Welcome to Online Public Information Centre No. 2

Highway 401 at Power Dam Drive Interchange

Preliminary Design and Environmental Assessment Study

G.W.P. 4092-19-00

Ontario

May 30, 2024

Purpose of Public Information Centre No. 2

The purpose of this online Public Information Centre is to present and receive input on the Highway 401 at Power Dam Drive Interchange Improvements Preliminary Design and Environmental Assessment Study. This PIC will provide:

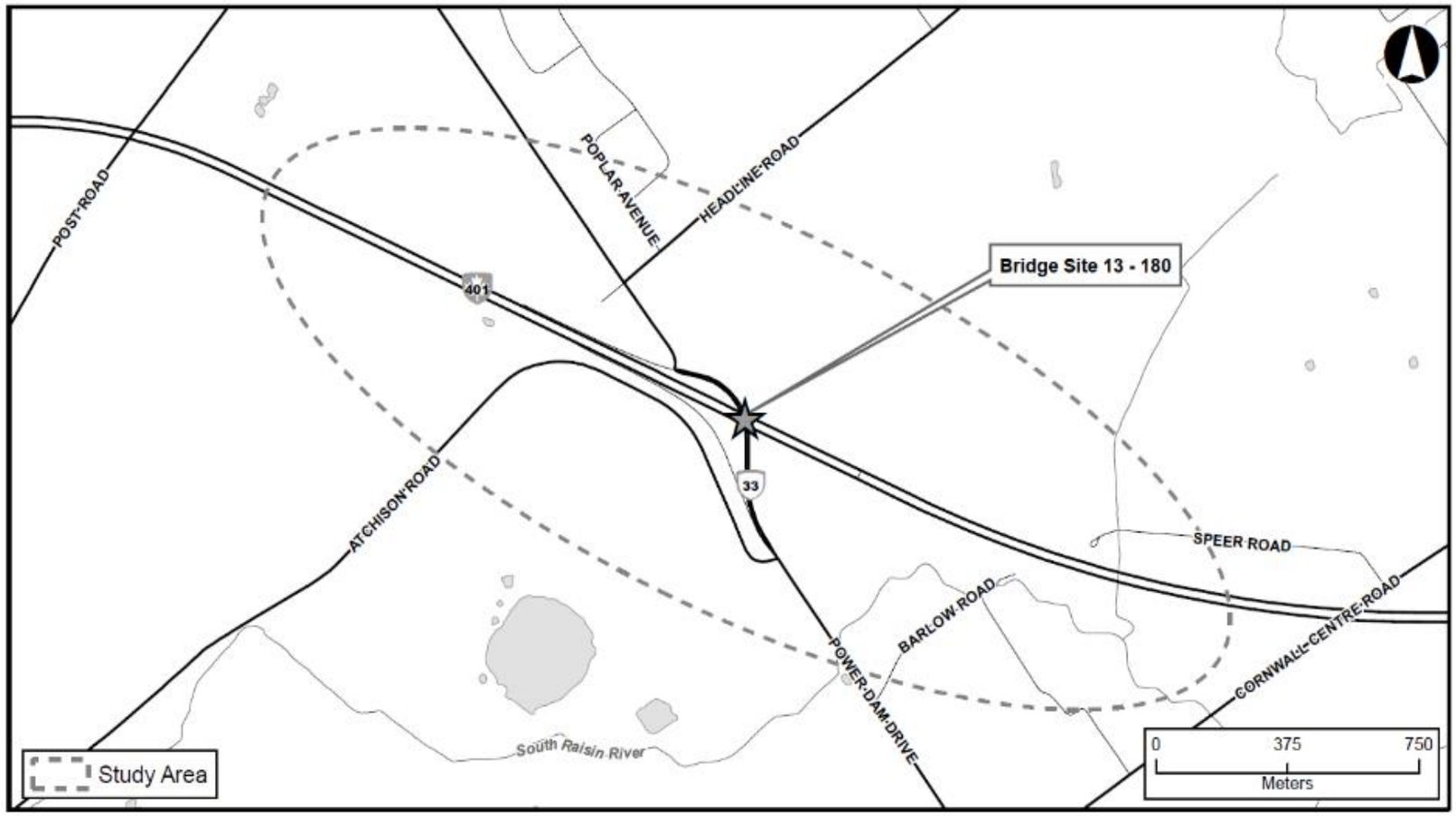
- A summary of PIC #1
- The results of the evaluation of the short-list of alternatives
- The recommended Technically Preferred Alternative
- An opportunity to provide feedback on the recommendation
- Next steps

Members of the Project Team are available to discuss any questions that you may have regarding this Project, please email Brad Hewton (Consultant Project Manager) at bhewton@morrisonhershfield.com.

