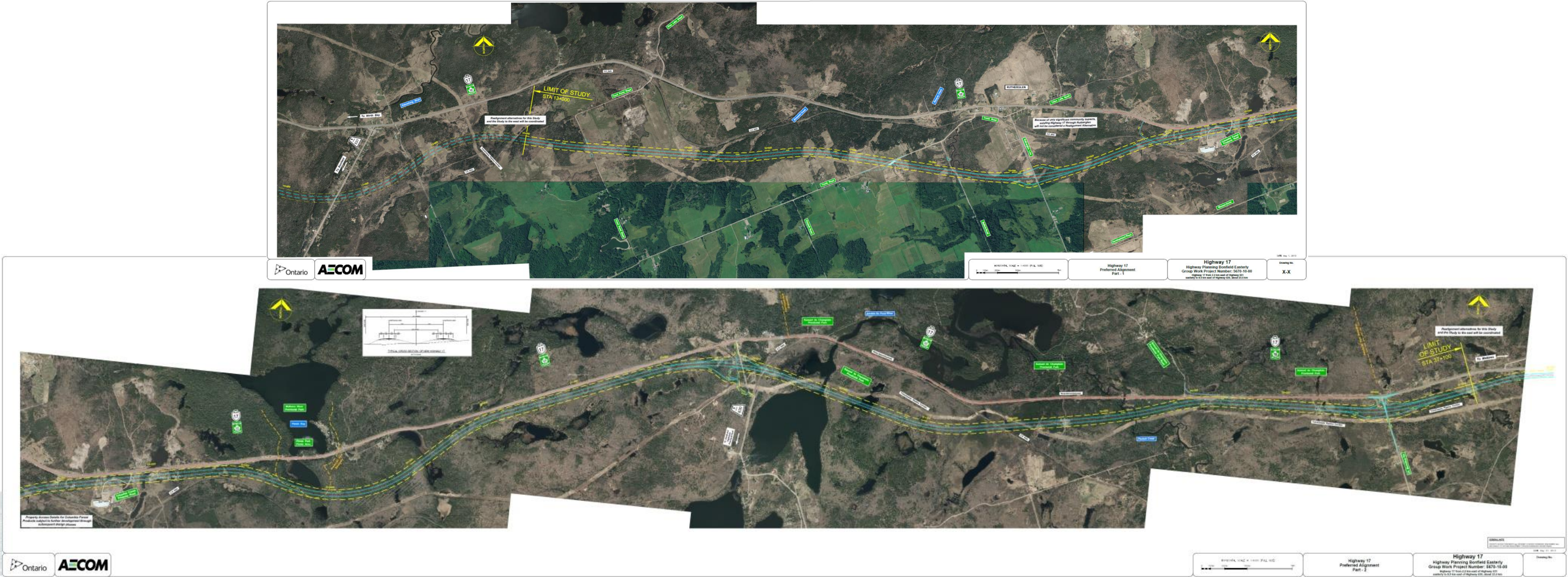


5.2.3 Recommended Highway Planning Alternative

The recommended highway planning alternative as presented at PIC #2 is shown in **Exhibit 5.32** and included:

- Realignment of Highway 17 to the south from Highway 531 to east of Rutherglen
- Widening and realignment of Highway 17 to the south from east of Rutherglen to west of Highway 630
- Realignment of Highway 17 to the south from west of Highway 630 to west of Pautois Creek
- Widening of Highway 17 to the south from west of Pautois Creek to just east of Boundary Road
- Interchanges at Rutherglen Line, Highway 630 and Boundary Road
- Closure of existing Highway 17 from east of Highway 630 to the entrance of Samuel de Champlain Park entrance
- Retention of existing Highway 17 as a service road at all other locations
- Cul-de-sacs at Trout Pond Road and McNutt Road

Exhibit 5.32: Recommended Highway Planning Alternative





5.3 Refinements to the Recommended Highway Planning Alternative

In response to the comments and questions raised through the PIC #2 consultation process, three refinements to the Recommended Highway Planning Alternative were reviewed and incorporated in the Preferred Plan as detailed below.

