



Welcome to Public Information Centre #1

**Highway 401 Planning Study from Colborne to Brighton
Preliminary Design and Class Environmental Assessment Study**

GWP 4054-17-00

www.highway401colbornebrighton.ca

April 21, 2021





PROJECT TEAM

Ministry of Transportation

Muhammed Waseem, Senior Project Engineer

Erin Pipe, Environmental Planner

WSP

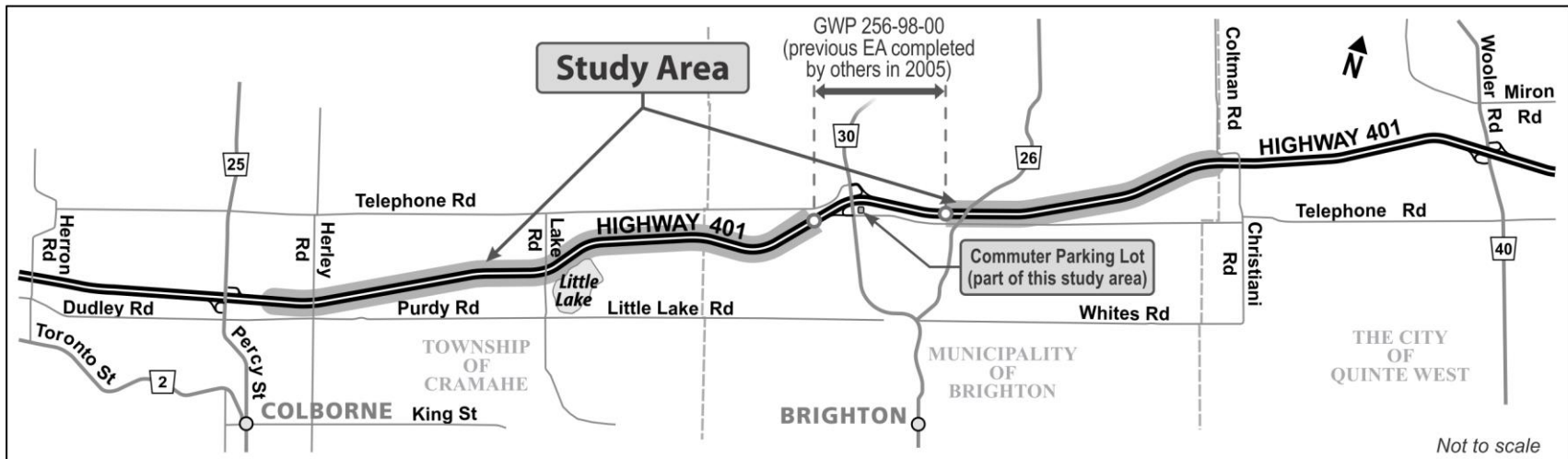
Brent Gotts, Consultant Project Manager

J.A. (Sandy) Nairn, Consultant Environmental Planner

Study Overview

MTO has retained **WSP** to undertake a Planning, Preliminary Design and Class Environmental Assessment (Class EA) Study on Highway 401 improvements, including:

- Rehabilitation / replacement of bridges and structural culverts;
- Establishing the future Highway 401 footprint for the interim six lanes and ultimate eight lanes so that the bridges and culverts can be designed appropriately;
- Commuter parking lot improvements at County Road 30;
- Study limits are from 0.8 km east of Percy Street to 0.4 km west of Christiani Road (excluding the County Road 30 interchange).

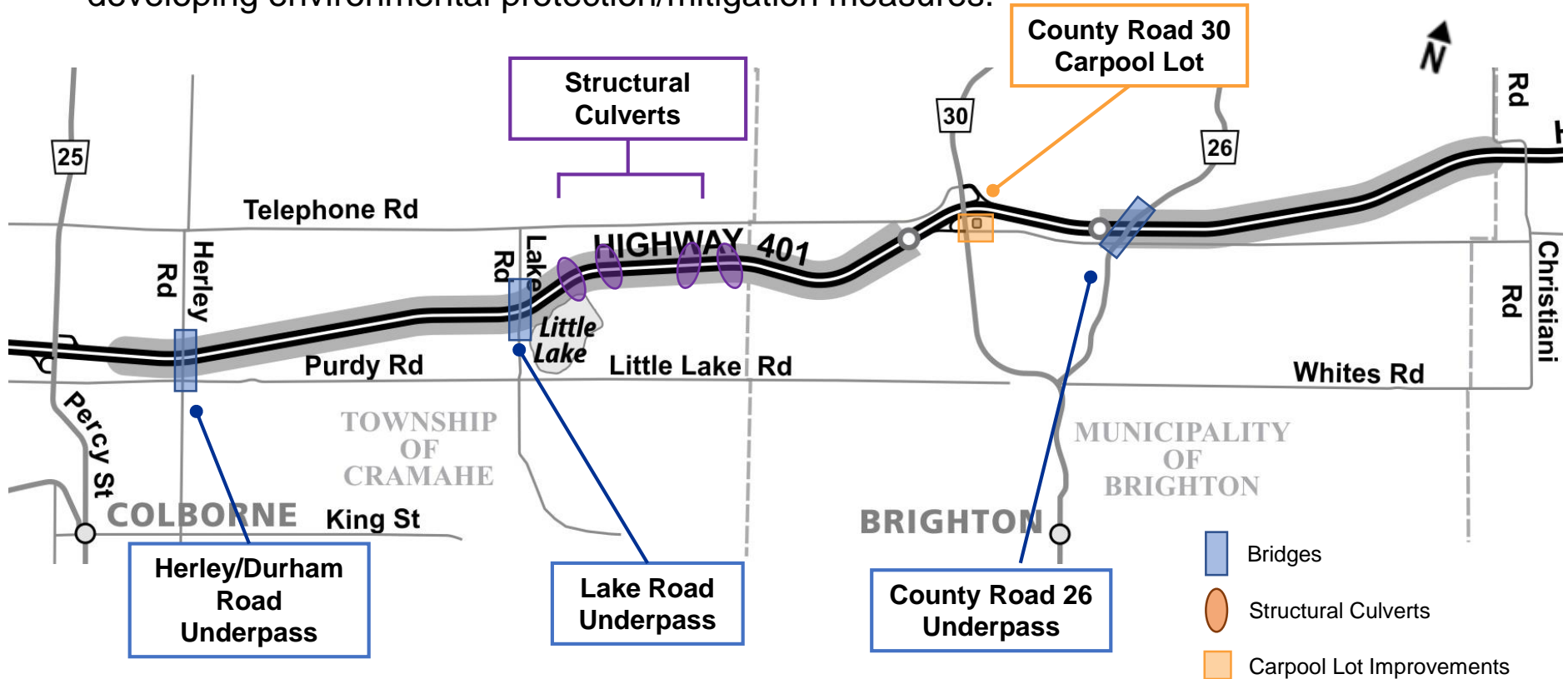


Study Overview

This Planning, Preliminary Design, and Class EA study will include:

- reviewing existing conditions,
- developing and evaluating alternatives of the study area,
- identifying appropriate improvements, and
- developing environmental protection/mitigation measures.

A Preferred Plan will be confirmed and designated (protected) at the completion of the study.

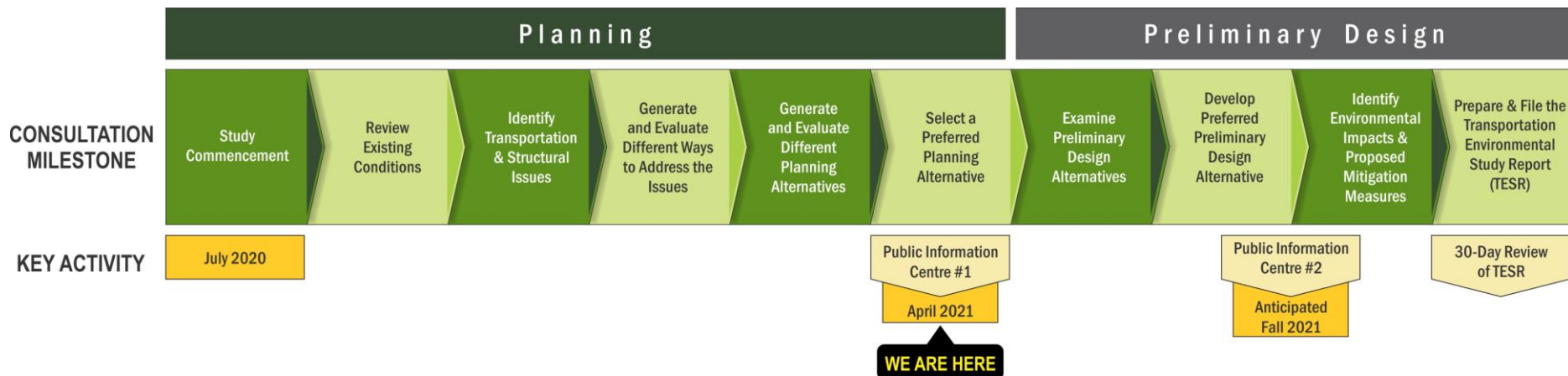


Adjacent Studies

Adjacent	Status
<p>Highway 401 Study – Cobourg to Colborne – Planning, Preliminary Design and Class EA Study (GWP 4060-11-00)</p> <p>This Project includes the replacement and rehabilitation of bridges and culverts, interchange modifications, establishing the future Highway 401 footprint for the interim six lanes and ultimate eight lanes, and commuter parking lot expansions, from 2 km east of Nagle Road to Percy Street (approximately 18 km).</p>	<ul style="list-style-type: none">• Public Information Centre #2 took place in Summer 2020.• The Transportation Environmental Study Report (TESR) will be available for public review later in 2021.
<p>Highway 401 – County Road 30 Interchange – Preliminary Design and Class EA Study (GWP 256-98-00)</p> <p>This Project included improvements to the County Road 30 Interchange.</p>	<ul style="list-style-type: none">• This EA Study was previously completed in 2005

Class Environmental Assessment Process

This Preliminary Design and Class EA Study will follow the approved environmental planning process for Group 'B' projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000).



Consultation & Engagement

Consultation and engagement with external agencies, Indigenous communities, and the public are essential components of the Class EA process. The public is encouraged to provide input at any point during this project.

External agencies that have been consulted, to name a few:

- Ministry of Environment, Conservation and Parks (MECP)
- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)
- Lower Trent Conservation Authority
- Local lower and upper tier municipalities, such as Municipality of Brighton, Township of Cramahe, City of Quinte West and Northumberland County.
- Emergency services, including local fire, police and paramedic services

Indigenous communities that have been engaged with:

- Alderville First Nation
- Beausoleil First Nation
- Georgina Island First Nation
- Chippewas of Rama First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Métis Nation of Ontario
- Mississaugas of Scugog Island First Nation
- Mohawks of the Bay of Quinte
- Williams Treaty First Nations

Consultation & Engagement

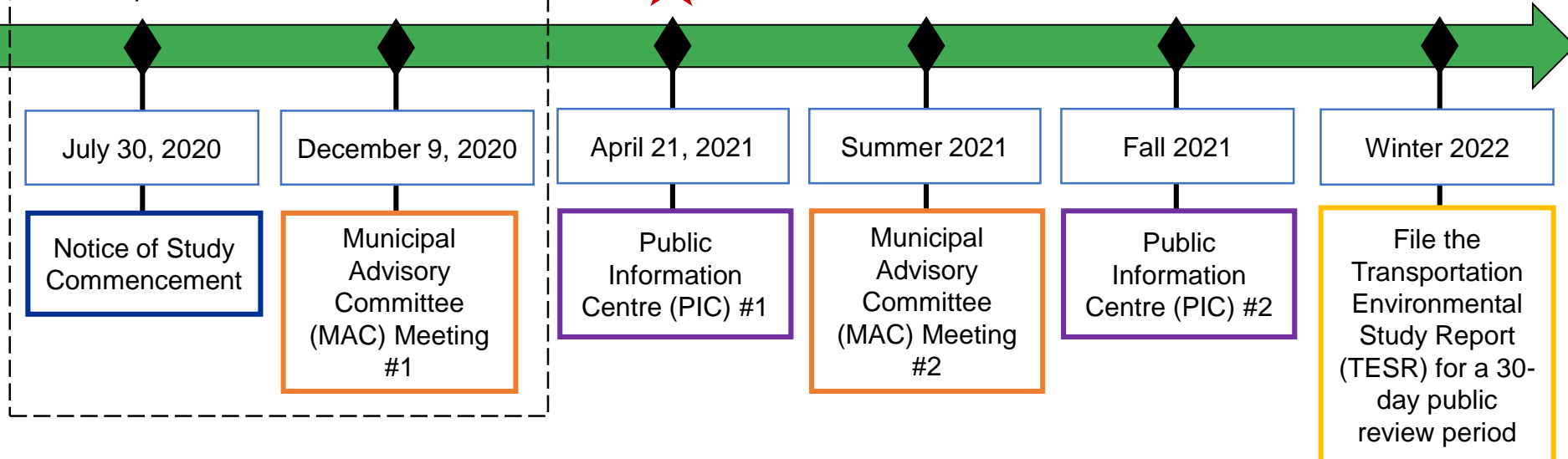


Consultation activities provide a forum to identify potentially significant issues early in the decision-making process and ensures that they are given appropriate consideration.

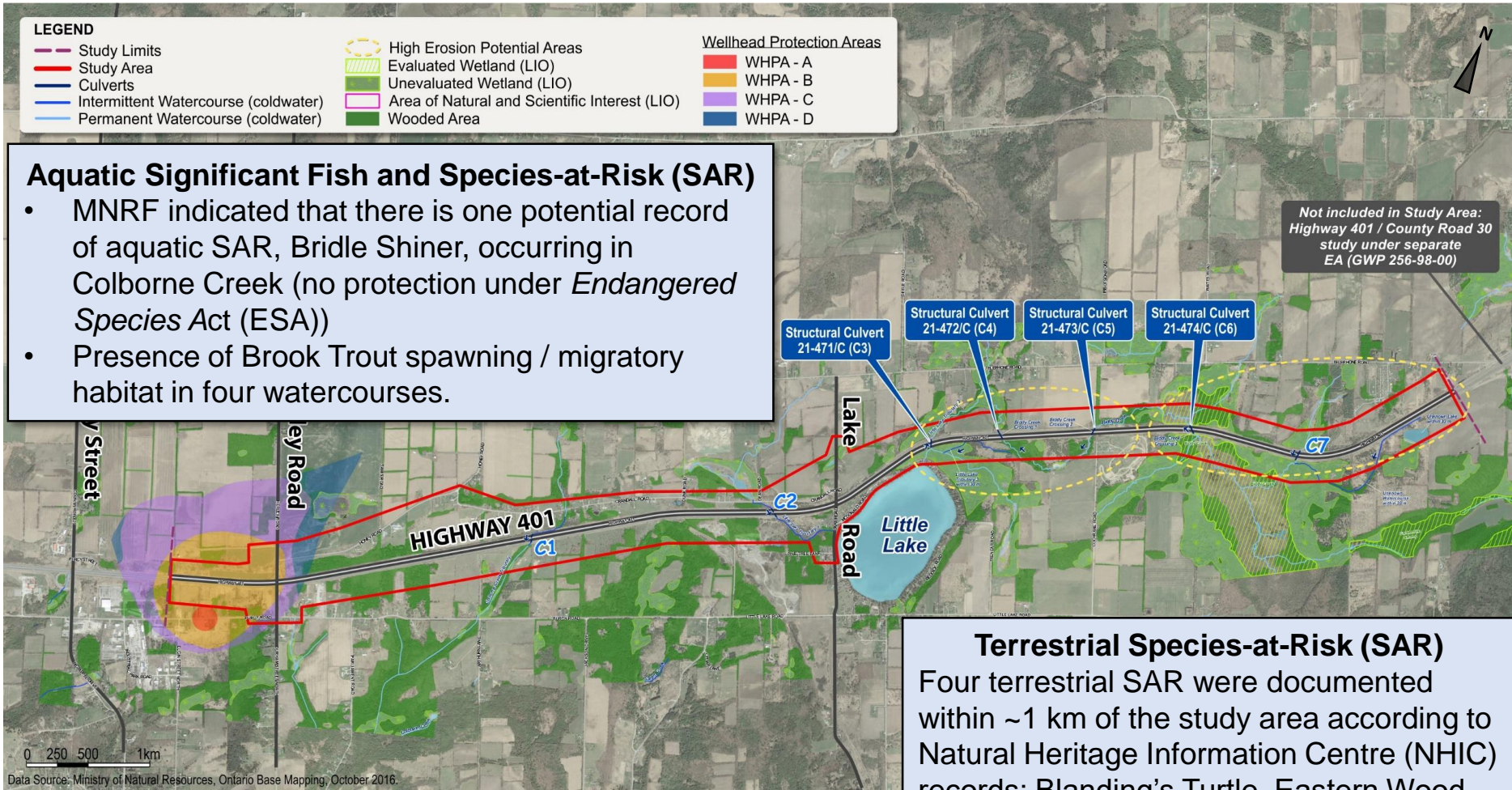
We are here



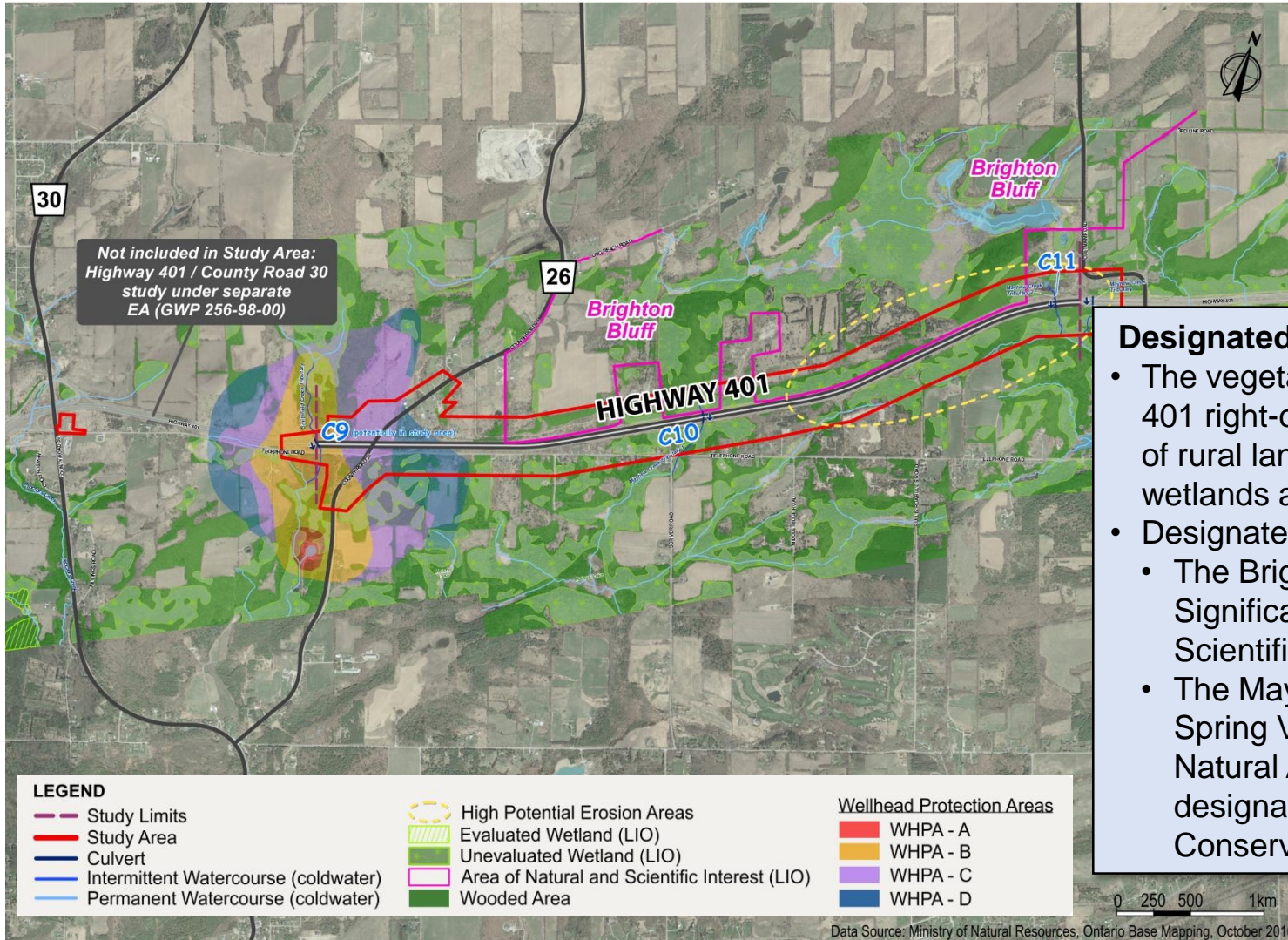
Completed Consultation Activities



Existing Environmental Conditions



Existing Environmental Conditions



Designated Vegetation Features

- The vegetation on the Highway 401 right-of-way (ROW) consists of rural land occupied by forests, wetlands and meadows.
- Designated features include:
 - The Brighton Bluff, Provincially Significant Area of Natural and Scientific Interest (ANSI)
 - The Mayhew Creek and Spring Valley Significant Natural Areas (both designated by the Lower Trent Conservation Authority)

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

Overview of Environmental Studies

List of Studies

- Cultural Heritage Resource Assessment
- Stage 1 Archaeology Assessment (AA)
- Fisheries Impact Assessment
- Terrestrial Impact Assessment
- Groundwater Assessment Report
- Stormwater Management Plan
- Landscape Composition Report
- Contamination Overview Study
- Air Quality and Greenhouse Gas Assessment Report
- Noise Assessment Report
- Designated Substances Survey
- Excess Materials Management Plan
- Erosion and Sediment Overview Risk Assessment

Cultural Heritage

A cultural heritage assessment is being completed and has identified during the field review 31 potential Cultural Heritage Landscapes and 28 potential Built Heritage Resources in the study area.

Archaeology

A Stage 1 Archaeological Assessment is being completed and has identified areas requiring further Stage 2 AA.