If you require any assistance regarding the accessibility of these materials, please let us know by emailing the address above. We would be happy to assist you. Pour de l'aide en français, veuillez communiquer avec Brad Hewton.

Digital copies of the PIC display materials are posted to the project website at http://www.highway401powerdam.com.

Highway 401 at Power Dam Drive Study Area



The Project Study Area is located in the Township of South Stormont, within the United Counties of Stormont, Dundas and Glengarry.

Project Background

The Ministry of Transportation (MTO) conducts detailed inspections of its bridges every two years and conducts general maintenance inspections on all bridges at least twice a year. The Ministry ensures that its bridges and structures are well maintained, and repairs occur at the best time in the structure's life cycle.

Based on various studies and routine inspections, MTO rehabilitated the Power Dam Drive bridge in 2016 allowing for an anticipated replacement of the bridge in the near future.

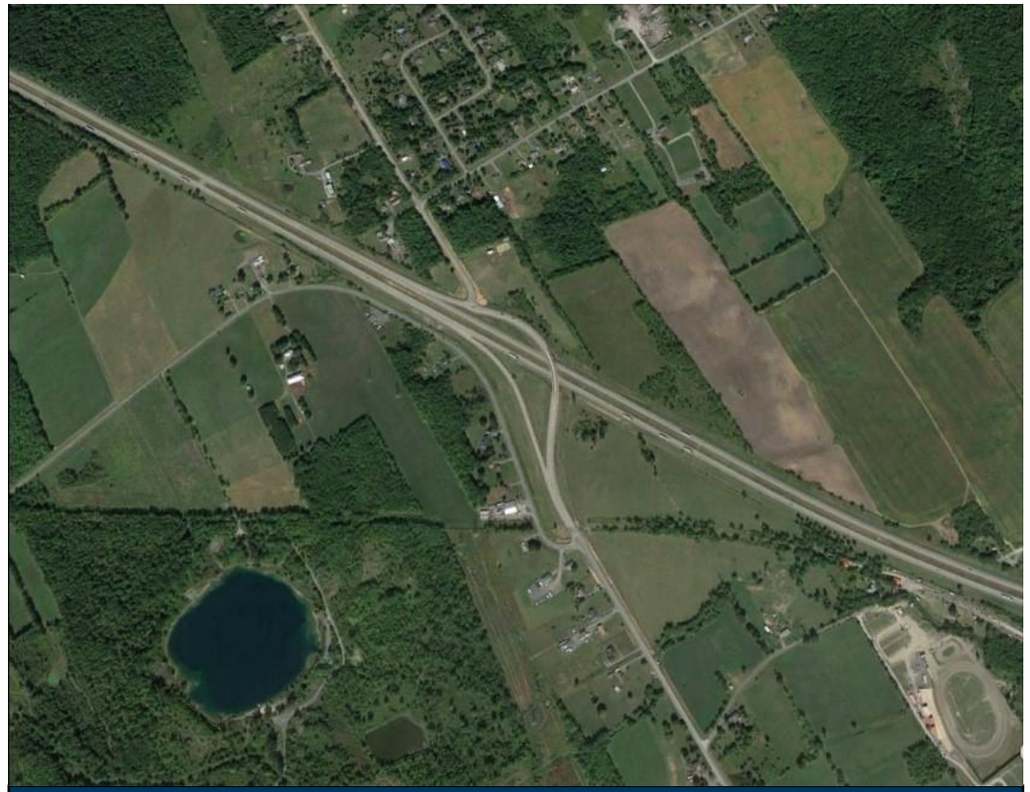
The ministry has retained Morrison Hershfield (now Stantec) to undertake the Preliminary Design and Environmental Assessment Study for the replacement and interchange improvement of the Power Dam Drive (or County Road 33) bridge over Highway 401 in the Township of South Stormont.