5.3.1 Trout Pond Road

As part of the Recommended Highway Planning Alternative presented at PIC #2, it was recommended that Trout Pond Road be closed at the new highway with a cul-de-sac provided north and south of the highway corridor. In response to municipal and local stakeholder input, a grade separation was reviewed and was recommended at Trout Pond Road to provide access across the highway in this area as shown below.

Previous Recommendation (PIC # 2)  
Trout Pond Road Cul-de-sac

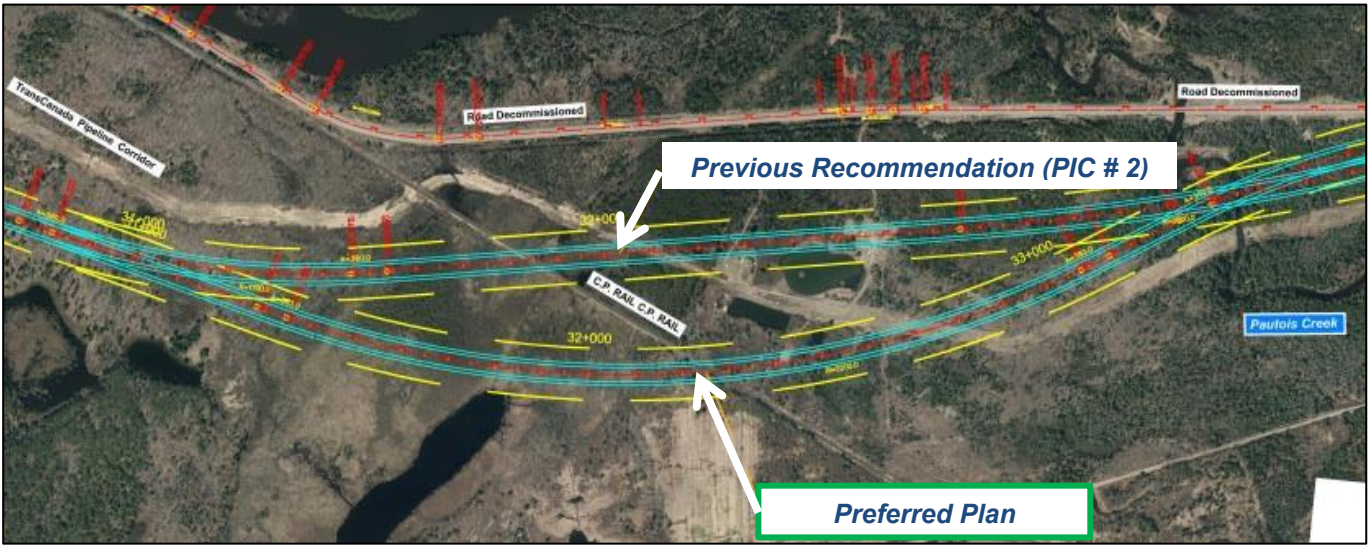


Refinement – Preferred Plan  
Trout Pond Road Grade Separated



5.3.2 Alignment Realignment west of Pautois Creek

The potential for refining the realignment of Highway 17 west of Pautois Creek was reviewed in order to reduce impacts to two residential properties. The refinement relative to the alignment presented at PIC #2 is shown below. The refinement reduces the impacts to the residential properties and was recommended for inclusion as part of the Preferred Plan for Preliminary Design.