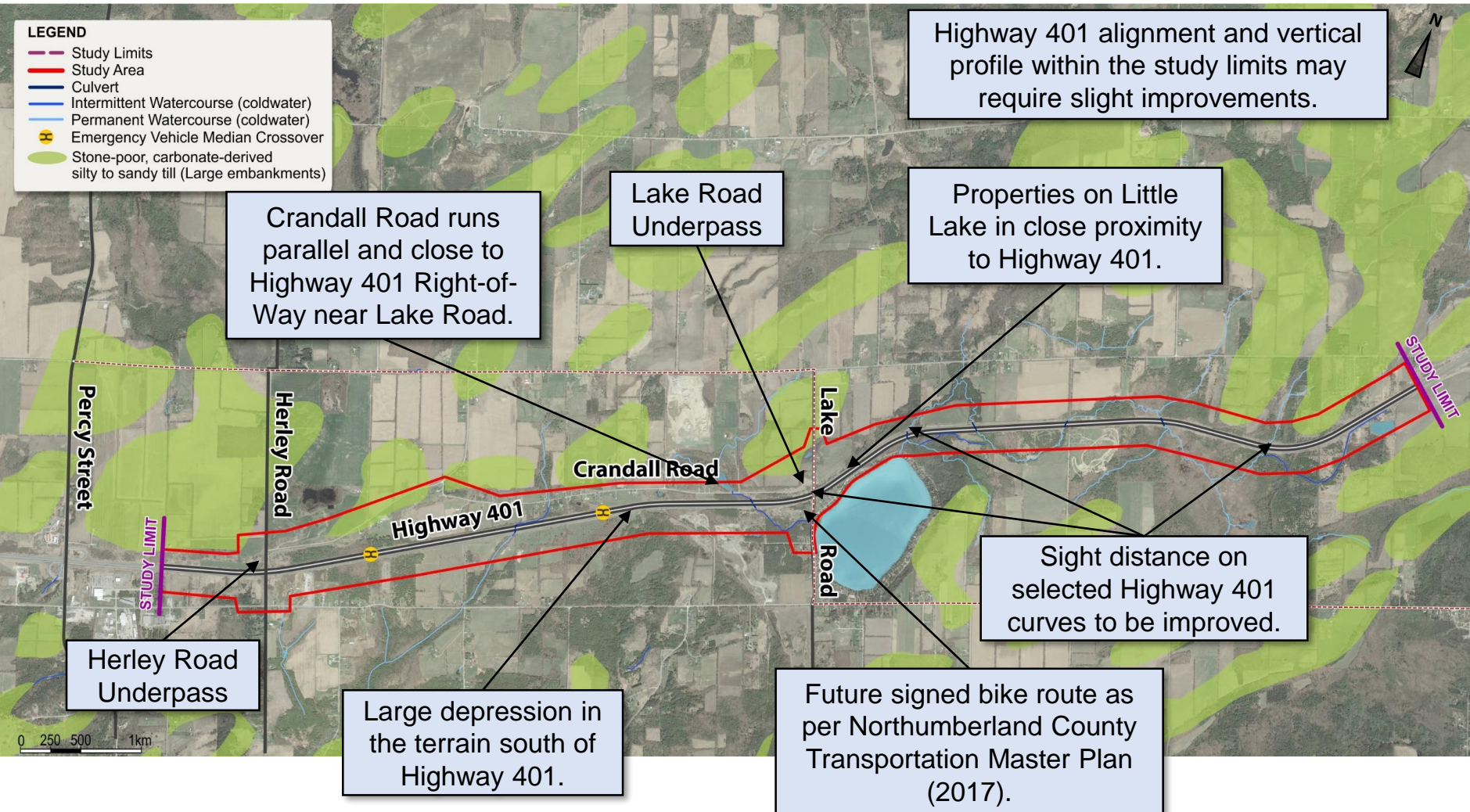
Contamination

A Contamination Overview Study is being completed and has identified properties with high and moderate potential for contamination exist within the study area.

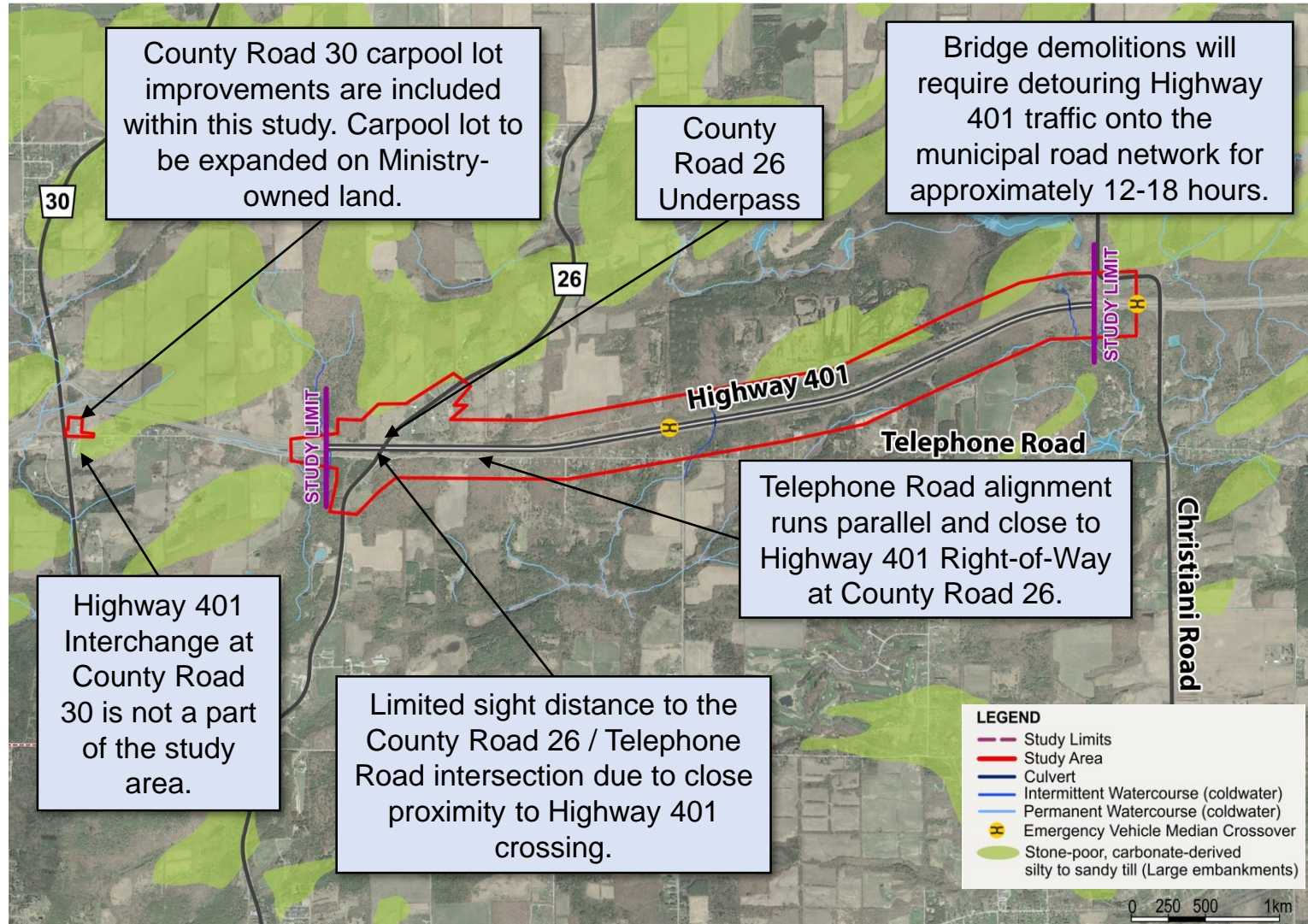
Noise

There are noise receptors close to Highway 401 north and south of the Highway. A noise assessment will be completed and will identify if noise mitigation is warranted as a result of the proposed highway improvements.

Key Issues and Opportunities



Key Issues and Opportunities





Summary of Challenges & Opportunities

CHALLENGES

End of Service Life



- The bridges and structural culverts in the study area are nearing the end of their service lives, and will require rehabilitation and/or replacement in the coming years.

Traffic Staging Accommodation



- The existing Highway 401 platform cannot accommodate the traffic staging to rehabilitate / replace the bridges and structural culverts.

OPPORTUNITIES

Safe Operation of the Highway 401 Corridor



- The study will assess existing bridges and structural culverts in the study area
- Develop appropriate rehabilitation or replacement strategies to maintain the safe operation of the Highway 401 corridor for the current and future planning horizons.

Future Ready

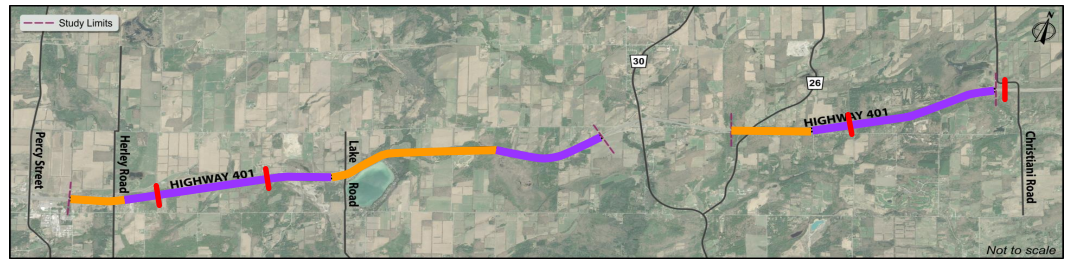


- For structural planning purposes the study will establish the future Highway 401 footprint for an interim six and ultimate eight lanes, to ensure that the bridges and structural culverts can be designed appropriately.

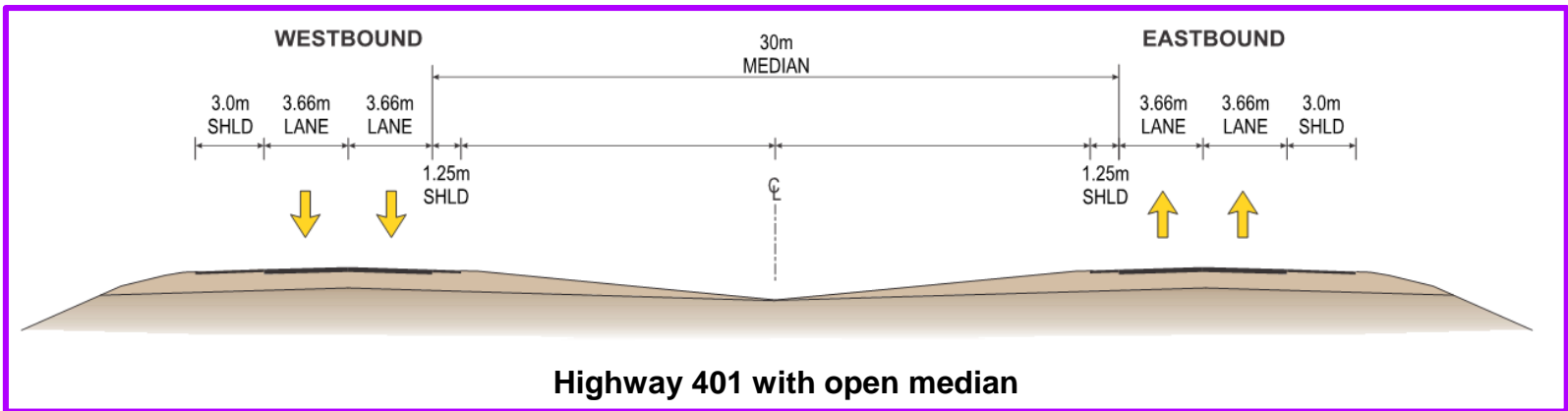
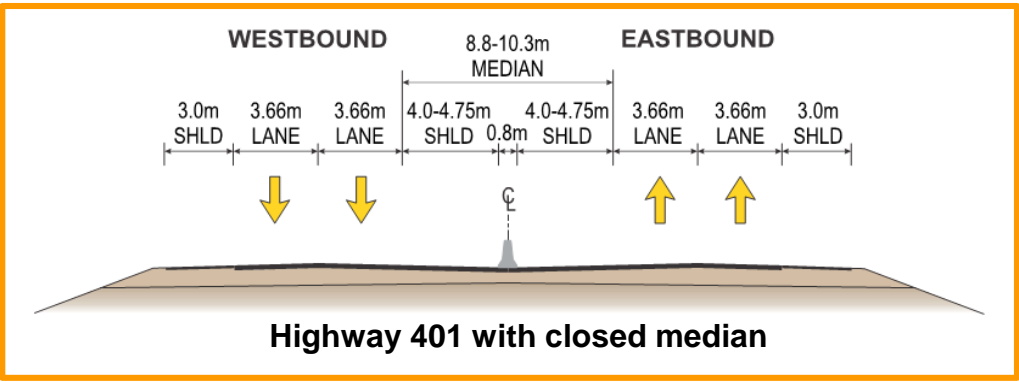
The timing of construction of this project is currently unknown.



Highway 401 Existing Cross Section

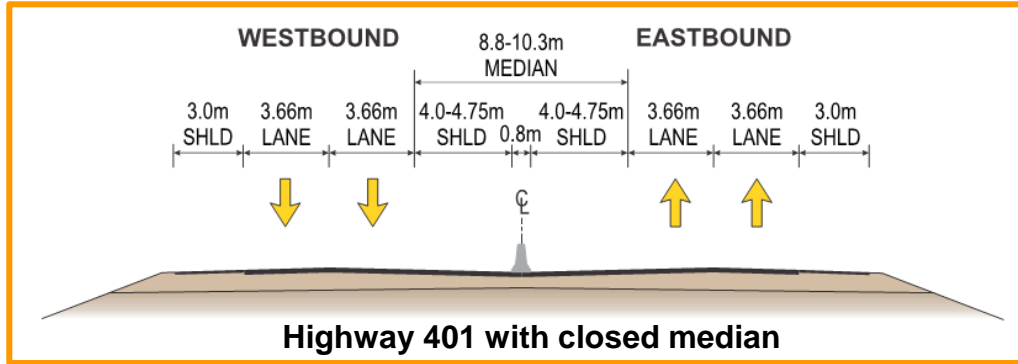


- Closed median
- Open median
- | Emergency median turnaround



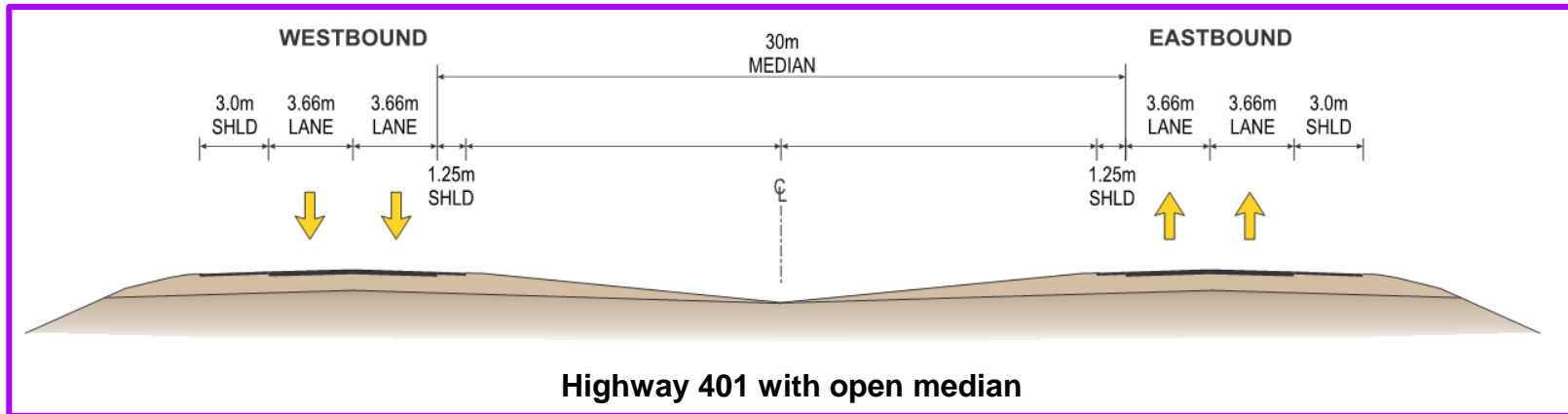


Highway 401 Existing Cross Section



Closed median

- Widening can only occur on the outside

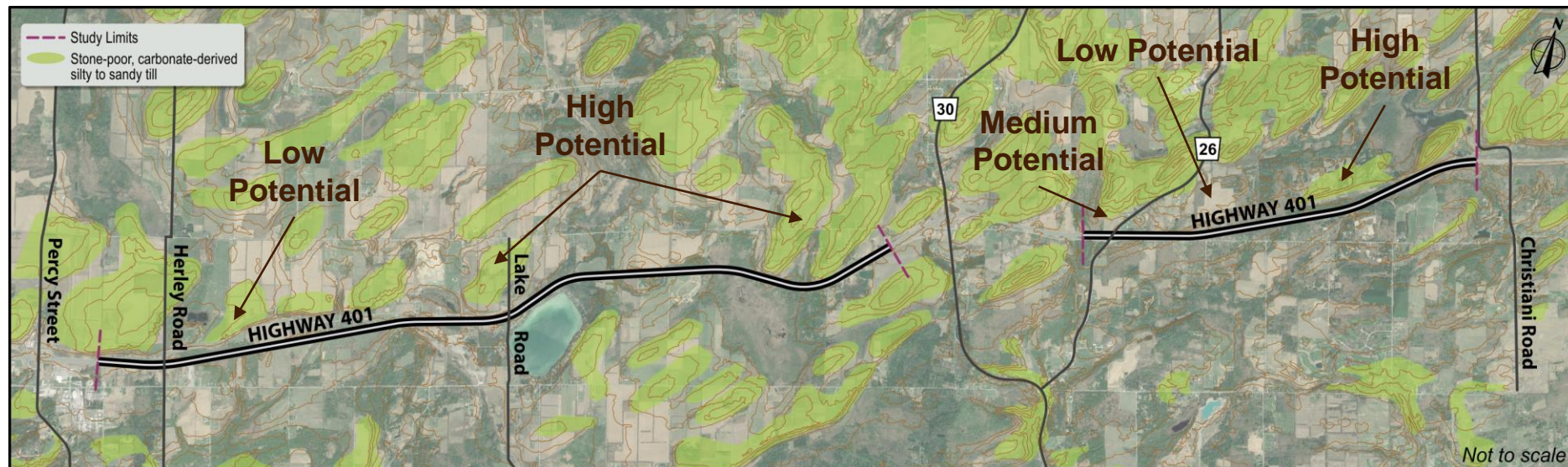


Open median

- If the median width is 22.5 m or less after widening to the inside, median barrier is required and emergency median turnarounds cannot be accommodated.
- A wide open median is preferred to median barrier since the barrier itself is a hazard.
- The median barrier prevents errant vehicles from crossing the median into oncoming traffic.

Erosion Potential of Soil

- Why does erodible soil matter?
 - Future highway widening will require earthworks (cuts and fills).
 - There is erodible soil in the study area.
 - With erodible soil, flatter slopes are required for any earth cuts/fill slopes, which results in larger property requirements.





Planning Alternatives

The Class EA process requires that planning alternatives be considered to ensure that there is reasonable and sufficient justification to proceed with the project.

Alternative	Recommendation
<p>Do Nothing: The bridges, culverts and Highway 401 would remain “as-is”. The structures would be subject to programmed maintenance activities (e.g., rehabilitations).</p>	<p>This alternative does not address the transportation issues because the aging bridges and culverts need to be replaced.</p> <p>Not Carried Forward</p>
<p>Transportation Demand Management (TDM): TDM strategies reduce overall demands on the highway network by shifting demands to time periods outside of the critical congestion periods, and shift demands to alternative modes of transportation (e.g., public transit, cycling and walking). Measures have been included in the transportation modelling used in this project, based on policy directions within the Provincial Growth Plan.</p>	<p>On its own, TDM strategies do not address the transportation issues.</p> <p>Not Carried Forward</p>
<p>Improve Adjacent Road Systems: Widening of adjacent regional and municipal roads would increase overall transportation network capacity yet would not support inter-regional trips.</p>	<p>This alternative would not address the transportation issues.</p> <p>Not Carried Forward</p>
<p>Improved Provincial Transportation Facility: Operational and safety improvements to optimize the movement and capacity of people and goods on Highway 401 through the project limits. This alternative includes replacement of the bridges and culverts, establishing the footprint of the Highway 401 for the interim six lanes and ultimate right lanes and carpool lot.</p>	<p>This alternative will be carried forward for further consideration.</p> <p>Carried Forward</p>

The Project Team is recommending that Improved Provincial Transportation Facility be carried forward for further consideration.

Alternatives Screening

The Project Team developed a number of crossing road bridge replacement alternatives for each crossing road location (Herley Road, Lake Road and County Road 26). Alternatives were also developed for the structural culverts in the study area. The bridges and structural culverts in the study area are aging and require replacement.

The Project Team also developed a number of different alternatives for the future widening of Highway 401. These alternatives were developed based on the presence of a median, erosion potential of the soil and site conditions.

Following the development of alternatives, the Project Team screened each alternative by looking at key advantages and disadvantages to determine if an alternative should be carried forward for further development and analysis.

An additional round of screening may be completed following PIC #1.



Long List of Alternatives

Highway 401 Future Widening Alternatives

The timing of future widening is currently unknown.

Section 3

- Closed median
- Mixed low to high erosion potential

Section 4

- Closed median
- High erosion potential

Section 6

- Closed median
- Medium erosion potential



Section 1

- Open median
- Low erosion potential
- Two existing median turnarounds
- Tie into west study limit

Section 2

- Open median
- Low erosion potential
- Large fill on south side

Section 5

- Open median
- High erosion potential
- One existing median turnaround
- Large drumlins on north side
- Large grade difference between EB and WB alignments

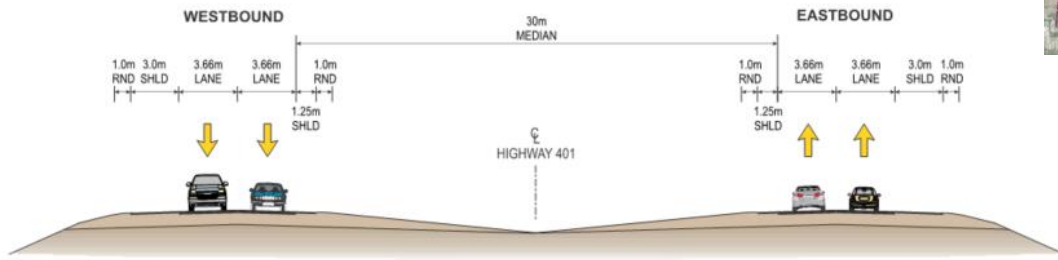
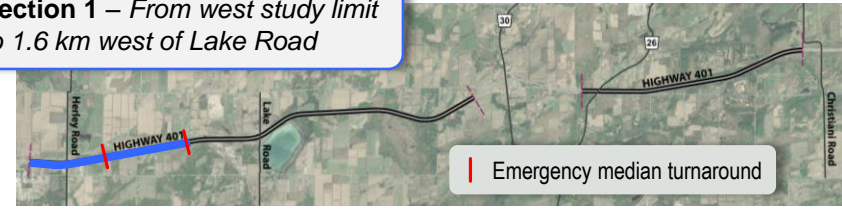
Section 7

- Open median
- Mixed low to high erosion potential
- Drumlins north of the highway
- One existing median turnaround

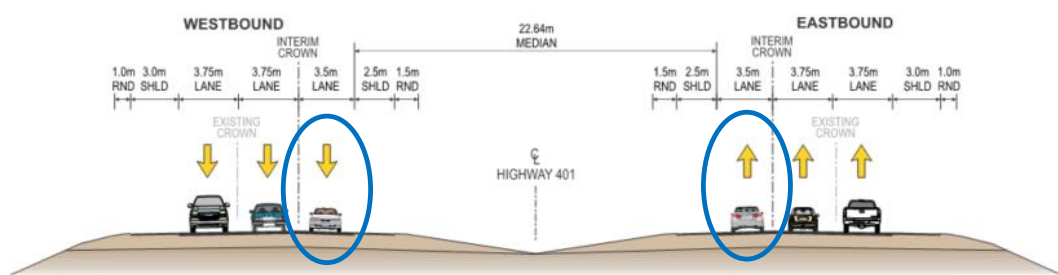
Long List of Alternatives

Highway 401 Future Widening Alternatives

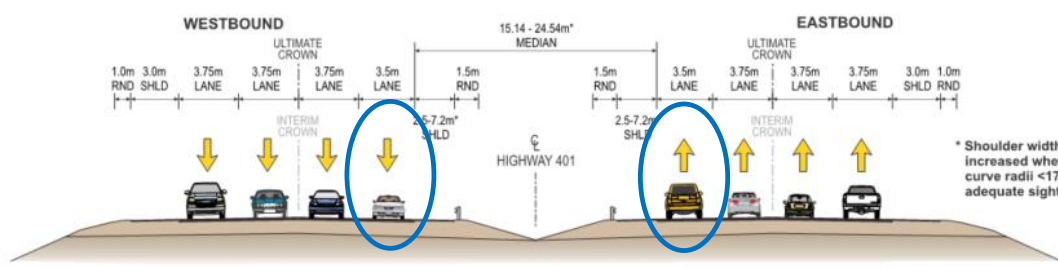
Section 1 – From west study limit to 1.6 km west of Lake Road



Existing



Interim - 6-Lane



Ultimate - 8-Lane

* Shoulder widths may be increased where horizontal curve radii <1700 m, to provide adequate sight distance.