Project Overview

Challenge: Highway 401 is a four-lane divided rural freeway at the Power Dam Drive interchange. The existing Power Dam Drive bridge is approaching the end of service life and requires replacement. The interchange's current configuration does not allow for all traffic movements on to and off Highway 401.

Opportunity: Reasonable alternatives to improve roadway geometrics and incorporate future interchange options by replacing the current bridge and altering the Highway 401 footprint were developed and evaluated leading to the selection of the Technically Preferred Alternative and a Recommended Plan.

The Recommended Plan will address interim interchange improvements and accommodate long-term interchange and Highway 401 improvements should a future development require a full interchange. The bridge replacement and reconstruction of existing ramps will proceed as the first phase, with interchange upgrades to follow in the future.



Highway 401 at Power Dam Drive

Class EA Process

- This Preliminary Design and Class Environmental Assessment (Class EA) Study is following the Group B Project requirements under the MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000)
- Ongoing stakeholder consultation, including two rounds of Public Information Centres
- A Transportation Environmental Study Report (TESR) will be prepared and made available for public and agency review for a period of 30-days at Study completion
- For more information on the Class EA process, check out the PIC #1 presentation on our website: **http://www.highway401powerdam.com**

Class Environmental Assessment Process (2000)

The MTO Class Environmental Assessment Process was amended in 2023. As this project was initiated prior to the amendment being approved, this project continues to follow the MTO Class Environmental Assessment (2000) process which is described below:

PRELIMINARY DESIGN WITHIN THE ENVIRONMENTAL ASSESSMENT PROCESS

Data Collection

Review available background information and conduct field studies as required to identify existing conditions in the Study Area

Generate and Evaluate

Develop Preliminary Design alternatives to develop the long-term plan for the interchange and consider potential impacts to the existing natural, social, economic, cultural, and technical environment

Select

Identify the Recommended Plan. Identify mitigation measures to address potential impacts

Finalize

Complete Preliminary Design of the Recommended Plan and implementation strategy

Report

Document the Preliminary Design process leading to the Recommended Plan

Clearance

The Class EA requirements are met and the Project is cleared to proceed to Detail Design

Notifications and Project Website

Public Information Centres

Two PICs are being held for this project

Transportation Environmental Study Report

Available for a 30-day review

Existing Bridge (Site No. 13X-180/B0)

Description

- The Power Dam Drive bridge is a post-tensioned concrete curved structure that was built circa 1967
- The bridge is comprised of four (4) spans, with an overall length of 92.4m
- The existing bridge carries two (2) traffic lanes, and wide curbs with concrete barrier walls on each side over Highway 401

Condition

- Though the Power Dam Drive bridge is in fair condition overall, it is approaching the end of its intended service life
- The last rehabilitation was completed in 2016