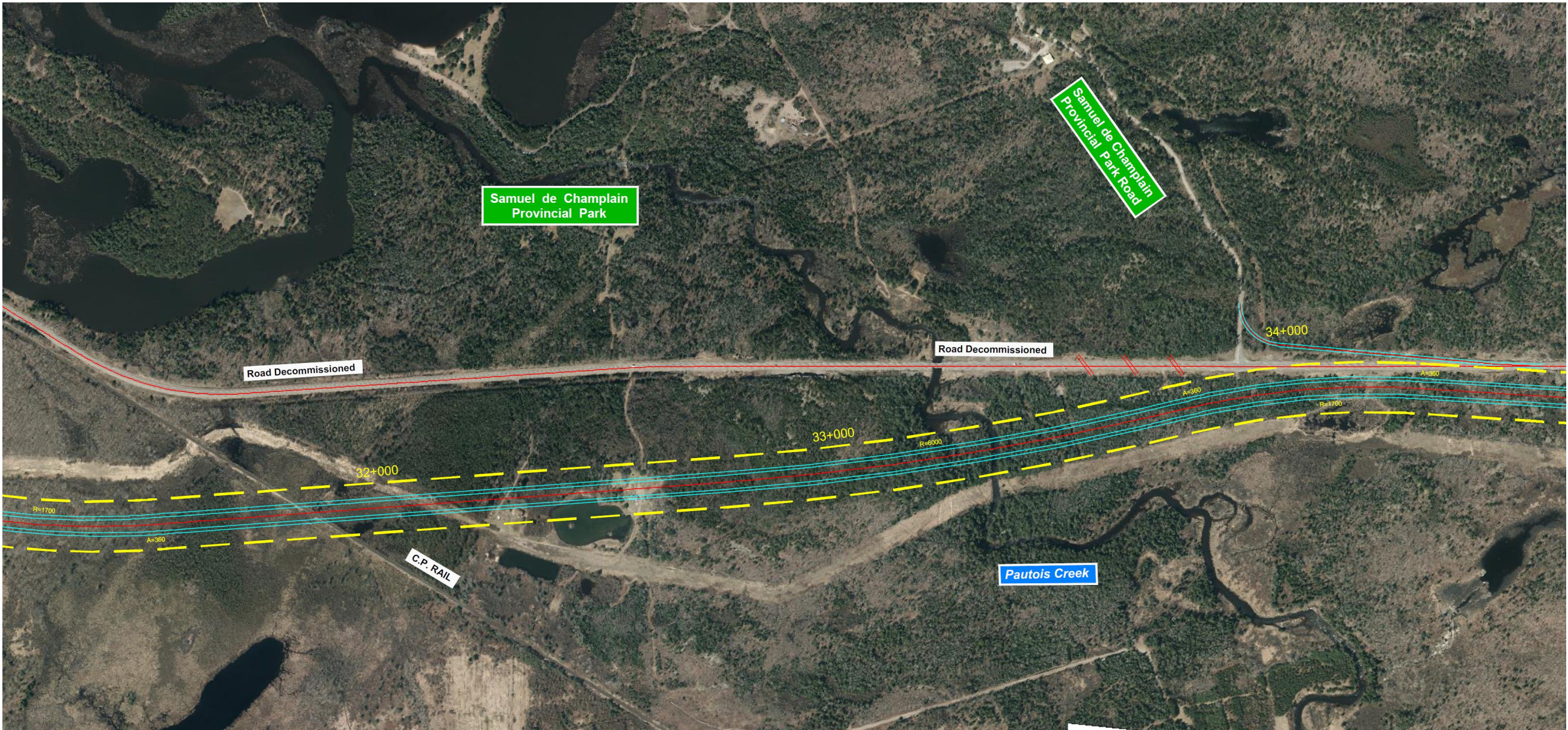




5.3.3 Service Road at Samuel de Champlain Provincial Park / Pautois Creek Crossing

At PIC #2, it was recommended that existing Highway 17 from east of Highway 630 to the Samuel de Champlain Park entrance be decommissioned. In response to stakeholder input and given the proposed realignment of the new Highway 17 corridor west of Pautois Creek (described above), existing Highway 17 will be retained from approximately 1 km west of Pautois Creek to Boundary Road as shown below. The refinement maintains emergency egress from the park and maintains access to the two residential properties west of Pautois Creek.

*Previous Recommendation (PIC # 2)  
Road Decommissioned at Entrance to Samuel de Champlain Park*





*Preferred Plan*  
*Road Decommissioned west of Entrance to Samuel de Champlain Park*