○ Added lanes

Section 1 - Alternative 1 (of 2)

Widen inside only

Advantages

- Minimizes property and potential environmental impacts;
- Lower cost than Alternative 2;
- Minimizes cuts/fills outside of the existing highway footprint.

Disadvantages

- Double median barriers are required in the Ultimate condition, which are less desirable than an open median;
- The two existing emergency median turnarounds are precluded in the Ultimate condition.

Recommendation

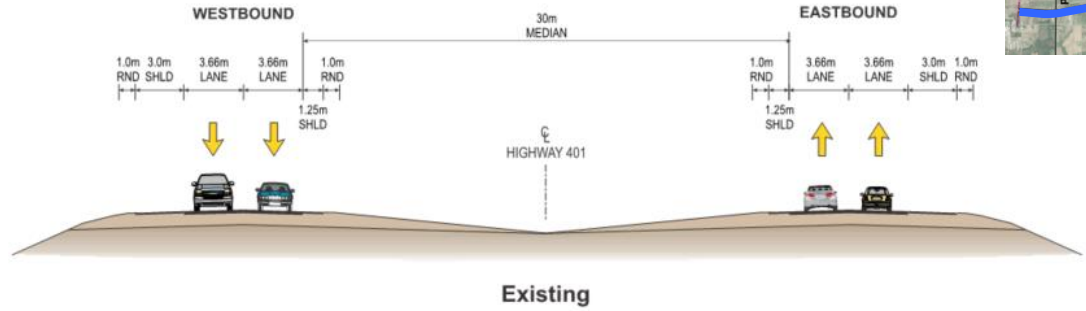
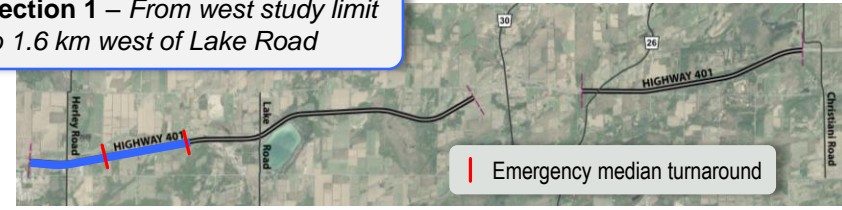
Do not carry forward



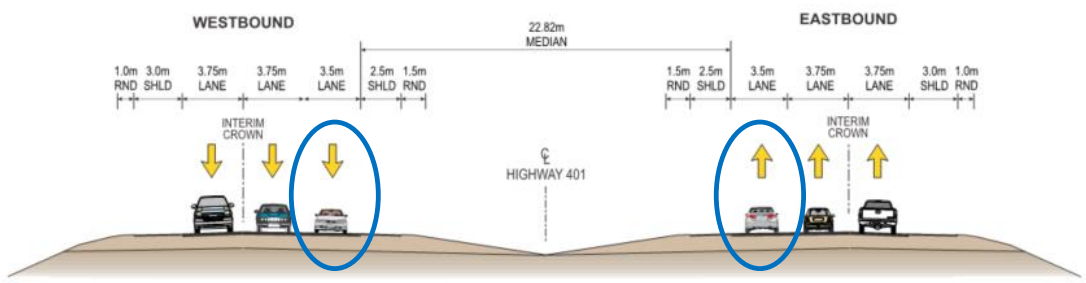
Long List of Alternatives

Highway 401 Future Widening Alternatives

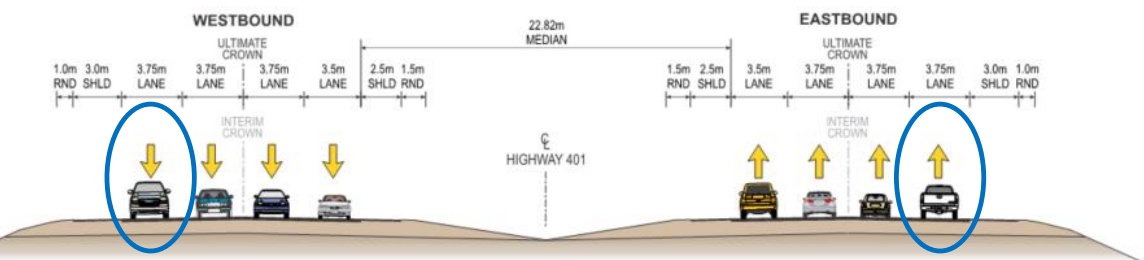
Section 1 – From west study limit to 1.6 km west of Lake Road



Existing



Interim - 6-Lane



Ultimate - 8-Lane

Added lanes

Section 1 - Alternative 2 (of 2)

Widen inside in the Interim and widen outside in the Ultimate

Advantages

- Open median is retained in the Ultimate condition (no median barrier needed);
- The two existing emergency median turnarounds can be accommodated.

Disadvantages

- Larger potential property and potential environmental impacts;
- Higher cost than Alternative 1;
- Some cuts/fills outside of the existing highway footprint.

Recommendation

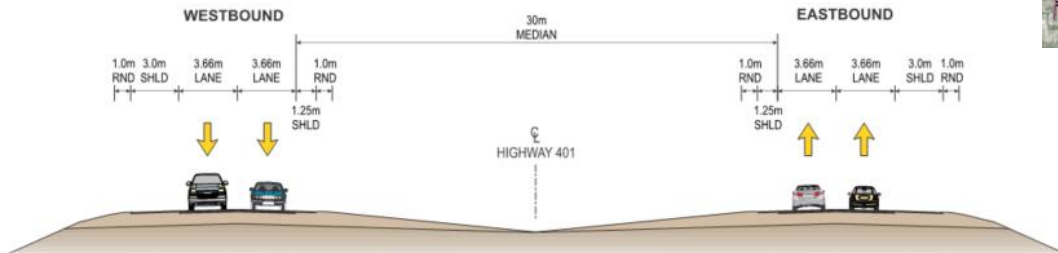
Carry forward as the preferred alternative



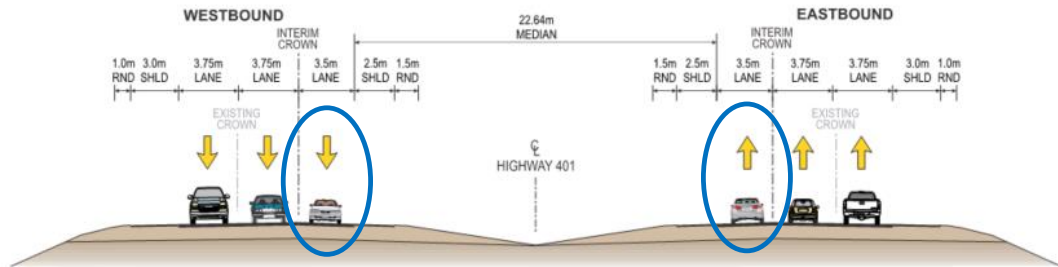
Long List of Alternatives

Highway 401 Future Widening Alternatives

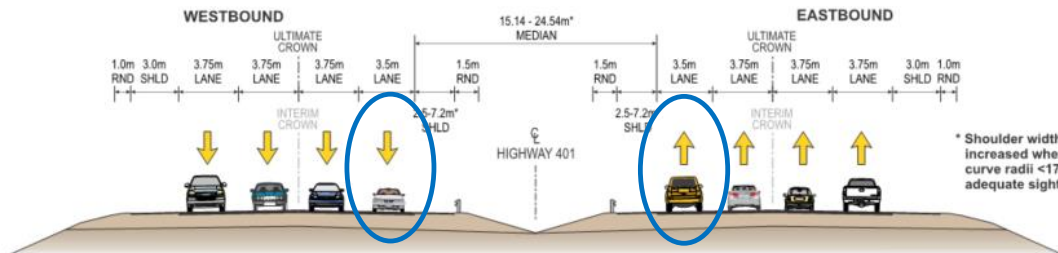
Section 2 – From 1.6 km west of Lake Road to 0.4 km west of Lake Road



Existing



Interim - 6-Lane



Ultimate - 8-Lane

○ Added lanes

Section 2 – Alternative 1 (of 3) Widen inside only

Advantages

- Minimizes property and potential environmental impacts;
- Lowest cost;
- Minimizes large fill south of the highway.

Disadvantages

- Double median barriers are required in the Ultimate condition, which are less desirable than an open median.

Recommendation

Carry forward for further study

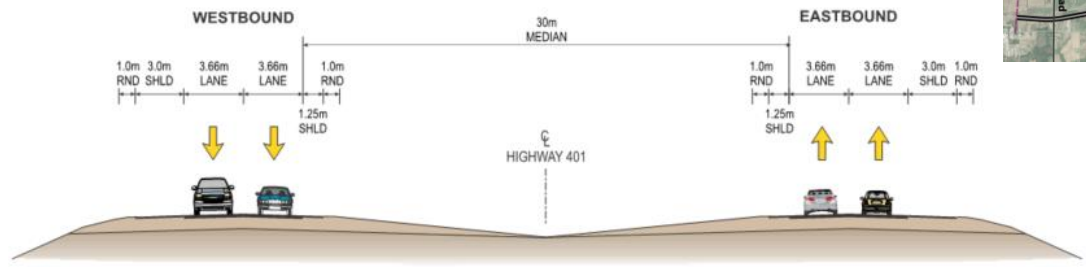


* Shoulder widths may be increased where horizontal curve radii <1700 m, to provide adequate sight distance.

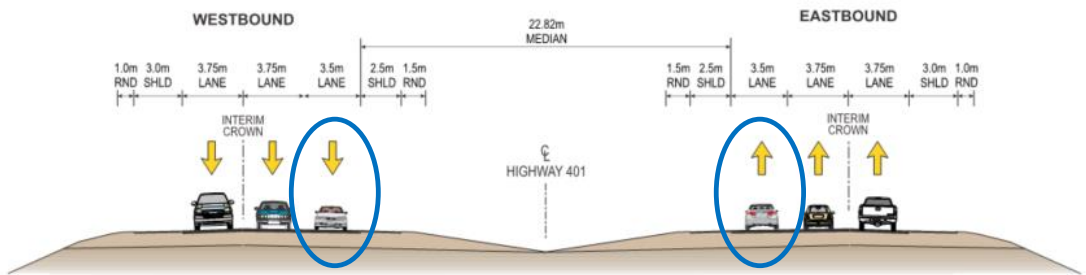
Long List of Alternatives

Highway 401 Future Widening Alternatives

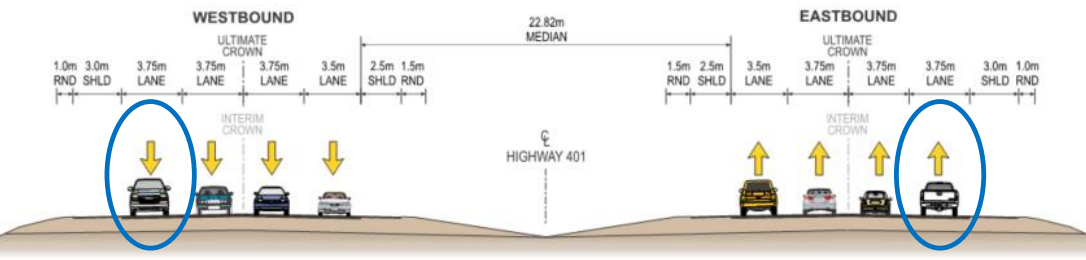
Section 2 – From 1.6 km west of Lake Road to 0.4 km west of Lake Road



Existing



Interim - 6-Lane



Ultimate - 8-Lane

○ Added lanes

Section 2 – Alternative 2 (of 3)
 Widen inside in the Interim and widen outside in the Ultimate

Advantages

- Open median is retained in the Ultimate condition (no median barrier needed);

Disadvantages

- Moderate potential property impacts;
- Larger potential environmental impacts;
- Higher cost than Alternative 1;
- Large fill required south of the highway.

Recommendation

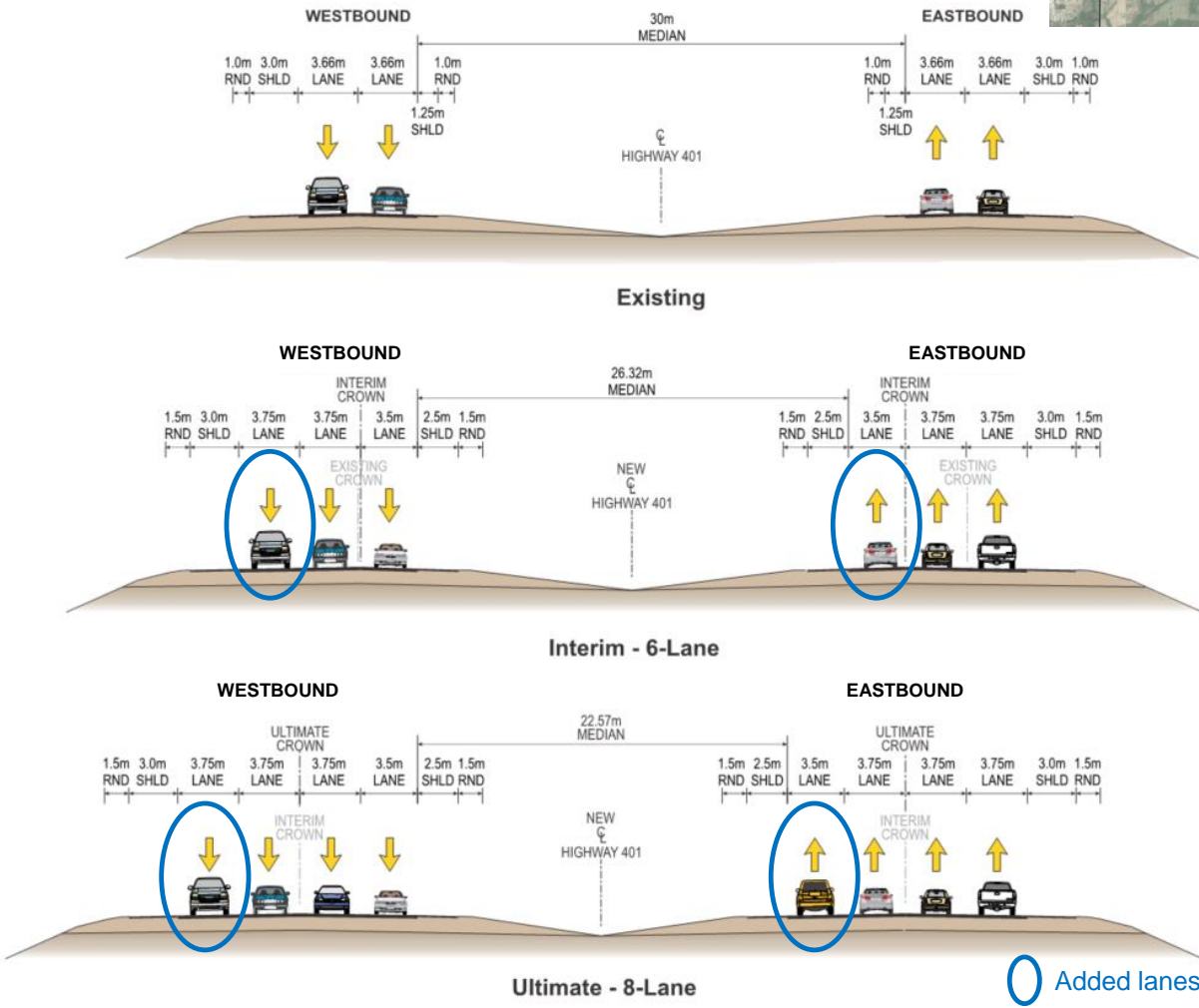
Carry forward for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 2 – From 1.6 km west of Lake Road to 0.4 km west of Lake Road



Section 2 – Alternative 3 (of 3) Widen to the north

Advantages

- Open median is retained in the Ultimate condition (no median barrier needed);
- Minimizes large fill south of the highway.

Disadvantages

- Largest potential property impacts;
- Larger potential environmental impacts (including wetland impact);
- Higher cost than Alternative 1.

Recommendation

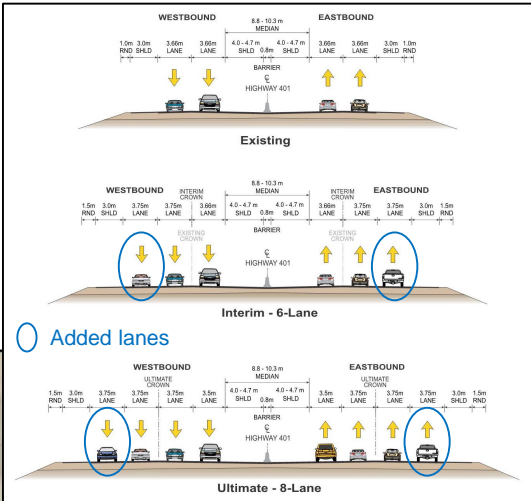
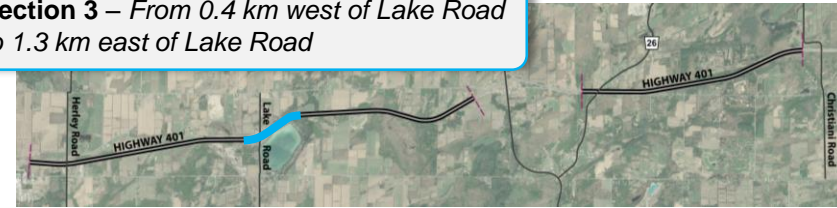
Carry forward
 for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 3 – From 0.4 km west of Lake Road to 1.3 km east of Lake Road



*Median shoulder may be widened to up to 7.2 m

Section 3 – Alternative 1 (of 3)

Widen outside only and widen median shoulders

Advantages

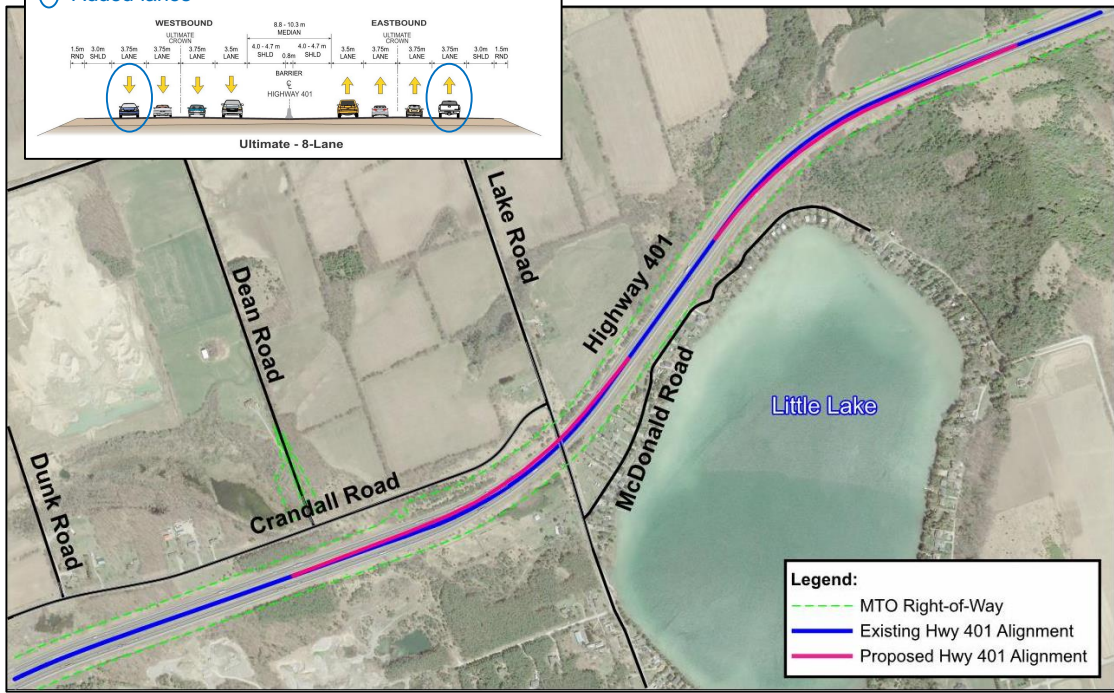
- Greater potential to mitigate Crandall Road realignment and property impacts on the north side;
- Minimizes potential property impacts outside of existing ROW;
- Sight distance on curves improved to the design standard;
- Relatively low cost;
- Lower anticipated construction difficulty.

Disadvantages

- Offset between highway and Little Lake properties smaller than Alternatives 2 and 3;
- Maintains the existing horizontal curves, which do not meet desirable standards.

Recommendation

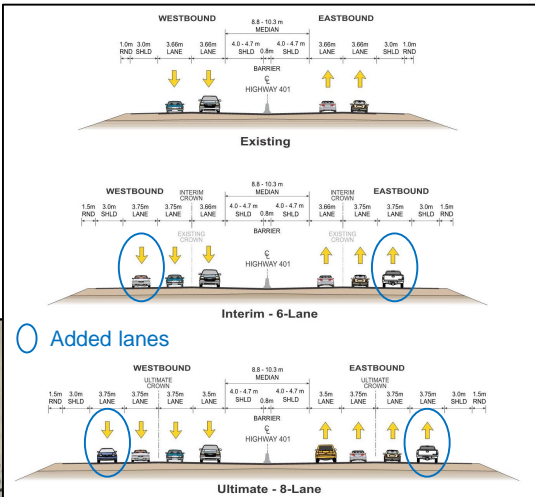
Carry forward for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 3 – From 0.4 km west of Lake Road to 1.3 km east of Lake Road



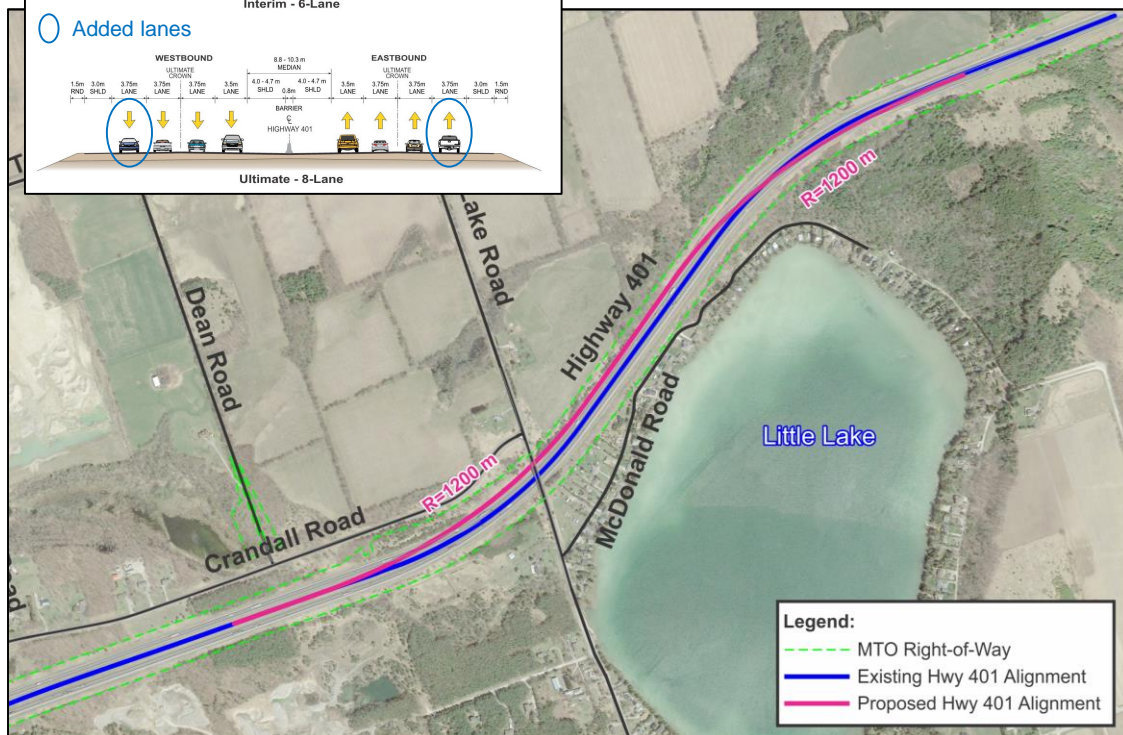
*Median shoulder may be widened to up to 4.7 m

Section 3 – Alternative 2 (of 3)
Widen outside only and realign using two 1200 m radius curves

- Advantages**
- Offset between highway and Little Lake properties greater than Alternative 1;
 - Improves the existing horizontal curves relative to existing, but not to the desirable standard.