Power Dam Drive Bridge

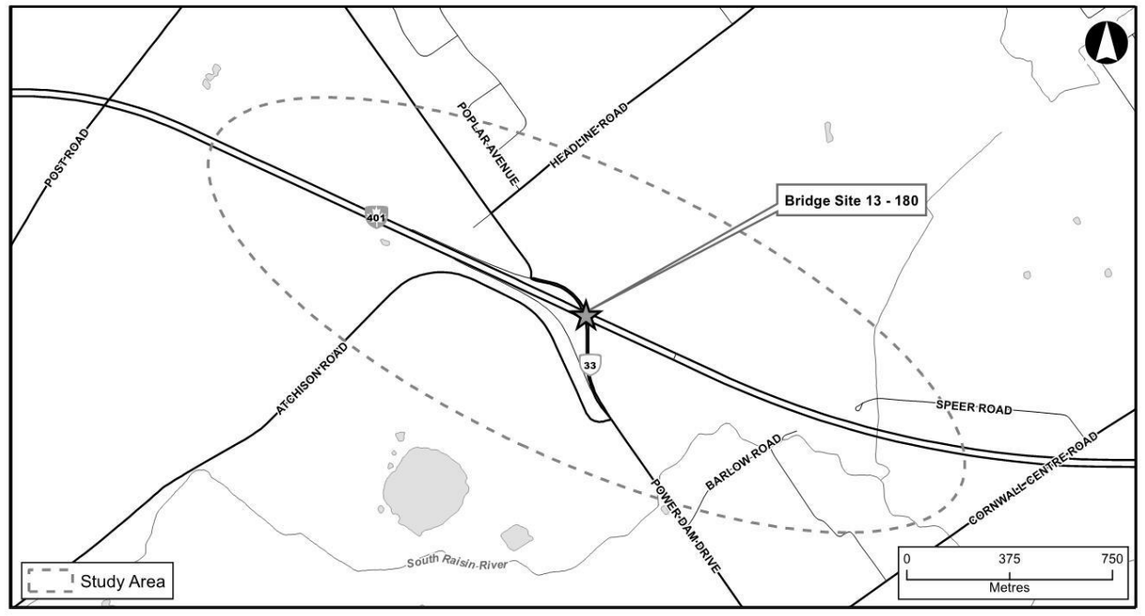
Existing Roadway Configuration

Highway 401

- Near the structure, Highway 401 has 2 lanes in each direction and includes a grassed median.
- Speed limit of 110 km/hr.
- Highway 401 serves an important corridor within eastern Ontario and Quebec
- There is currently one eastbound off-ramp and one westbound on-ramp

Power Dam Drive (County Road 33)

- Power Dam Drive (or County Road 33) is a two-lane municipal road which crosses Highway 401 in a north-south direction
- Speed limit of 80 km/hr.
- Nearby intersections include Atchison Road to the south and Headline Road to the north
- The current alignment does not meet the design standards for the design speed of the road.



Existing Road Map within the Power Dam Drive Study Area

Overview of Environmental Investigations

As part of this Preliminary Design and Class EA Study, a range of studies were undertaken to collect primary environmental and engineering information to:

- Confirm and document existing (baseline) natural, social, economic, cultural and technical conditions within the Study Area
- Confirm the anticipated (or predicted) impacts
- Develop applicable environmental protection and mitigation measures to alleviate / minimize the predicted impacts.

Studies that were undertaken include:

- Fish and Fish Habitat Assessment
- Terrestrial Ecosystem Assessment
- Impact Assessment Studies
- Stage 1 Archaeology Assessment
- Cultural Heritage Assessment
- Contamination Overview Study

For additional information on the studies undertaken, please review the PIC #1 presentation on our website.

Summary of Existing Conditions

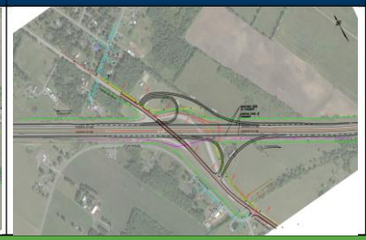
- **Fish & Fish Habitat** – The existing drainage system for the interchange includes twenty-six culverts, nine catch basins, and roadside ditches. There are two mapped tributaries of the South Raisin river located 930 m west of the bridge and 450 m east of the bridge. Both are considered a warmwater fishery.
- **Terrestrial Habitat** - The Study Area can be characterized as primarily rural-agricultural, with nearby rural residential dwellings, and woodlands present. Much of the lands are used for active farming operations. Isolated unevaluated wetlands to the west of Atchison Road, and to the east of the interchange, as well as woodlands east, west and north of the interchange are also found within the Study Area.
- **Species at Risk (SAR) and Significant Wildlife Habitat (SWH) –** There is potential SAR bat roosting habitat situated within private woodlots immediately adjacent to the Study Area (16 potential bat cavity trees identified from fence line surveys). A single butternut tree 2 cm in diameter at breast height (DBH) is also within the Study Area, as well as confirmed sighting of Eastern Meadowlark within a meadow community immediately adjacent to Highway 401 and Power Dam Drive. Additionally, the following migratory birds were audibly heard, or visually observed within the Study Area: Savannah Sparrow, Cedar Waxwing and American Woodcock.
- **Archaeology** – No registered archeological sites are located within one km of any part of the Study Area. Once the Technically Preferred Alternative is confirmed, a Stage 2 archeological assessment will be required within the ROWs where areas of archaeological potential will be affected by the proposed works.
- **Cultural Heritage** – A background review revealed no previously identified features of cultural heritage value within the study area. Seven features were identified during the fieldwork, consisting of four potential Built Heritage Resources and three potential Cultural Heritage Landscapes.
- **Contamination** – One on-site Potentially Contaminating Material (PCA) was identified within the study area.
- **Social Environment** – The Study Area is primarily rural-agricultural with a cluster of rural residential dwellings located 300 m north of the existing bridge. Several residences are located closer to the bridge along Atchison Road, south of Hwy 401.
- **Utilities** – The Study Area is intersected north to south by two Hydro One 230kV overhead electrical transmission lines, which pass through on the west side of Power Dam Drive. Impacts to the transmission lines are anticipated. Underground gas impacts will be confirmed.