- Disadvantages**
- Significant realignment of Crandall Road and property impacts on the north side, with greater cost or difficulty to mitigate these impacts;
 - Greater potential property impacts outside of existing ROW;
 - High cost;
 - High construction difficulty due to highway realignment, traffic staging challenges, and significant earthworks.

Recommendation
 Carry forward for further study



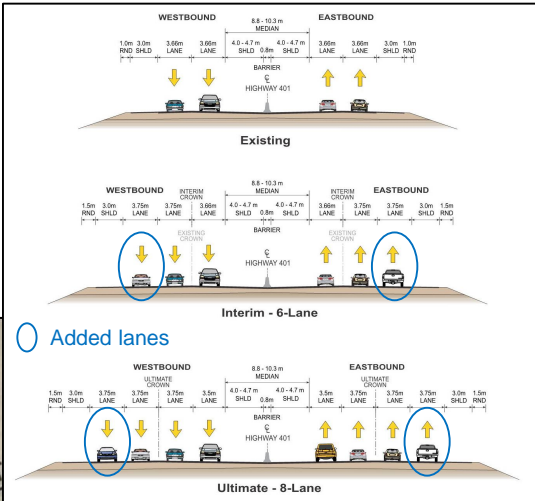
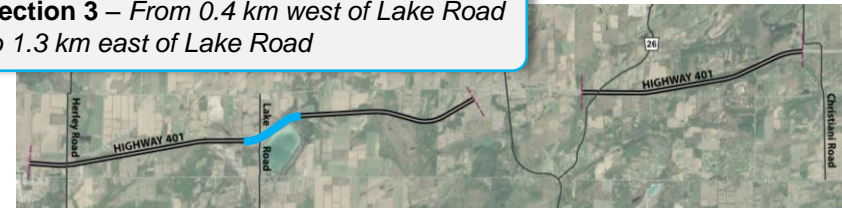
Legend:

- MTO Right-of-Way
- Existing Hwy 401 Alignment
- Proposed Hwy 401 Alignment

Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 3 – From 0.4 km west of Lake Road to 1.3 km east of Lake Road

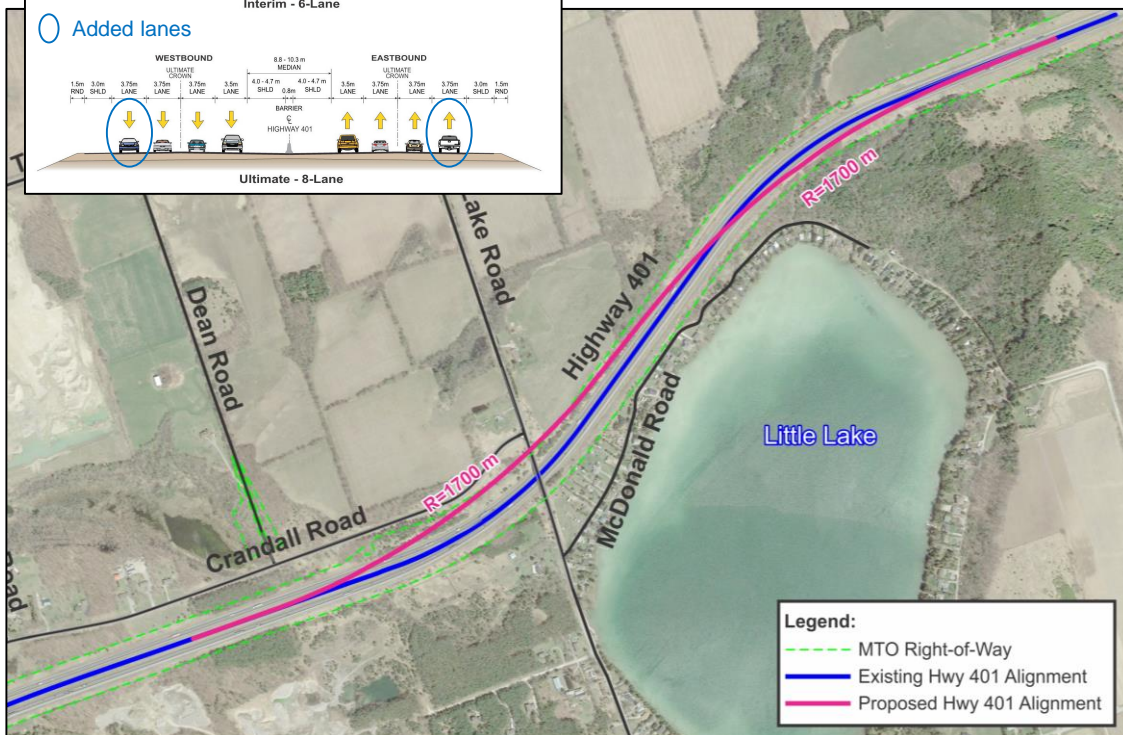


Section 3 – Alternative 3 (of 3)
Widen outside only and realign using two 1700 m radius curves

- Advantages**
- Offset between highway and Little Lake properties greater than Alternative 1 and 2;
 - Improves the existing horizontal curves to the desirable standard.

- Disadvantages**
- Significant realignment of Crandall Road and property impacts on the north side, with greater cost or difficulty to mitigate these impacts;
 - Greater potential property impacts outside of existing ROW;
 - Highest cost;
 - Little to no reuse of the existing highway;
 - High construction difficulty due to highway realignment, traffic staging challenges, and significant earthworks.

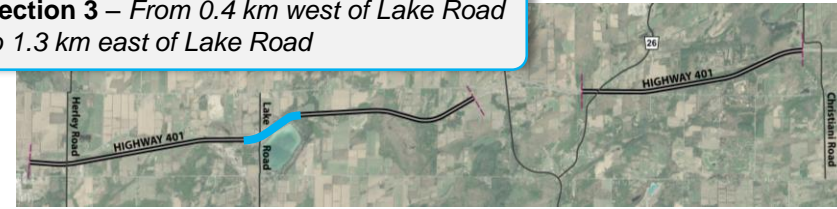
Recommendation
 Carry forward for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

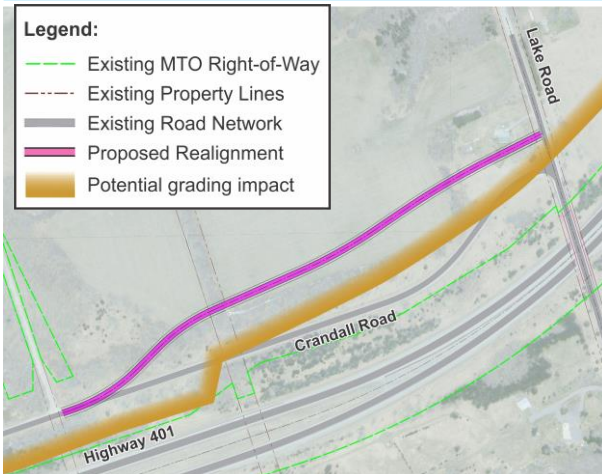
Section 3 – From 0.4 km west of Lake Road to 1.3 km east of Lake Road



Section 3 – Crandall Road realignment sub-alternatives

Legend:

- Existing MTO Right-of-Way
- Existing Property Lines
- Existing Road Network
- Proposed Realignment
- Potential grading impact



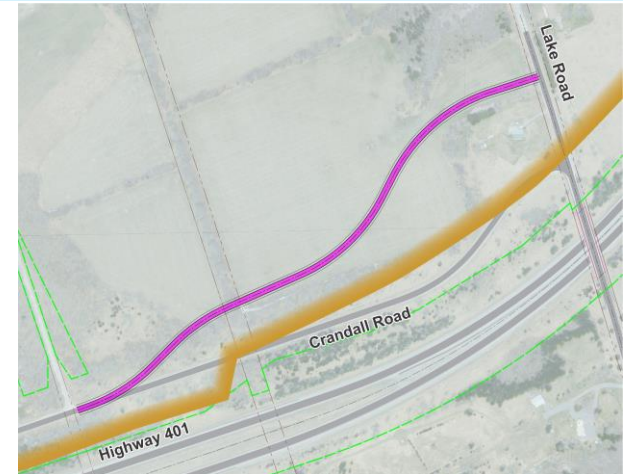
Alternative 1
for Highway 401 Alternative 1

- Highway widening may result in grading impacts beyond the existing Crandall Road



Alternative 2
for Highway 401 Alternatives 2 and 3

- Larger Highway 401 realignment results in larger potential grading impacts and Crandall Road realignment



Alternative 3
For Highway 401 Alternatives 1, 2, and 3

- Larger grading/property impacts and Crandall Road realignment than Alternatives 1 and 2

Recommendation

These alternatives are being further developed and will undergo further evaluation in combination with the preferred Highway 401 widening alternative. Further evaluation will be presented as part of the short-list of alternatives at PIC #2.

Long List of Alternatives

Highway 401 Future Widening Alternatives

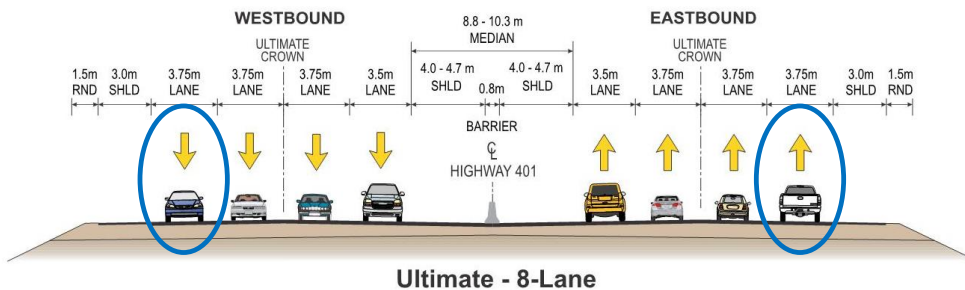
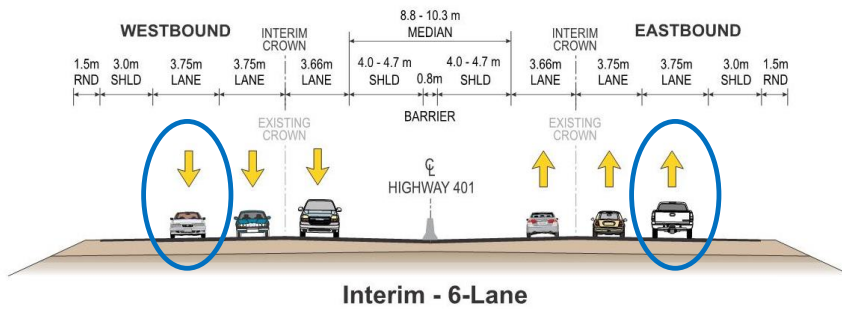
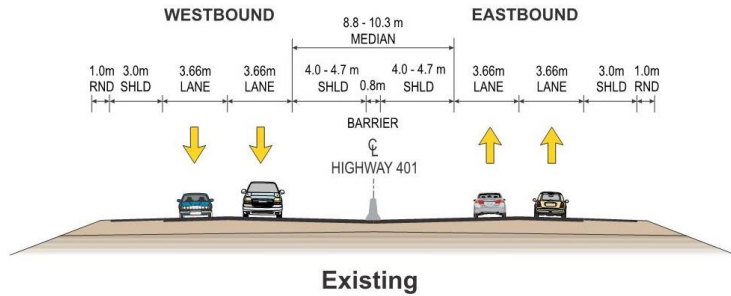
Section 4 – From 1.3 km east of Lake Road to 2.8 km east of Lake Road



Section 4 – Alternative 1 (of 1) Widen outside only

- There is an existing closed median (narrow median with concrete barrier in the median).
- The only alternative is to widen to 6-lanes and 8-lanes by adding lanes to the outside of existing.

Recommendation
 Carry forward as the preferred alternative

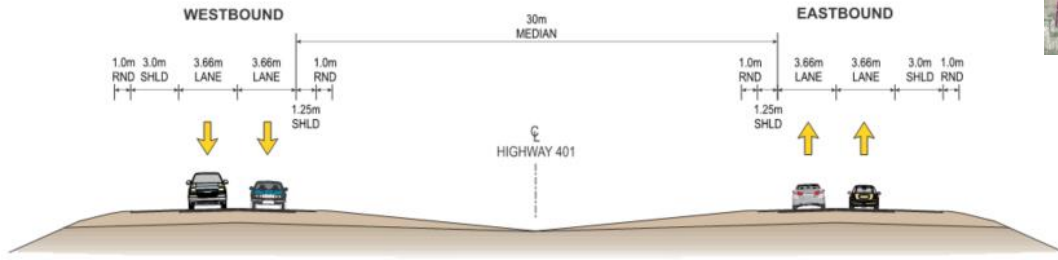


Added lanes

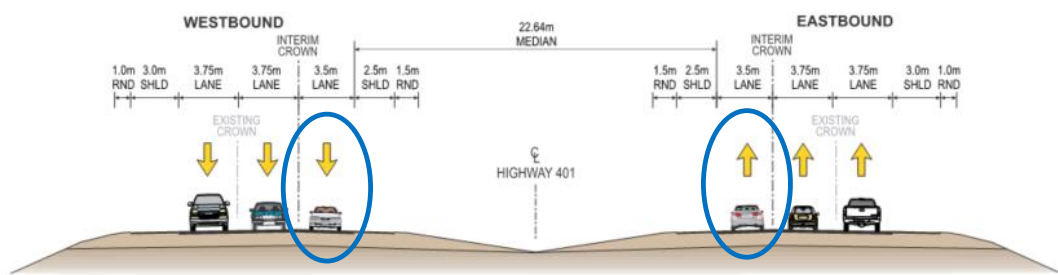
Long List of Alternatives

Highway 401 Future Widening Alternatives

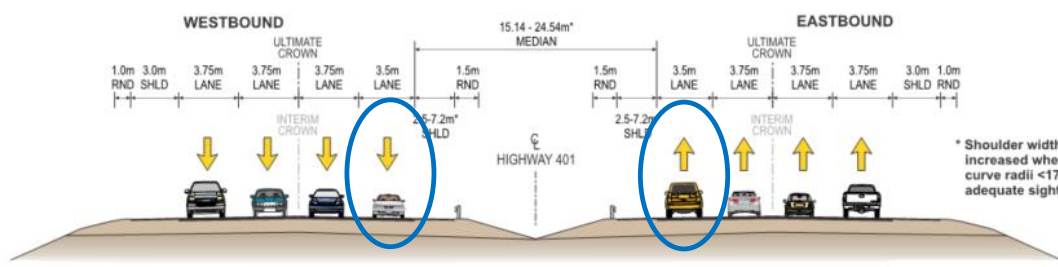
Section 5 – From 2.8 km east of Lake Road to County Road 30 west study limit



Existing



Interim - 6-Lane



Ultimate - 8-Lane

* Shoulder widths may be increased where horizontal curve radii <1700 m, to provide adequate sight distance.

○ Added lanes

Section 5 – Alternative 1 (of 4) Widen inside only

- Advantages**
- Minimizes property and environmental impacts;
 - Minimizes large cuts north of the highway.

- Disadvantages**
- Double median barriers required in the Ultimate condition, which are less desirable than an open median;
 - Limited space in the median does not provide enough space to grade the slope and would require installation of a wall.

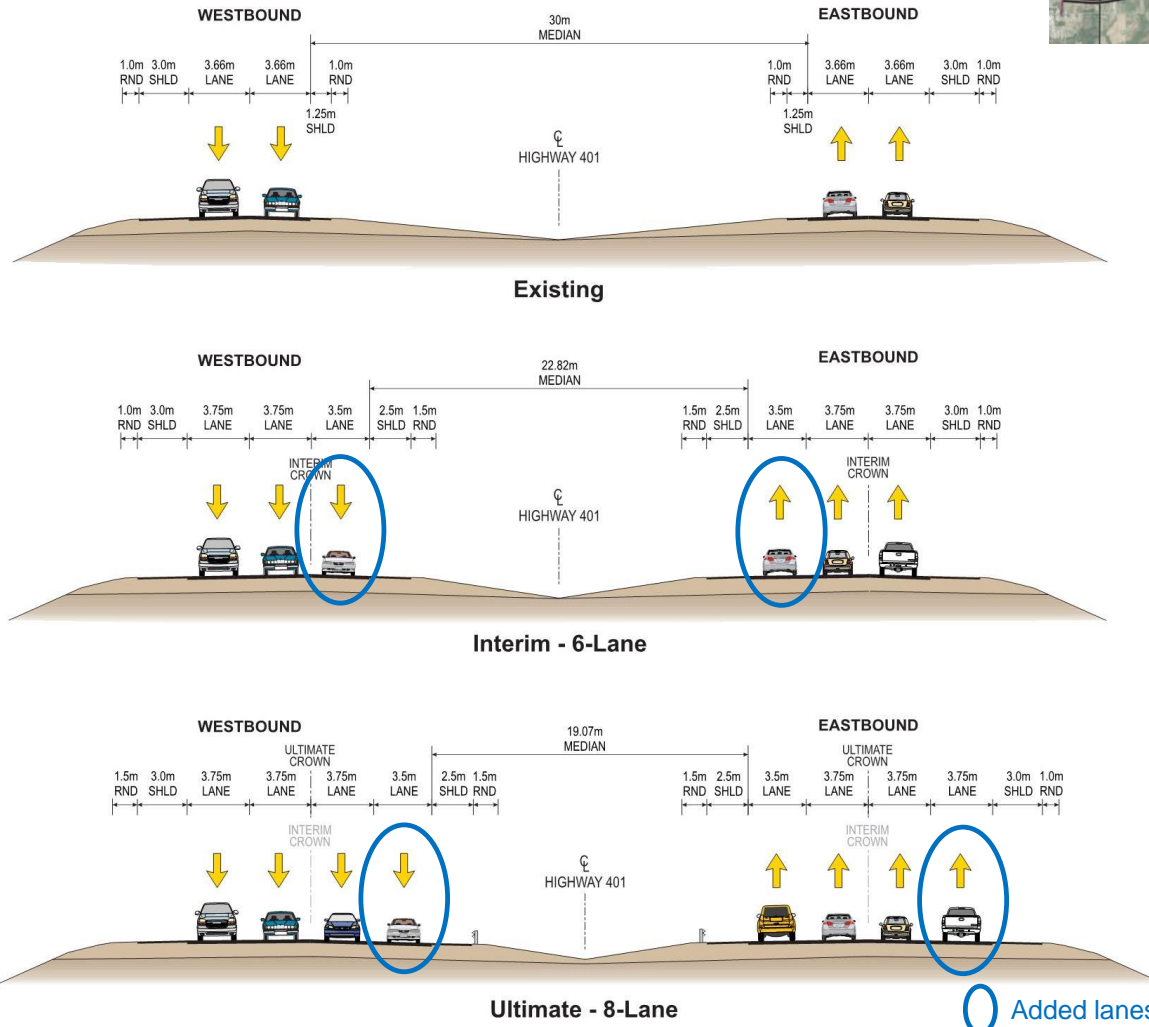
Recommendation
 Do not carry forward



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 5 – From 2.8 km east of Lake Road to County Road 30 west study limit



Section 5 – Alternative 2 (of 4)
 Widen inside in the Interim, and widen WB inside and EB outside in the Ultimate

- Advantages**
- Smaller property and potential environmental impacts;
 - Minimizes large cuts north of the highway;
 - Easier to tie into the County Road 30 design (completed under previous EA) than Alternative 3.

- Disadvantages**
- Double median barriers required in the Ultimate condition, which are less desirable than an open median;
 - Limited space in the median does not provide enough space to grade the slope and would require installation of a wall;
 - Relatively high cost due to installation and maintenance of median wall.

Recommendation
 Do not carry forward



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 5 – From 2.8 km east of Lake Road to County Road 30 west study limit

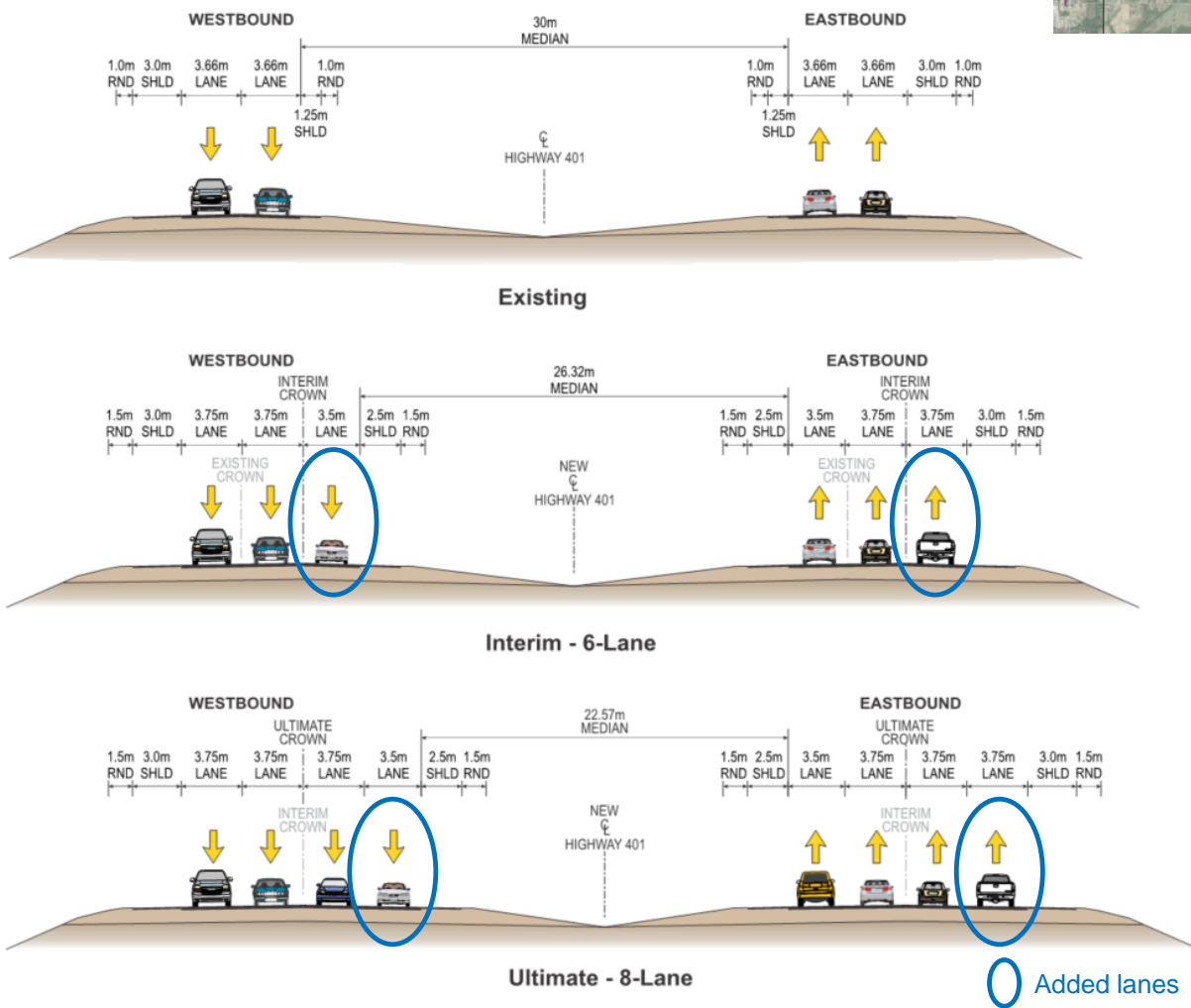


Section 5 – Alternative 3 (of 4) Widen to the south

- Advantages**
- Open median is retained in the Ultimate condition (no median barrier needed);
 - Minimizes large cuts north of the highway.

- Disadvantages**
- Large property impacts and potential environmental impacts, including wetland impact (greater than Alternatives 1 and 4);
 - Moderate cost;
 - Harder to tie into the County Road 30 design (completed under previous EA) than Alternative 2 and 4.

Recommendation
 Carry forward for further study

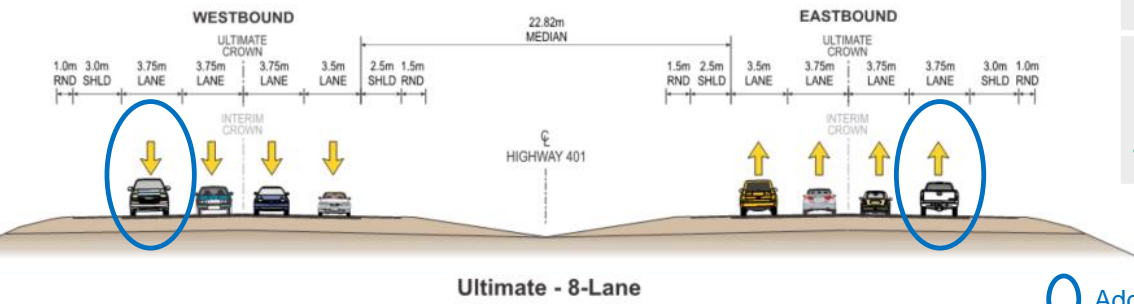
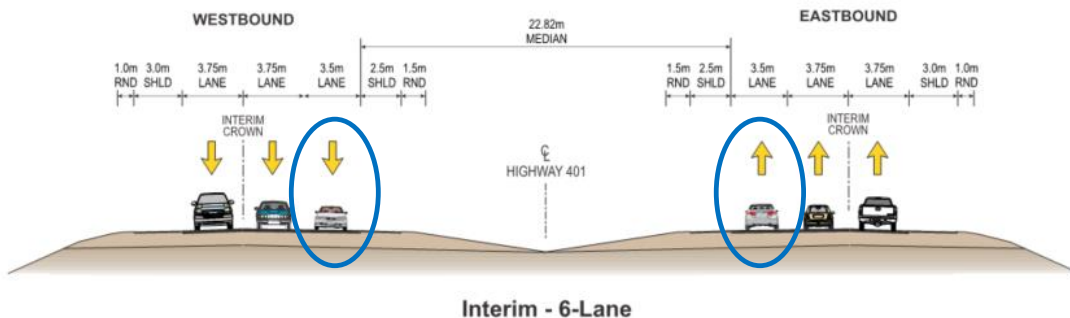
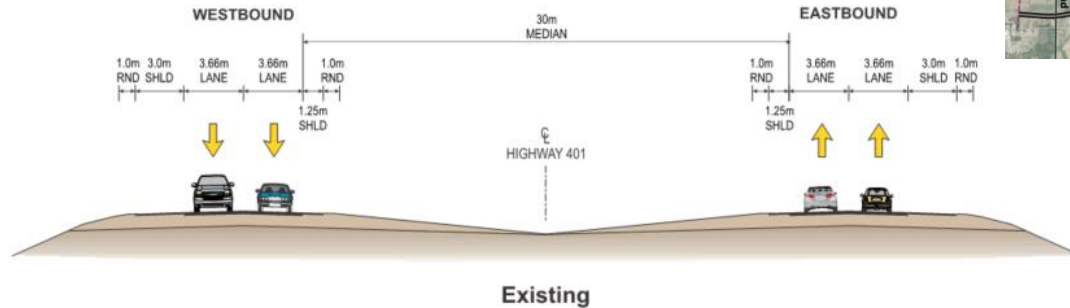
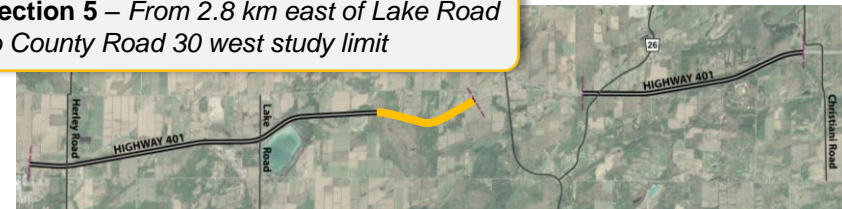



○ Added lanes

Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 5 – From 2.8 km east of Lake Road to County Road 30 west study limit



Section 5 – Alternative 4 (of 4)
Widen inside in the Interim and widen outside in the Ultimate

Advantages

- Open median is retained in the Ultimate condition (no median barrier needed);
- Easiest to tie into the County Road 30 design (completed under previous EA).

Disadvantages

- Large property impacts and potential environmental impacts (greater than Alternatives 1 and 4);
- Relatively high cost;
- Large cuts north of the highway.

Recommendation
 Carry forward for further study

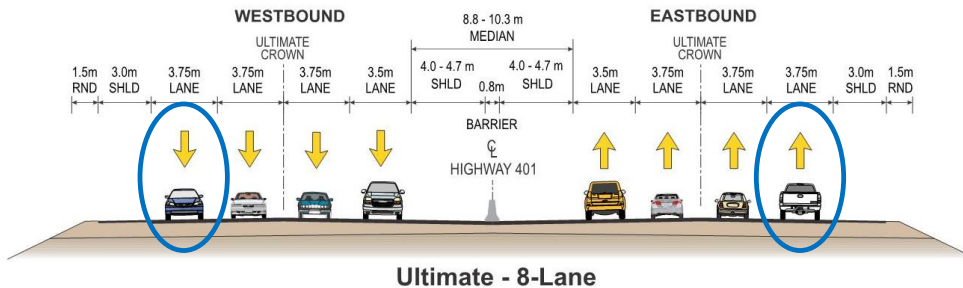
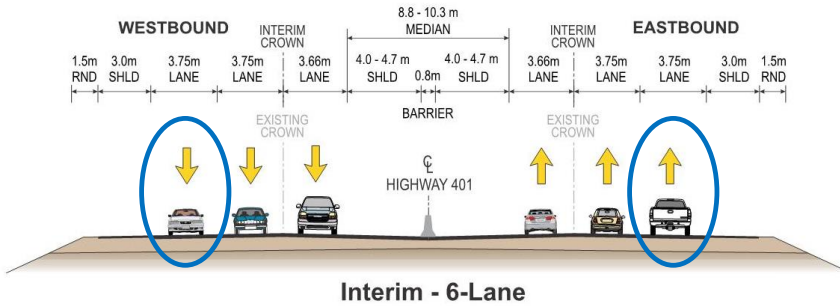
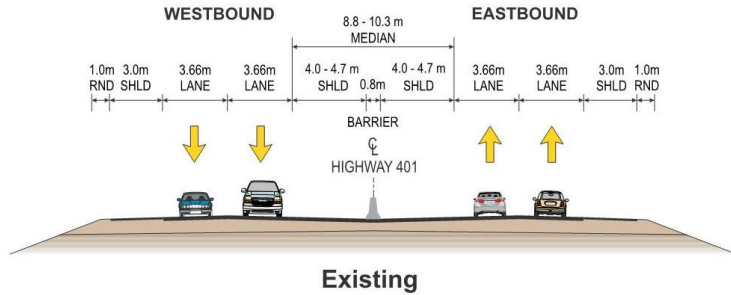
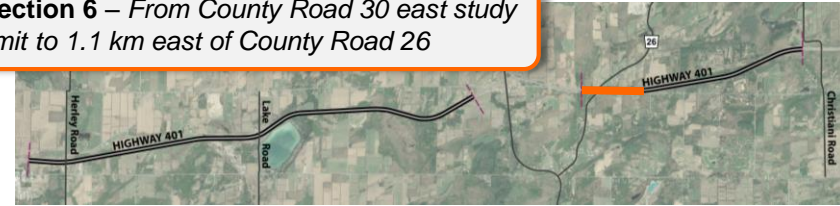


○ Added lanes

Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 6 – From County Road 30 east study limit to 1.1 km east of County Road 26



Added lanes

Section 6 – Alternative 1 (of 1) Widen outside only

- There is an existing closed median (narrow median with concrete barrier in the median).
- The only alternative is to widen to 6-lanes and 8-lanes by adding lanes to the outside of existing.

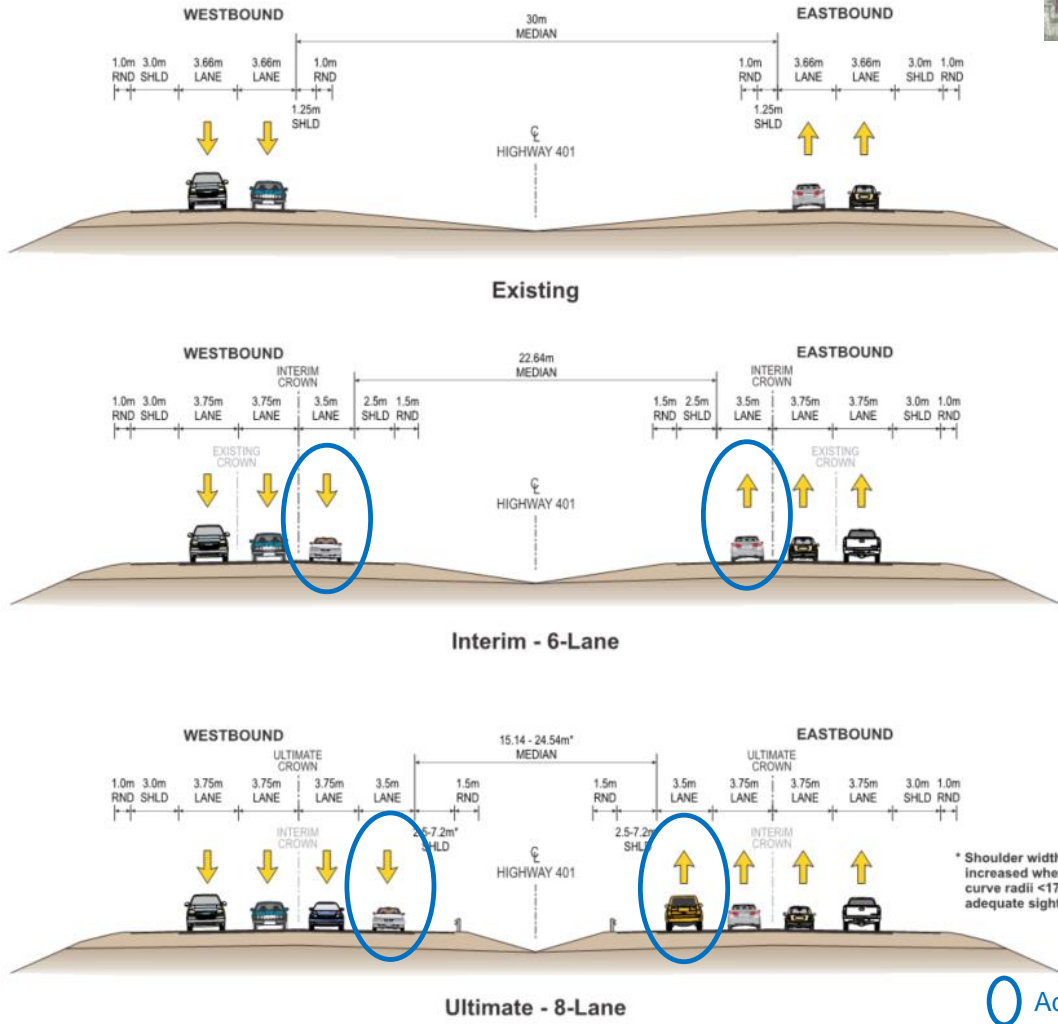
Recommendation
 Carry forward as the preferred alternative



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 7 – From 1.1 km east of County Road 26 to east study limit



Section 7 – Alternative 1 (of 5) Widen inside only

- Advantages**
- Minimizes property impacts;
 - Minimizes potential impacts to the natural environment;
 - Lowest cost;
 - Minimizes large cuts north of highway.

- Disadvantages**
- Double median barriers required in the Ultimate condition, which are less desirable than an open median;
 - Emergency median turnarounds, including the one existing turnaround, are precluded.

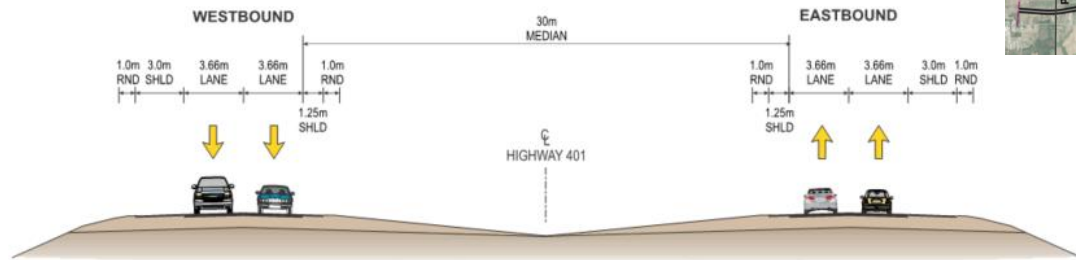
Recommendation
 Do not carry forward



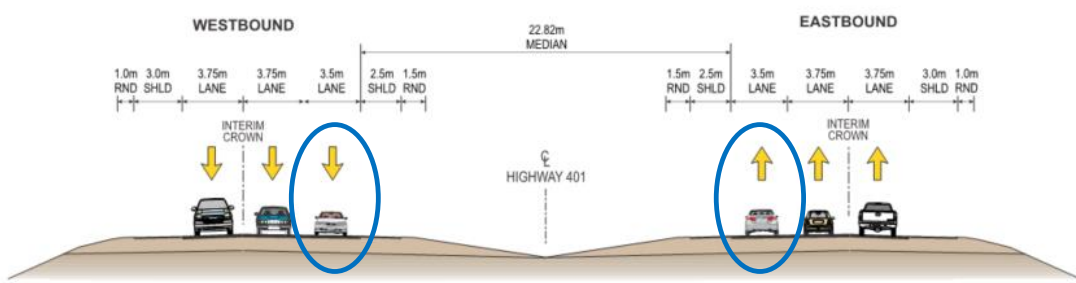
Long List of Alternatives

Highway 401 Future Widening Alternatives

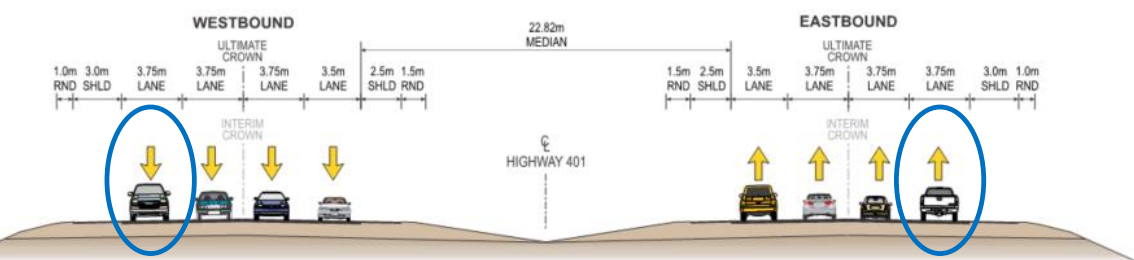
Section 7 – From 1.1 km east of County Road 26 to east study limit



Existing



Interim - 6-Lane



Ultimate - 8-Lane

○ Added lanes

Section 7 – Alternative 2 (of 5) Widen inside in the Interim and widen outside in the Ultimate

Advantages

- Open median is retained in the Ultimate condition;
- Emergency median turnarounds, including the one existing turnaround, can be accommodated.

Disadvantages

- Potential property impacts;
- Potential impacts to the natural environment;
- High cost;
- Large cuts north of the highway.

Recommendation

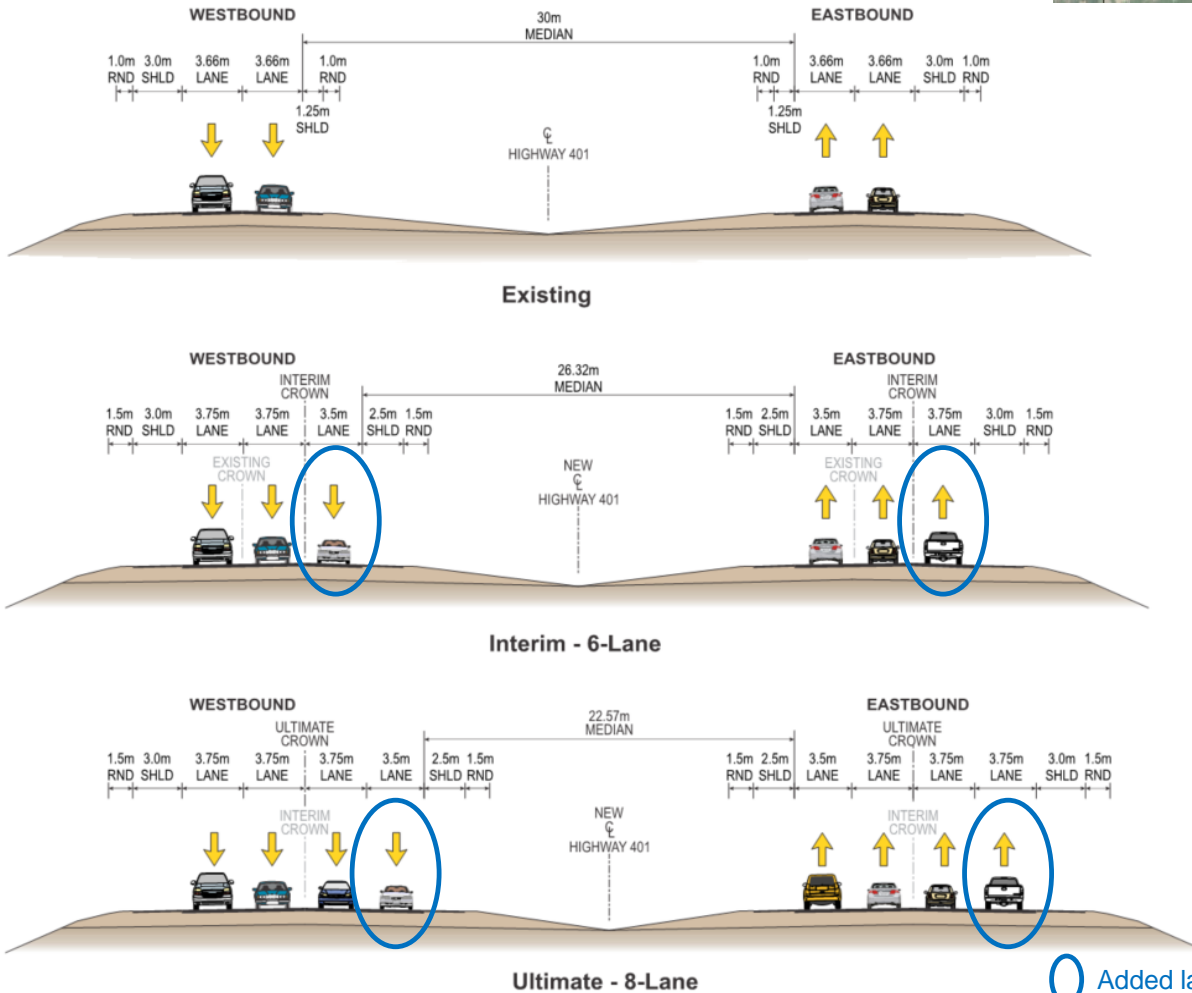
Carry forward
 for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

Section 7 – From 1.1 km east of County Road 26 to east study limit



Section 7 – Alternative 3 (of 5) Widen to the south

- Advantages**
- Open median is retained in the Ultimate condition;
 - Emergency median turnarounds, including the one existing turnaround, can be accommodated;
 - Minimizes large cuts north of the highway.

- Disadvantages**
- Potential property impacts;
 - Potential impacts to the natural environment;
 - High cost.

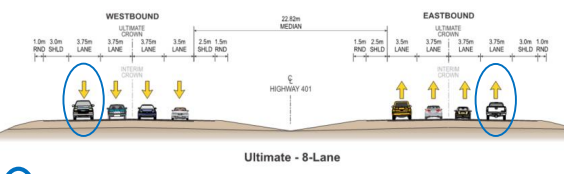
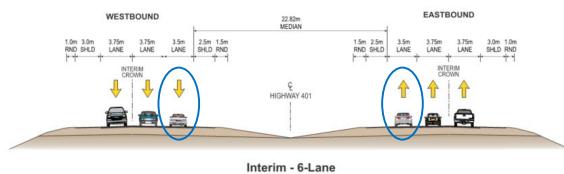
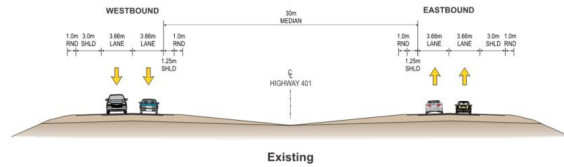
Recommendation
 Do not carry forward



Long List of Alternatives

Highway 401 Future Widening Alternatives

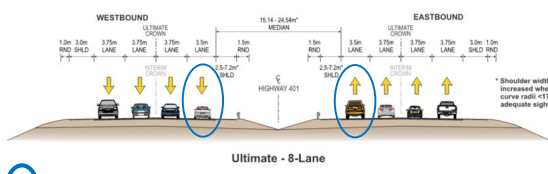
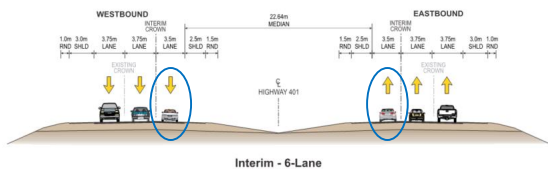
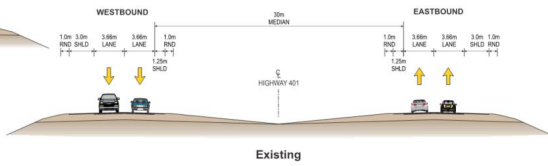
Section 7 – From 1.1 km east of County Road 26 to east study limit



○ Added lanes

Alternative 2 (west end)

Alternative 1 (east end)



○ Added lanes

Length of double median barrier may range from 0.7 to 1.7 km (to confirm in preliminary design)

Section 7 – Alternative 4 (of 5) Hybrid of Alternative 2 + Alternative 1

Advantages

- Emergency median turnarounds, including the one existing turnaround, can be accommodated;
- Minimizes large cuts north of the highway.

Disadvantages

- Potential property impacts (less than Alternative 2);
- Potential impacts to the natural environment (less than Alternative 2);
- For part of the section, double median barriers required in the Ultimate condition;
- Moderate cost.

Recommendation

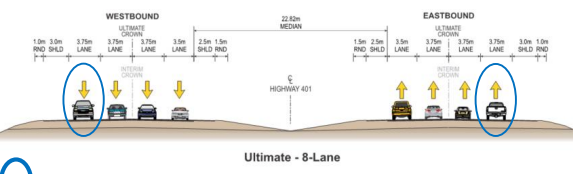
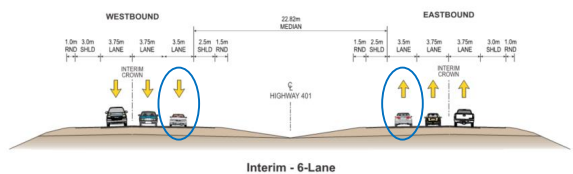
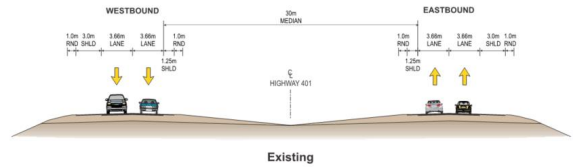
Carry forward for further study



Long List of Alternatives

Highway 401 Future Widening Alternatives

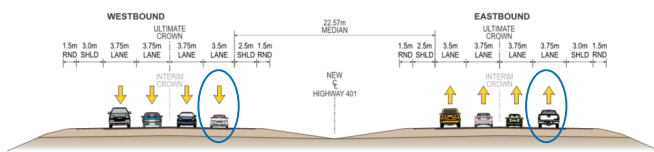
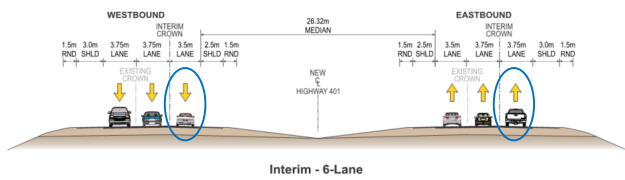
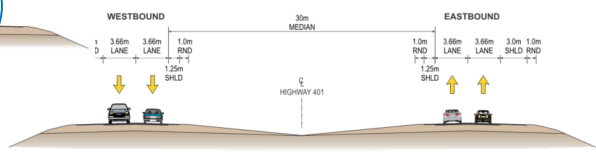
Section 7 – From 1.1 km east of County Road 26 to east study limit



○ Added lanes

Alternative 2 (west end)

Alternative 3 (east end)



○ Added lanes

Section 7 – Alternative 5 (of 5)
Hybrid of Alternative 2 + Alternative 3

Advantages

- Open median is retained in the Ultimate condition;
- Emergency median turnarounds, including the two existing turnarounds, can be accommodated;
- Minimizes large cuts north of the highway.

Disadvantages

- Potential property impacts;
- Potential impacts to the natural environment (less than Alternative 3);
- Moderate cost.

Recommendation

Carry forward for further study





Alternatives to be Carried Forward to the Short-list of Alternatives

Highway 401 Future Widening Alternatives



Section 1 From west study limit to 1.6 km west of Lake Road	
Alternative 1	Alternative 2
Widen inside only	Widen inside in the Interim and widen outside in the Ultimate
Do not carry forward	Carry forward as the preferred alternative

Section 2 From 1.6 km west of Lake Road to 0.4 km west of Lake Road		
Alternative 1	Alternative 2	Alternative 3
Widen inside only	Widen inside in the Interim and widen outside in the Ultimate	Widen to the north
Carry forward	Carry forward	Carry forward

Section 3 From 0.4 km west of Lake Road to 1.3 km east of Lake Road		
Alternative 1	Alternative 2A	Alternative 2B
Widen outside only and widen median shoulders	Widen outside only and realign using two 1200 m radius curves	Widen outside only and realign using two 1700 m radius curves
Carry forward	Carry forward	Carry forward



Alternatives to be Carried Forward to the Short-list of Alternatives

Highway 401 Future Widening Alternatives



Section 4 From 1.3 km east of Lake Road to 2.8 km east of Lake Road	
Alternative 1	
Widen outside only	
Carry forward as the preferred alternative	

Section 5 From 2.8 km east of Lake Road to County Road 30 west study limit			
Alternative 1	Alternative 2	Alternative 3	Alternative 4
Widen inside only	Widen inside in the Interim, and widen WB inside and EB outside in the Ultimate	Widen to the south	Widen inside in the Interim and widen outside in the Ultimate
Do not carry forward	Do not carry forward	Carry forward	Carry forward



Alternatives to be Carried Forward to the Short-list of Alternatives

Highway 401 Future Widening Alternatives

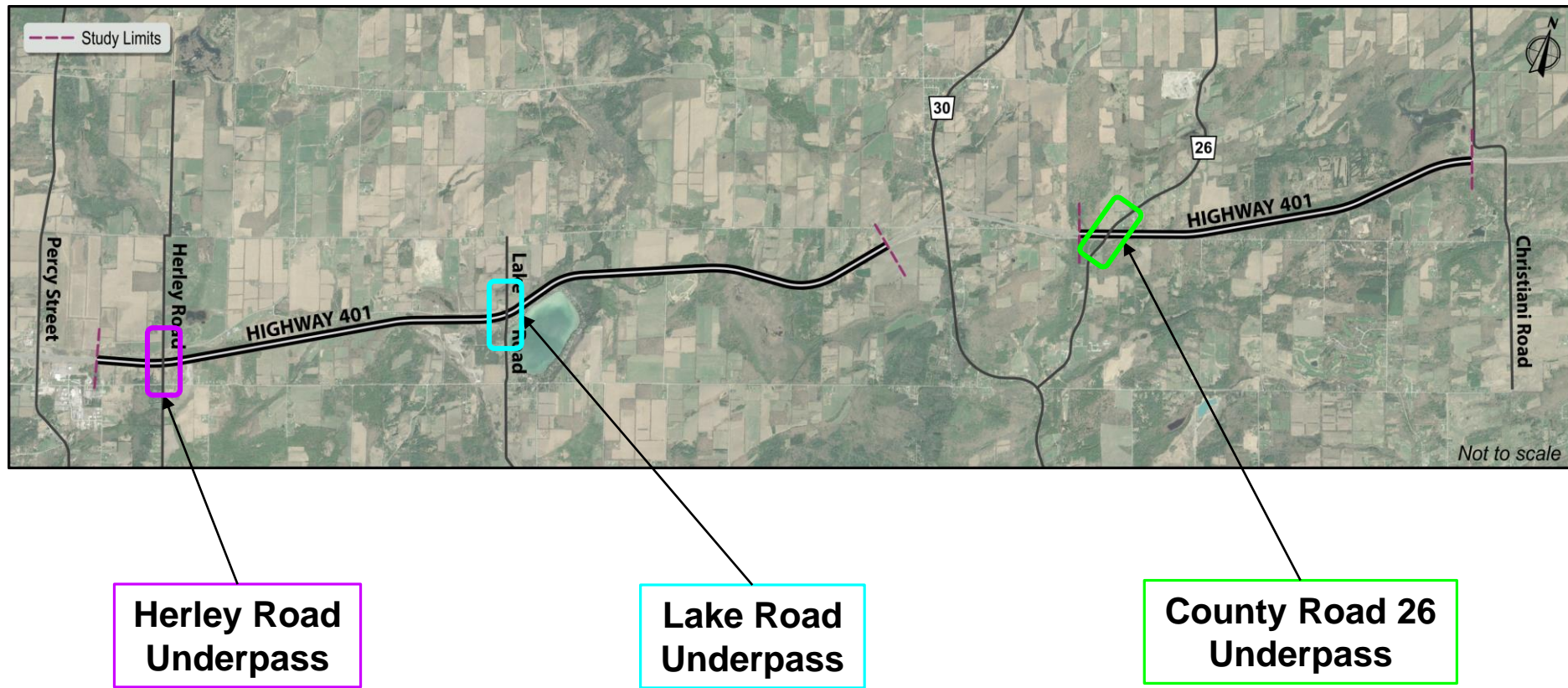


Section 6 From County Road 30 east study limit to 1.1 km east of County Road 26	
Alternative 1	
Widen outside only	
Carry forward as the preferred alternative	

Section 7 From 1.1 km east of County Road 26 to east study limit				
Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Widen inside only	Widen inside in the Interim and widen outside in the Ultimate	Widen to the south	Hybrid of Alternative 2 + Alternative 1	Hybrid of Alternative 2 + Alternative 3
Do not carry forward	Carry forward	Do not carry forward	Carry forward	Carry forward

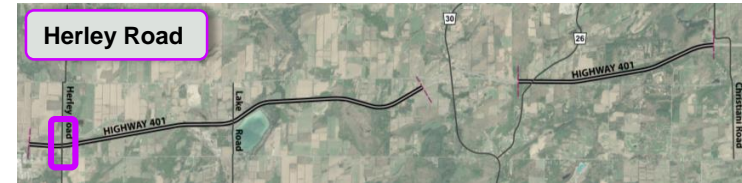
Long List of Alternatives

Bridge Replacement Alternatives



Long List of Alternatives

Bridge Replacement Alternatives



Herley Road – Alternative 1 (of 4)

Replace bridge to the west

Advantages

- Herley Road remains open during construction.

Disadvantages

- Potential property impacts;
- Access impact on the southwest side;
- Potential environmental impacts;
- Less desirable crossing road geometry;
- Requires realignment of Honey Road at the Herley Road intersection to tie in;
- Higher cost than Alternatives 3 and 4;
- Realignment increases construction and staging complexity and construction duration.

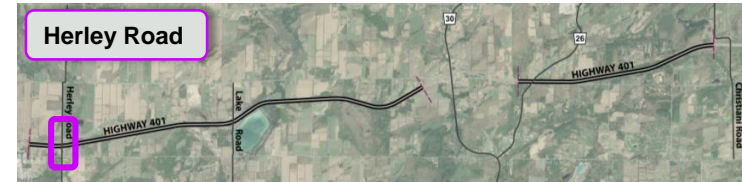
Recommendation

Carry forward for further study



Long List of Alternatives

Bridge Replacement Alternatives



Herley Road – Alternative 2 (of 4) Replace bridge to the east

Advantages

- Herley Road remains open during construction;
- Existing Honey Road alignment can be maintained to tie into Herley Road.

Disadvantages

- Potential property impacts;
- Potential environmental impacts;
- Less desirable crossing road geometry;
- Higher cost than Alternatives 3 and 4;
- Realignment increases construction and staging complexity and construction duration.

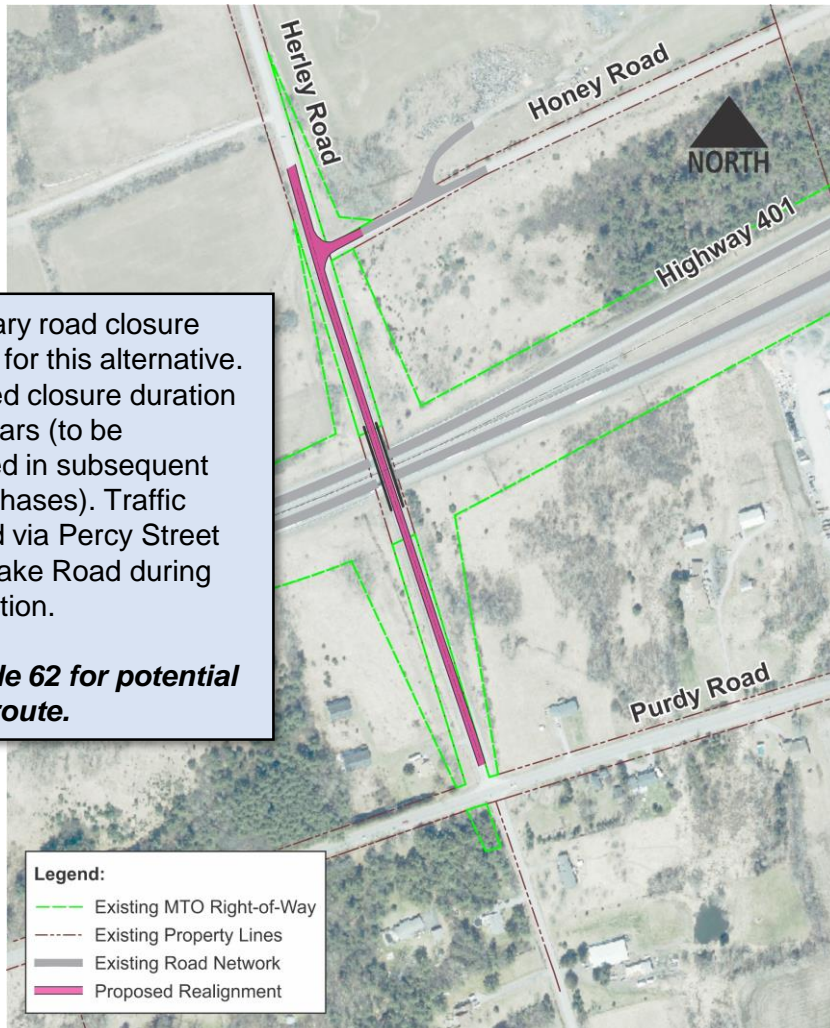
Recommendation

Carry forward for further study



Long List of Alternatives

Bridge Replacement Alternatives



Temporary road closure required for this alternative. Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases). Traffic detoured via Percy Street and/or Lake Road during construction.

See Slide 62 for potential detour route.

- Legend:
- Existing MTO Right-of-Way
 - Existing Property Lines
 - Existing Road Network
 - Proposed Realignment

Herley Road – Alternative 3 (of 4) Replace bridge on existing alignment (temporary road closure)

Advantages

- Minimizes property impacts;
- Minimizes potential environmental impacts;
- More desirable crossing road geometry;
- Existing Honey Road alignment can be maintained to tie into Herley Road;
- Moderate cost (lower cost than Alternative 1 and 2);
- Replacing on the same alignment facilitates construction and staging complexity and reduces construction duration.

Disadvantages

- Herley Road closure during construction results in temporary out-of-way travel during construction.

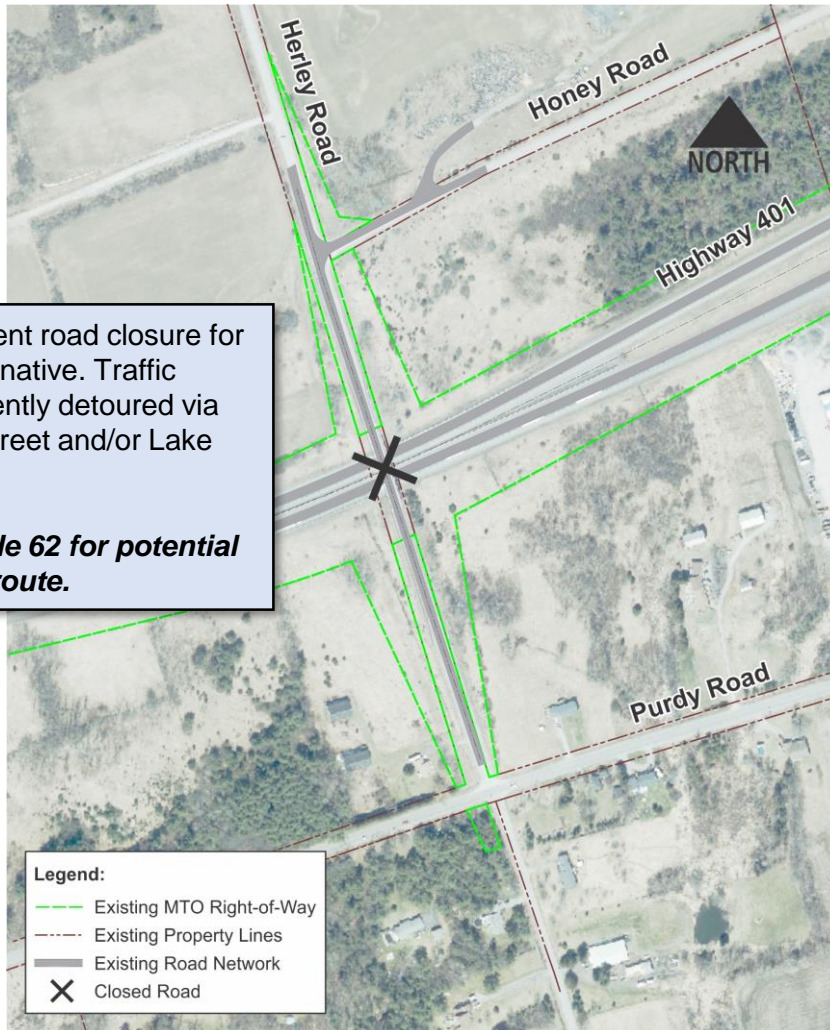
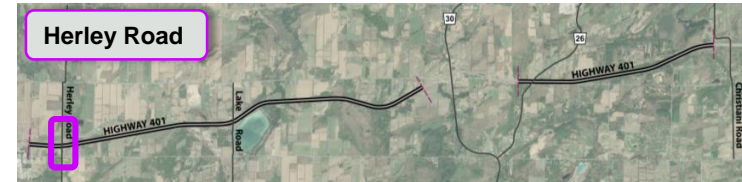
Recommendation

Carry forward for further study



Long List of Alternatives

Bridge Replacement Alternatives



Permanent road closure for this alternative. Traffic permanently detoured via Percy Street and/or Lake Road.

See Slide 62 for potential detour route.

Herley Road – Alternative 4 (of 4) Permanently remove crossing

Advantages

- Minimizes property impacts;
- Minimizes potential environmental impacts;
- Lowest cost;
- Simplifies construction and staging by eliminating new bridge construction.

Disadvantages

- Out-of-way travel to cross Highway 401 due to permanent road closure;
- Out-of-way travel to access Township of Cramahé water storage tank northwest of Highway 401 and Herley Road.

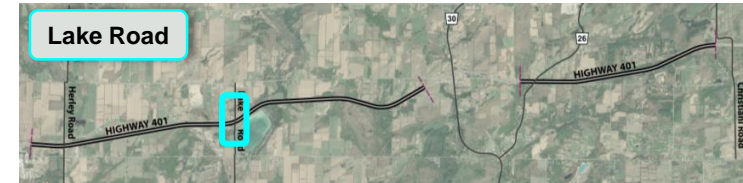
Recommendation

Do not carry forward



Long List of Alternatives

Bridge Replacement Alternatives



Lake Road – Alternative 1 (of 3)

Replace bridge to the west

Advantages

- Lake Road remains open during construction;
- Improves geometry of the McDonald Road and Lake Road intersection as compared to existing.

Disadvantages

- Property impacts west of Lake Road;
- Potential impacts to the natural environment;
- Less desirable crossing road geometry;
- Lower compatibility with Highway 401 widening alternatives;
- Worse geometry at the Crandall Road and Lake Road intersection.

Recommendation

Do not carry forward



Long List of Alternatives

Bridge Replacement Alternatives



Lake Road – Alternative 2 (of 3)

Replace bridge to the east

Advantages

- Lake Road remains open during construction.

Disadvantages

- Property impacts east of Lake Road;
- Potential impacts to the natural environment;
- Less desirable crossing road geometry;
- Lower compatibility with Highway 401 widening alternatives;
- Worse geometry of the McDonald Road and Lake Road intersection as compared to existing;
- Requires extension of Crandall Road at Lake Road to tie in.

Recommendation

Do not carry forward

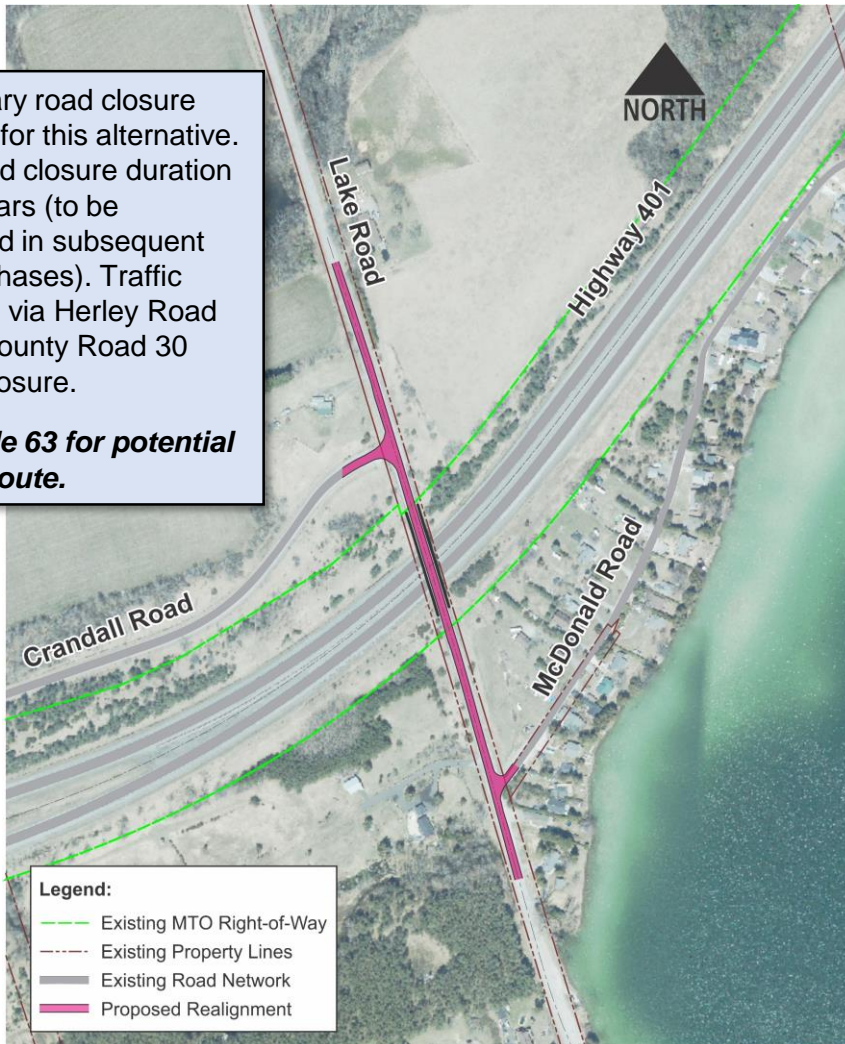


Long List of Alternatives

Bridge Replacement Alternatives

Temporary road closure required for this alternative. Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases). Traffic detoured via Herley Road and/or County Road 30 during closure.

See Slide 63 for potential detour route.



Lake Road – Alternative 3 (of 3)

Replace bridge on existing alignment

Advantages

- Minimizes property impacts;
- Minimizes potential impacts to the natural environment;
- More desirable crossing road geometry;
- Higher compatibility with Highway 401 widening alternatives;
- Maintains existing geometry at the Crandall Road and Lake Road intersection. May require regrading to tie in.

Disadvantages

- Lake Road closure during construction;
- Maintains existing geometry of the McDonald Road and Lake Road intersection.

Recommendation

Carry forward as the preferred alternative



Long List of Alternatives

Bridge Replacement Alternatives



County Road 26 – Alternative 1 (of 7) Replace bridge to the far west

Advantages

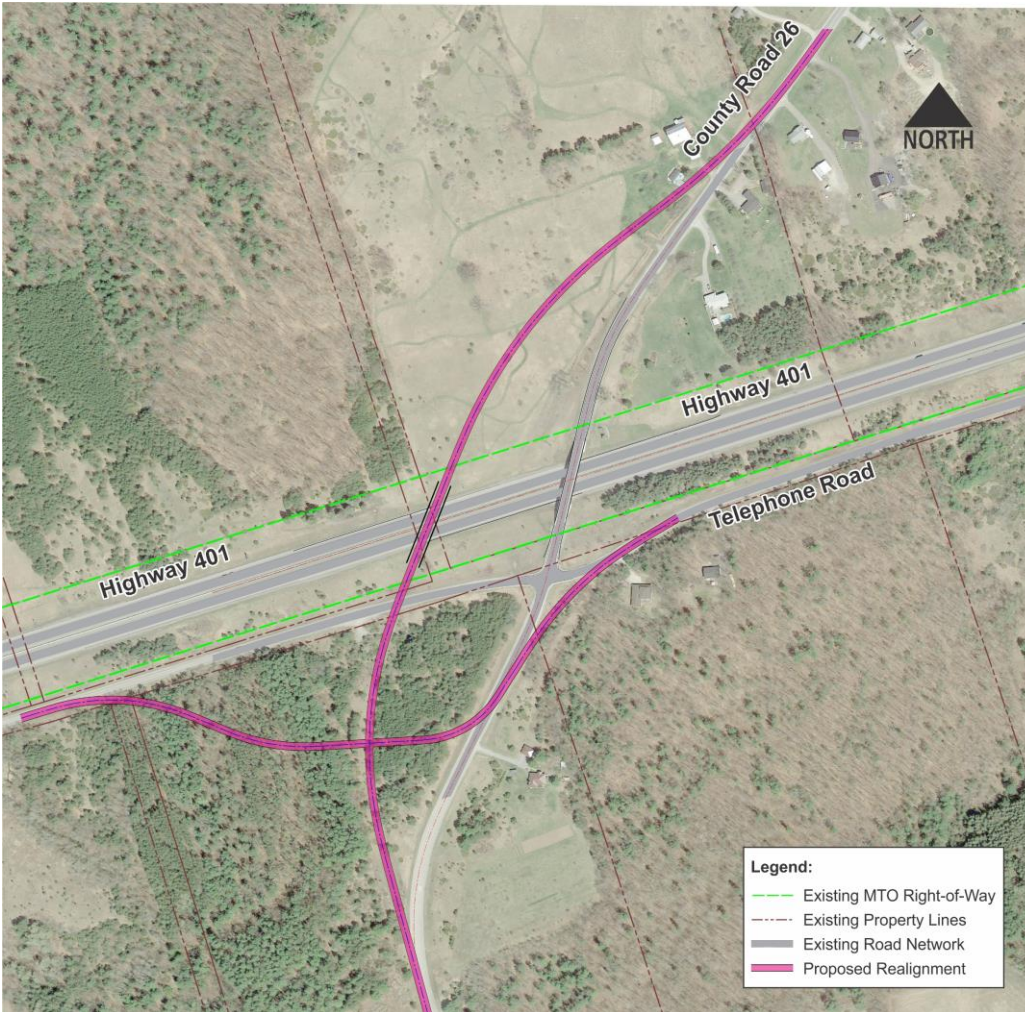
- County Road 26 remains open during construction;
- Property impacts due to Telephone Road realignment are relatively small (less than Alternatives 3, 4, and 5);
- Realignment of Telephone Road through natural area is relatively small;
- Existing horizontal curves are improved.

Disadvantages

- Property impacts due to County Road 26 realignment are smaller than significant on the northwest side;
- Relatively high cost (similar to Alternatives 2 and 3).

Recommendation

Do not carry forward



Long List of Alternatives

Bridge Replacement Alternatives



County Road 26 – Alternative 2 (of 7) Replace bridge to the west (intermediate)

Advantages

- County Road 26 remains open during construction;
- Property impacts due to Telephone Road realignment are relatively small (less than Alternatives 3, 4, and 5);
- Realignment of Telephone Road through natural area is relatively small;
- Existing horizontal curves are improved.

Disadvantages

- Property impacts due to County Road 26 realignment are large on the northwest side (less than Alternative 1);
- Relatively high cost (similar to Alternatives 1 and 3).

Recommendation

Carry forward for further study



Long List of Alternatives

Bridge Replacement Alternatives



County Road 26 – Alternative 3 (of 7) Replace bridge to the west (curved structure)

Advantages

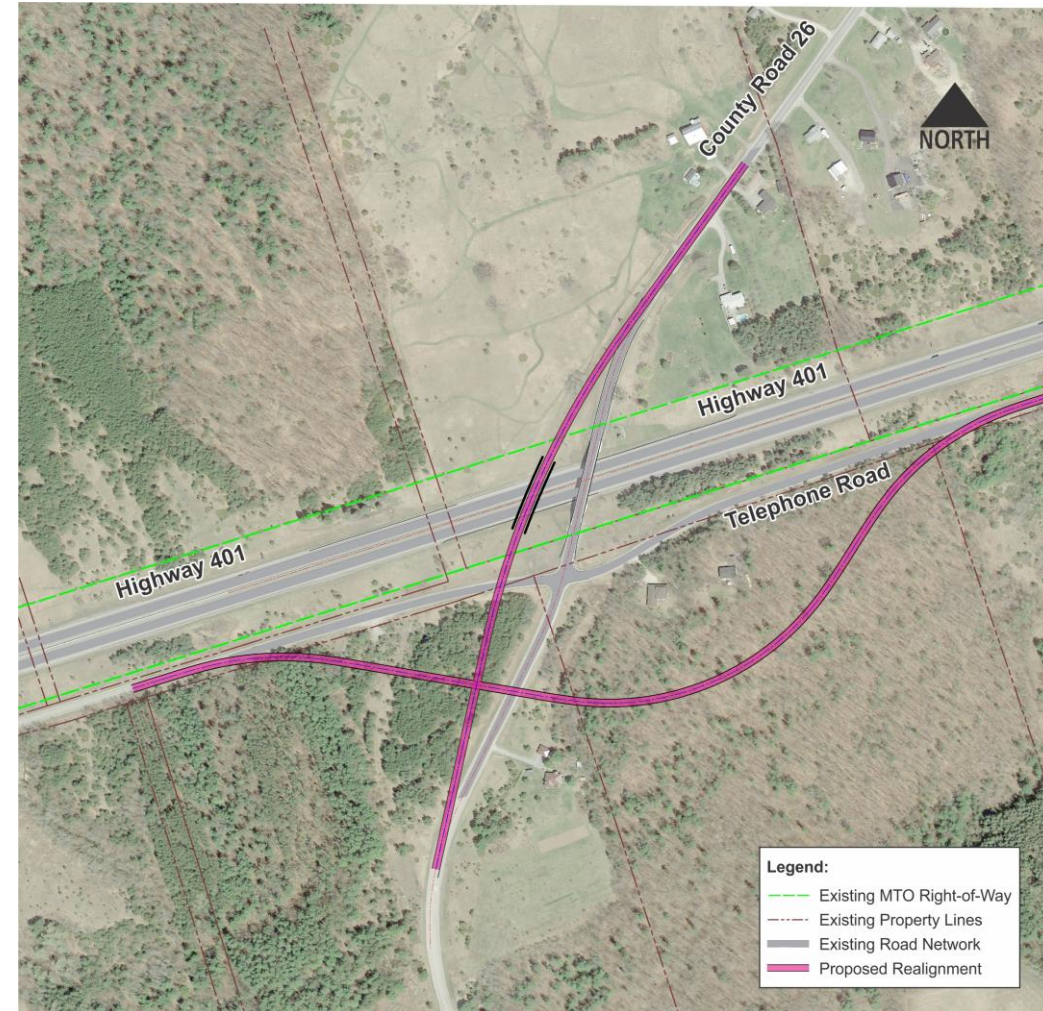
- County Road 26 remains open during construction;
- Property impacts due to County Road 26 realignment are relatively small;
- Existing horizontal curves are improved.

Disadvantages

- Property impacts due to Telephone Road realignment are relatively large (greater than Alternatives 1 and 2);
- Significant realignment of Telephone Road through natural area;
- Relatively high cost (similar to Alternatives 1 and 2);
- Curved structure increases complexity of design and construction.

Recommendation

Do not carry forward



Long List of Alternatives

Bridge Replacement Alternatives



County Road 26 – Alternative 4 (of 7) Replace bridge to the west (straight structure)

Advantages

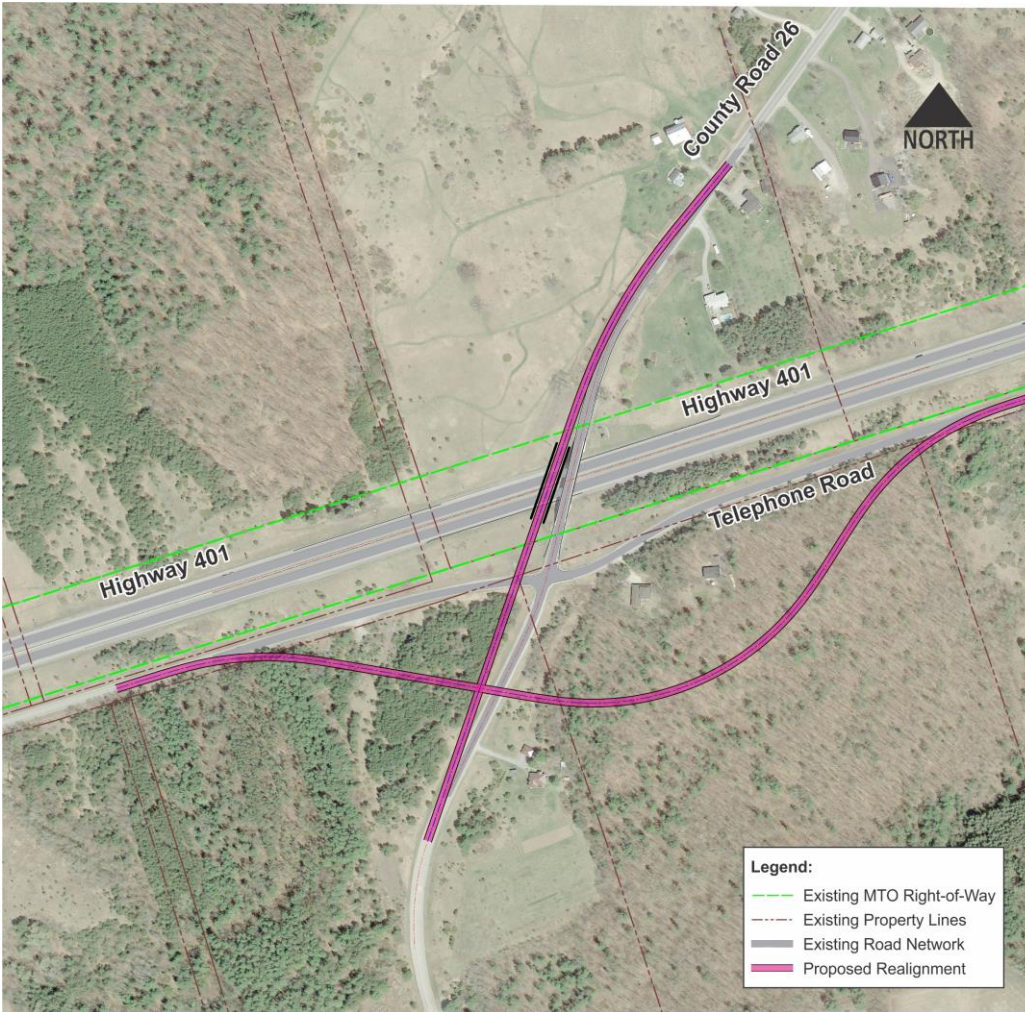
- County Road 26 remains open during construction;
- Property impacts due to County Road 26 realignment are relatively small;
- Existing horizontal curves are improved.

Disadvantages

- Property impacts due to Telephone Road realignment are relatively large (greater than Alternatives 1 and 2);
- Significant realignment of Telephone Road through natural area;
- Moderate cost (less than Alternatives 1, 2, and 3 and greater than Alternatives 6 and 7).

Recommendation

Do not carry forward



Long List of Alternatives

Bridge Replacement Alternatives



County Road 26 – Alternative 5 (of 7)

Replace bridge to the east

Advantages

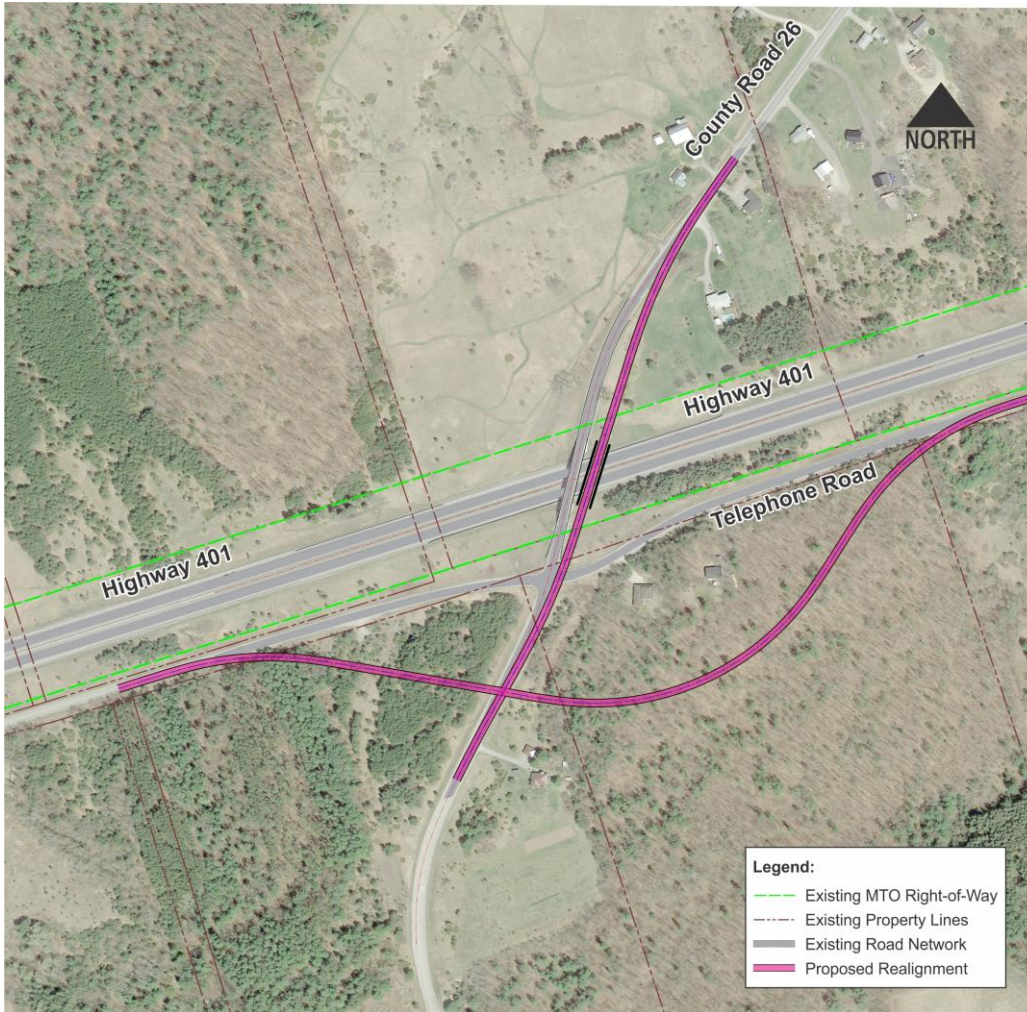
- County Road 26 remains open during construction;
- Property impacts due to County Road 26 realignment are relatively small;
- Existing horizontal curves are improved.

Disadvantages

- Property impacts due to Telephone Road realignment are relatively large (greater than Alternatives 1 and 2);
- Significant realignment of Telephone Road through natural area;
- Moderate cost (less than Alternatives 1, 2, and 3 and greater than Alternatives 6 and 7).

Recommendation

Do not carry forward

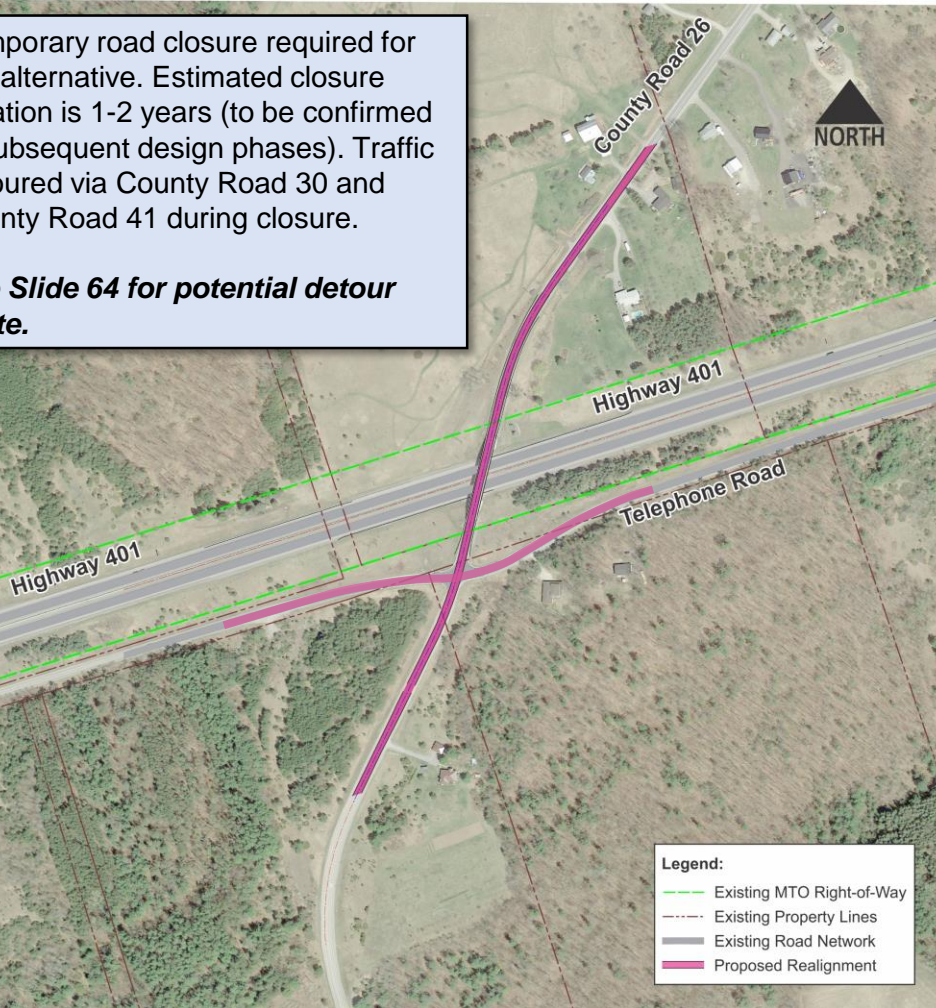


Long List of Alternatives

Bridge Replacement Alternatives

Temporary road closure required for this alternative. Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases). Traffic detoured via County Road 30 and County Road 41 during closure.

See Slide 64 for potential detour route.



County Road 26 – Alternative 6 (of 7)

Replace bridge on existing alignment (temporary road closure)

Advantages

- Property impacts due to County Road 26 realignment are minimized;
- Existing Telephone Road alignment is maintained, with modification and/or regrading potentially required to tie in to the intersection;
- Minimizes potential environmental impacts;
- Lowest cost.

Disadvantages

- County Road 26 closure during construction eliminates a key arterial road and access to local facilities;
- Maintains existing horizontal curvature.

Recommendation

Carry forward for further study



Long List of Alternatives

Structure Replacement Alternatives



County Road 26 – Alternative 7 (of 7) Replace structure on existing alignment (temporary single-lane traffic control)

Advantages

- County Road 26 remains open during construction with single-lane, traffic-signal controlled operations;
- Property impacts due to County Road 26 realignment are minimized;
- Existing Telephone Road alignment is maintained, with modification and/or regrading potentially required to tie in to the intersection;
- Minimizes potential environmental impacts;
- Higher than Alternative 6 but lower than all other alternatives.

Disadvantages

- Maintains existing horizontal curvature.

Recommendation

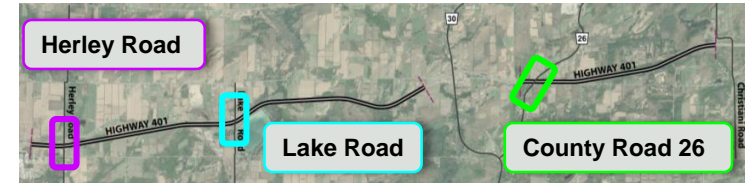
Carry forward for further study





Alternatives to be Carried Forward to the Short-list of Alternatives

Bridge Replacement Alternatives



Herley Road			
Alternative 1	Alternative 2	Alternative 3	Alternative 4
Replace to the west	Replace to the east	Replace on existing alignment	Permanent remove crossing
Carry forward	Carry forward	Carry forward	Do not carry forward

Lake Road		
Alternative 1	Alternative 2	Alternative 3
Replace to the west	Replace to the east	Replace on existing alignment
Do not carry forward	Do not carry forward	Carry forward

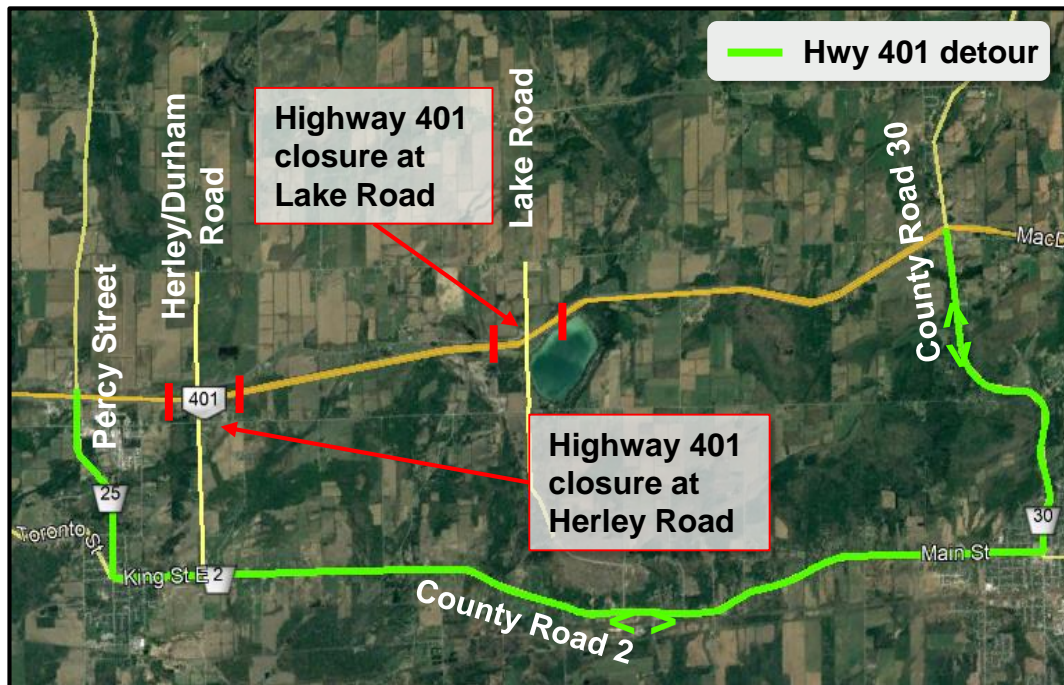
County Road 26						
Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Replace to the far west	Replace to the west (intermediate)	Replace to the west (curved bridge)	Replace to the west (straight bridge)	Replace to the east	Replace on existing alignment (temporary road closure)	Replace on existing alignment (temporary single-lane traffic control)
Do not carry forward	Carry forward	Do not carry forward	Do not carry forward	Do not carry forward	Carry forward	Carry forward

Detours for Bridge Demolition and Construction

Herley Road and Lake Road Underpasses

Detour Highway 401 traffic onto Emergency Detour Route (EDR) for bridge demolition and girder placement of new bridges

- Due to the bridge type, each structure must be demolished all at once.
- Not feasible to detour within the highway right-of-way, so traffic must be detoured onto EDR.



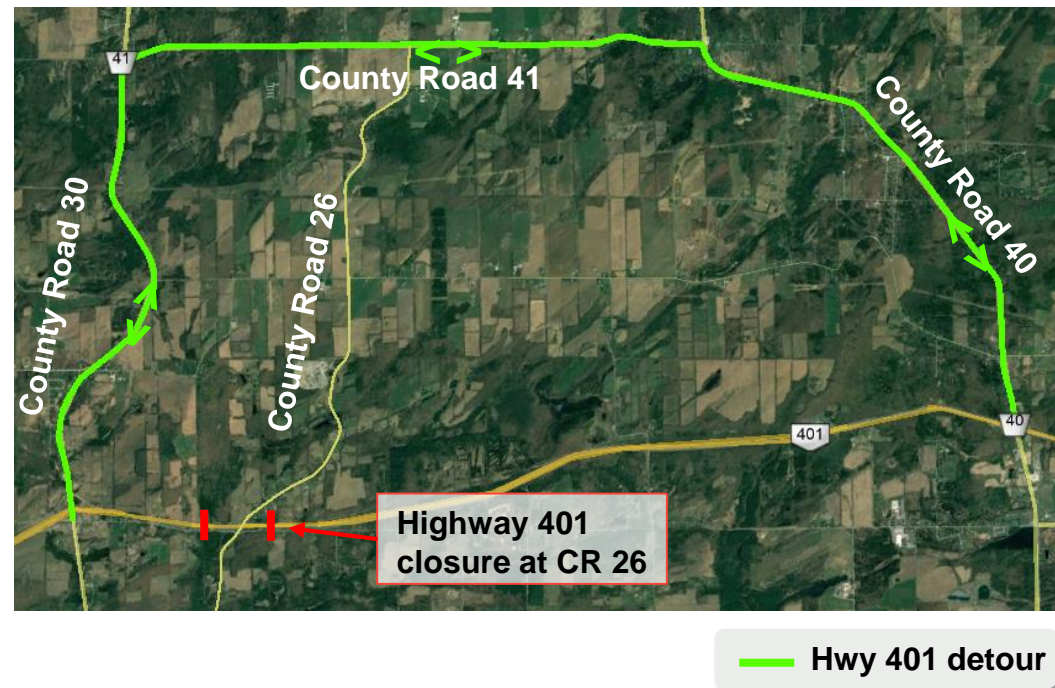
- Estimated 12-18 hour off-peak closure of Highway 401.
- Police-assisted traffic control.
- Herley Road and Lake Road bridge demolitions will not occur at the same time.
- Timing of the bridge replacements and the number/duration of overnight closures will be confirmed during the Detail Design stage, the timing of which is currently unknown.

Detours for Bridge Demolition and Construction

County Road 26 Underpass

Detour Highway 401 traffic onto Emergency Detour Route (EDR) for bridge demolition and girder placement of new bridges

- It may not be feasible to detour within the highway right-of-way, so traffic must be detoured onto EDR.
- Estimated 12-18 hour off-peak closure of Highway 401.
- Police-assisted traffic control.
- Timing of the bridge replacement and the number/duration of overnight closures will be confirmed during the Detail Design stage (timing is currently unknown).

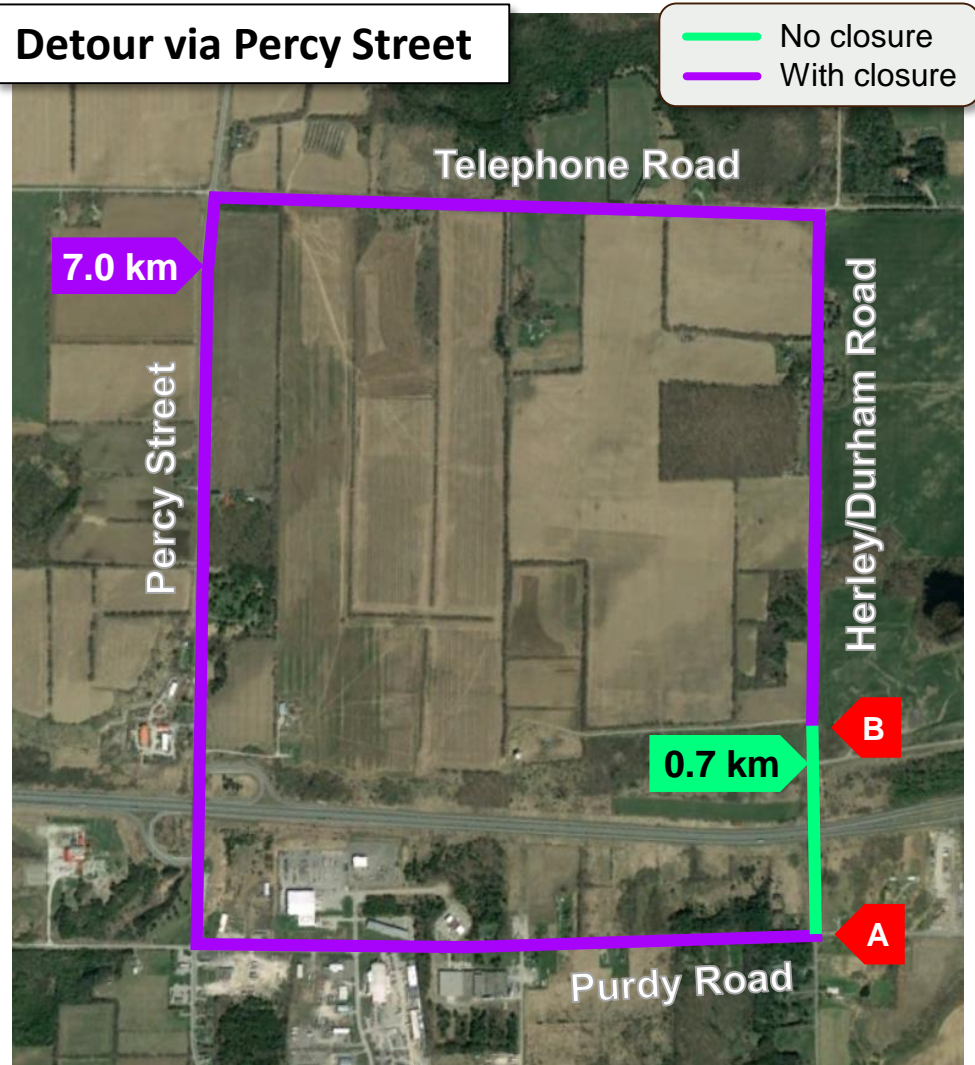


Detours for Potential Crossing Road Closures

Herley/Durham Road

- Temporary road closure may be required for structure replacement.
- Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases).
- Detour via Percy Street and/or Lake Road during construction. To cross Highway 401 (from Point A to Point B):
 - Detour via Percy Street: additional 6.3 km (approximately 6 min*).
 - Detour via Lake Road: additional 9.7 km (approximately 10 min*).

Detour only required for Herley Road Bridge Replacement Alternative 3 (see Slide 47).



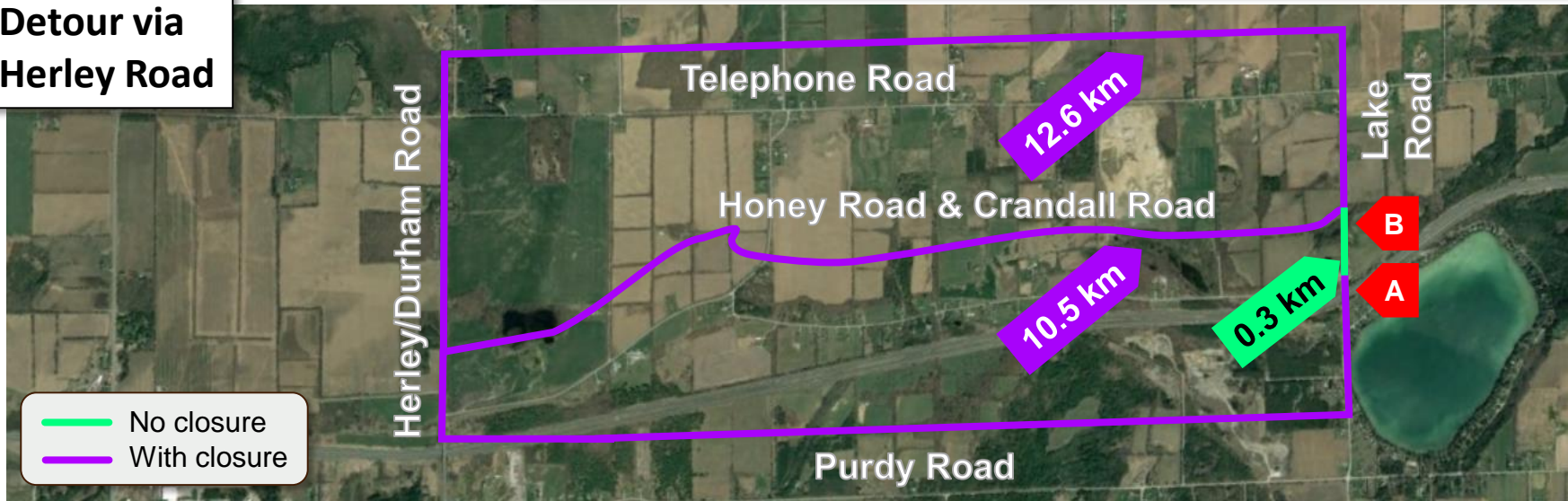
Detours for Potential Crossing Road Closures

Lake Road

- Temporary road closure may be required for structure replacement.
- Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases).
- Detour via Herley Road and/or County Road 30 during construction. To cross Highway 401 (from Point A to Point B):
 - Detour via Herley Road: additional 10.2 to 12.3 km (approximately 10 to 12 min*)
 - Detour via County Road 30: additional 16 km (approximately 16 min*)

Detour only required for Lake Road Bridge Replacement Alternative 3 (see Slide 51).

Detour via Herley Road

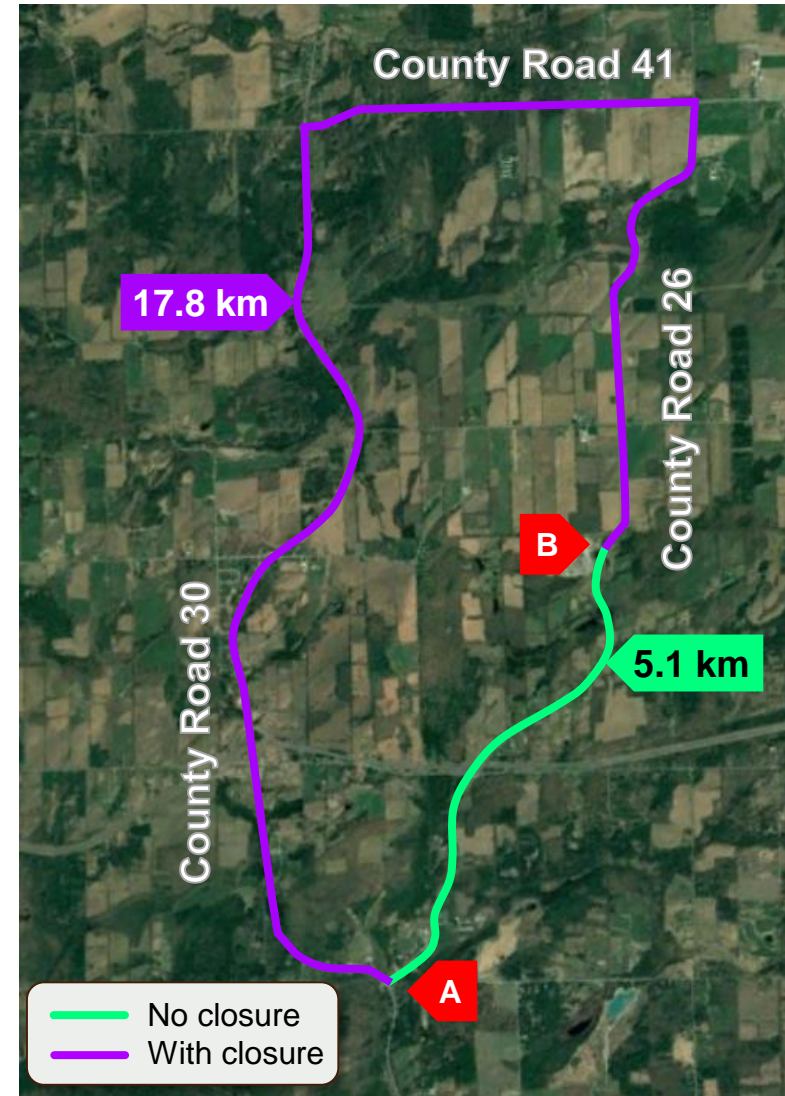


Detours for Potential Crossing Road Closures

County Road 26

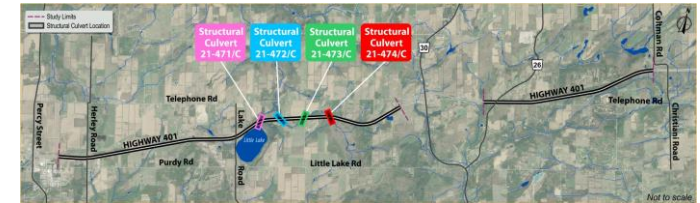
- Temporary road closure may be required for bridge replacement.
- Estimated closure duration is 1-2 years (to be confirmed in subsequent design phases).
- Detour via County Road 30 and County Road 41 during construction.
- Additional 12.7 km (approximately 13 min*) on detour route from south of Highway 401 (Point A) to north of Highway 401 (Point B at County landfill).

Detour only required for County Road 26 Bridge Replacement Alternative 6 (see Slide 57).



Culvert Replacements

- There are four structural culverts crossing Highway 401 between Lake Road and County Road 30.
- All culverts require replacement since they are approaching the end of their service life. New culverts will be compatible with future Highway 401 widening.
- Culvert sizes and staging details will be confirmed as the study progresses, however it is anticipated that all Highway 401 lanes will be maintained during the majority of construction.



Culvert 21-471C



Culvert 21-472C



Culvert 21-473C

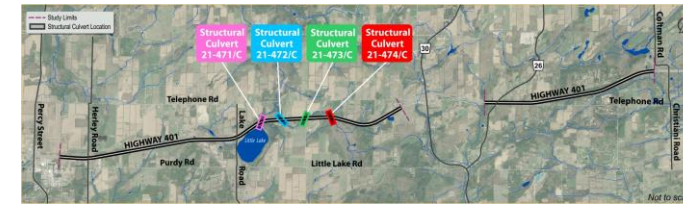


Culvert 21-474C





Culvert Replacement Alternatives




Alternative 1 – Replace with culvert (open cut)

- Advantages**
- Can maintain existing channel alignment;
 - Ideal for low fill locations.

- Disadvantages**
- Potential for long construction duration;
 - Staging challenges due to high traffic volumes;
 - Existing channel flows harder to maintain during construction.

Recommendation
 Carry forward for further study




Alternative 2 – Replace with culvert (trenchless method)

- Advantages**
- Can reduce construction staging impact on traffic;
 - Ideal for high fill locations;
 - Can easily maintain existing channel flows during construction.

- Disadvantages**
- Higher cost for larger culvert sizes;
 - Not ideal in poor ground conditions;
 - Requires channel realignment;
 - Potentially greater environmental impacts due to staging areas;
 - Not ideal for low fill locations (won't work for 2 of the 4 culverts).

Recommendation
 Carry forward for further study




Alternative 3 – Replace with bridge

- Advantages**
- Ideal for high fill locations;
 - Can maintain existing channel alignment;
 - Potentially less environmental impacts;
 - Can easily maintain existing channel flows during construction.

- Disadvantages**
- Higher cost;
 - Longer construction duration.

Recommendation
 Carry forward for further study



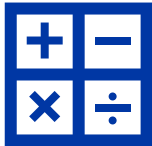
Evaluation Process



Identify Evaluation Criteria established through public input, similar projects, provincial guidelines, and existing conditions. Refer to the following slide.



Assign a Weight Factor to Each Criterion that best reflects its relative importance.



Evaluate alternatives by calculating the sum of the weighted scores providing a total score for each alternative. This is the basis for ranking the alternatives and identifying the recommended plan.



The **highest scoring alternative** will be selected as the preferred plan.

The selection of the preferred plan includes:

- Reviewing the results of the analysis and evaluation based on specialist work and input received during the study;
- Determining which criteria have the most influence on the outcome;
- Considering the sensitivity of the weightings;
- Confirming the ranking of the alternatives; and
- Considering public/stakeholder response to the evaluation process.

PIC #2 will present the evaluation of the alternatives and a preferred plan for this project.

Preliminary Evaluation Criteria



Natural Environment

Direct and indirect impacts to:

- Wetlands
- Fish and fish habitat
- Species at Risk (SAR) and SAR habitat
- Terrestrial ecosystems
- Groundwater / Surface Water
- Environmentally sensitive areas, including Brighton Bluff ANSI and Mayhew Creek and Spring Valley significant natural areas



Socio-Economic Environment

- Impacts to private properties
- Impacts to air quality
- Access for local residents, school buses and emergency vehicles
- Noise impacts at Noise Sensitive Receptors (NSRs)
- Impacts to existing and planned land uses
- Impacts to Recreational Trails / Active Transportation Networks
- Impacts to potentially contaminated lands
- Climate Change



Transportation / Technical Considerations

- Ability to accommodate future traffic performance forecasts on the Highway 401.
- Improvements to substandard geometrics and intersection design based on design standards for provincial highways.
- Cost, including utility relocations, property acquisition etc
- Constructability, including construction techniques and geotechnical and foundation conditions
- Traffic staging, including traffic flow and operations (such as local access and out-of-way travel during construction)
- Impacts to utilities



Cultural Heritage Environment

- Direct and indirect impacts to existing built heritage features and cultural heritage landscapes
- Impacts on archaeological resources and on areas of archaeological potential

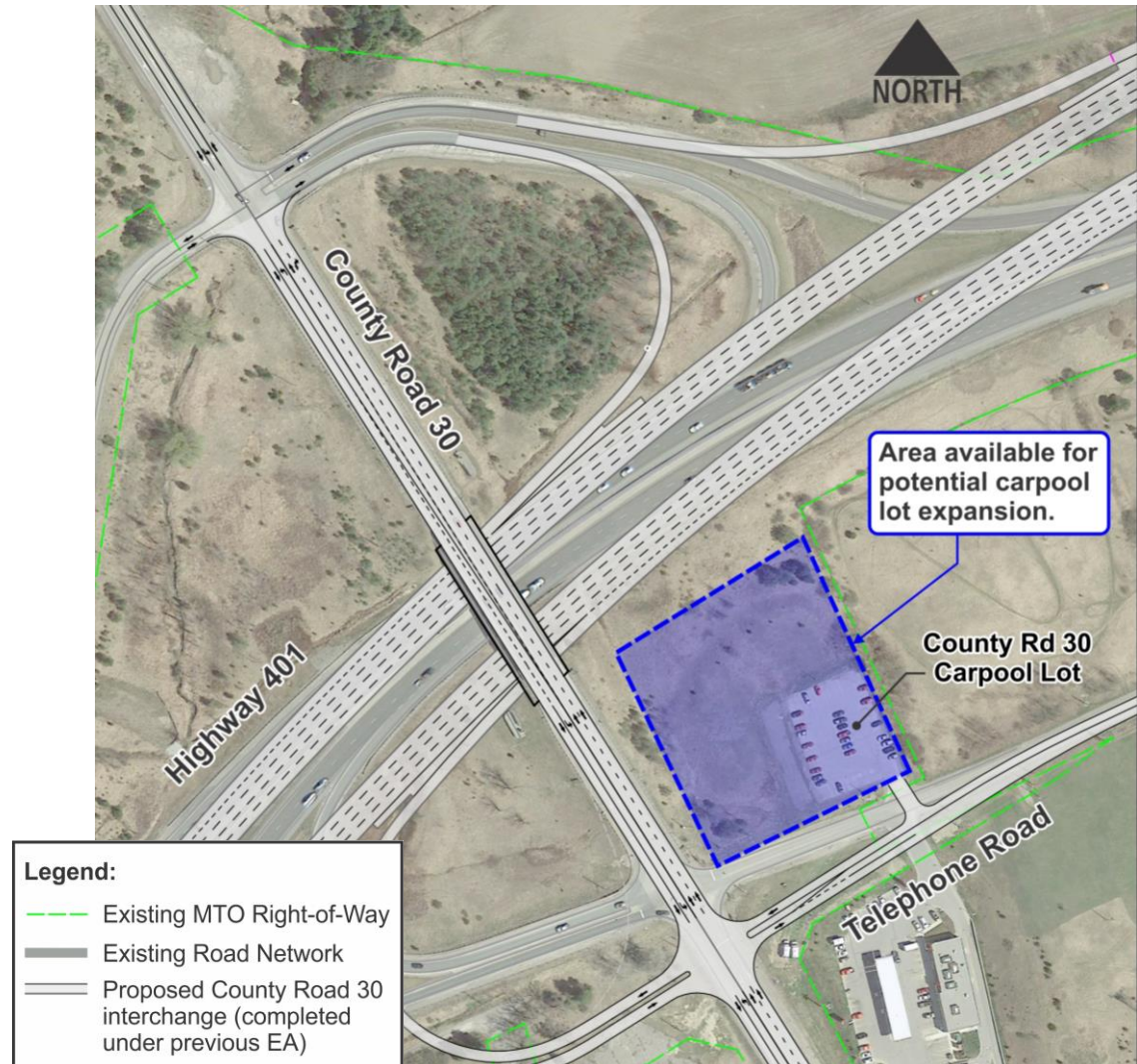
Anticipated Property Impacts



- There are some property impacts anticipated along the Highway 401 corridor due to the future widening.
- There is some potential for property impacts due to the crossing road bridge replacements and local road realignments/modifications.
- Property owners with likely impacts will be notified between Public Information Centre (PIC) #1, and PIC #2.
- Design and property requirements will be refined as the project progresses. Final property impacts will be presented in the Transportation Environmental Study Report (TESR) at the completion of the Environmental Assessment (EA).







Carpool Lot Improvements

- The existing carpool lot located at County Road 30 requires capacity expansion.
- This expansion will take place within existing MTO property.
- The lot may be expanded based on a phased approach over time.
- Further details (including the recommended size/shape) will be developed as the study progresses based on environmental and technical considerations.



Next Steps

After this Public Information Centre, the following will be carried out:

-  Review the comments received following PIC #1 and respond to comments;
-  Incorporate any refinements into the planning alternatives based on public and agency input;
-  Complete the analysis and evaluation of the planning alternatives and select a preferred plan; and,
-  Present and seek input on the preferred plan to MAC participants in MAC #2 in Summer 2021;
-  Notify anticipated impacted property owners and arrange meetings as necessary; and,
-  Hold PIC #2 in Fall 2021 to present and receive feedback on the results of the evaluation process and the preferred plan.



Contact Information

Please feel free to submit comments through the project website or by sending your comments to one of the Project Team members listed below. Comments would be appreciated by May 21, 2021.

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Thank you for your time and participation!
Information presented today is available online at the study website:
www.highway401colbornebrighton.ca

Freedom of Information and Protection of Privacy



Information collected during this study will be used to assist the Ministry of Transportation in meeting the requirements of the Ontario *Environmental Assessment Act*. This material will be maintained on file for use during the study and may be included in the study documentation.

Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.



Thank you for attending Public Information Centre #1