Summary of PIC #1

- Four comments were received during the online PIC review period.
- The main themes of comments received included:
  - Replacement is unnecessary – Addressed by explaining the need for replacement of the structure due to age and condition
  - Location of the overpass east of the existing overpass – Addressed by providing clarity on need for project and how existing geometry limits design alternatives
  - Natural hazard and natural heritage features within the area – Addressed by providing information

Evaluation of the Long-List of Alternatives

- Prior to PIC #1 a long-list of alternatives was developed subject to a coarse evaluation to narrow the alternatives down to a short-list for a further, more detailed evaluation. The results of the long-list evaluation are summarized below.

	Alternative 1 Do Nothing	Alternative 2 Straight Bridge, 60° Skew at Existing Bridge	Alternative 3 Straight Bridge, 35° Skew, Parclo AB	Alternative 4 Straight Bridge, 89° Skew, Parclo A2 South of Bridge	Alternative 5 Straight Bridge, 60° Skew, Parclo B2 North of Bridge, Diamond South of Bridge
Alternative Schematic					
Summary					
Key Advantages	✓ No potential impacts to private property or buildings ✓ No natural environment impacts ✓ No cost in the short-term.	✓ Low property impacts ✓ Small overall footprint impacts to natural env. ✓ Partial power line relocation ✓ Ramps to/from the east can be added in the future.	✓ Ramps to/from the east can be added in the future ✓ Moderate environment impacts ✓ Power Dam Drive through continuous and direct ✓ Maintain design speed on both sides of Highway 401 ✓ Tangent alignment on structure ✓ Does not require full time detour while constructing the new bridge.	✓ Moderate property impact ✓ Low environmental impacts ✓ Ramps to/from the east can be added in the future ✓ Preferred structural layout. ✓ W-N movement is accommodated.	✓ Moderate property impacts ✓ Low environmental impacts ✓ Ramp to/from the east can be added in the future ✓ Partial power line relocation. ✓ Power Dam Drive through traffic not required to manage sharp deflection north of Highway 401 ✓ W-N movement is accommodated.
Key Disadvantages	✗ No new connections provided ✗ W-N movement is not accommodated ✗ Short- and long-term vehicular demands will not be met ✗ Does not address Study objectives.	✗ Detour is required for entire construction duration ✗ Power Dam Drive not continuous north of Highway 401 for through traffic ✗ W-N movement is not accommodated ✗ Impacts private properties and buildings.	✗ Power line relocation ✗ High skew angle not desirable from structural perspective	✗ Power line relocation ✗ Power Dam Drive not continuous north of Highway 401 for through traffic	✗ Detour is required for the entire construction duration ✗ Power line relocation ✗ High impact to water quality, runoff volume, and peak flow
Recommendation	**CARRY FORWARD** (for comparison purposes)	**DO NOT CARRY FORWARD**	**CARRY FORWARD**	**DO NOT CARRY FORWARD**	**CARRY FORWARD**

Evaluation of the Long-List of Alternatives

	Alternative 6 Curved Bridge, 60° Skew, Parclo B2	Alternative 7 Straight Bridge, 60° Skew, Parclo B2 South of Bridge	Alternative 8 Straight Bridge, 41° Skew, Single Diamond Interchange	Alternative 9 Curved Bridge, 49° Skew, Parclo A2	Alternative 10 Straight Bridge, 90° Skew, Parclo A2
Alternative Schematic					
Summary					
Key Advantages	✓ Low property impacts ✓ Small overall footprint impacts to natural env. ✓ Partial power line relocation ✓ Ramps to/from the east can be added in the future ✓ Power Dam Drive through traffic not required to manage sharp deflection north of Highway 401 ✓ Maintain design speed on both sides of Highway 401 ✓ W-N movement is accommodated	✓ Partial power line relocation ✓ Moderate environment impacts ✓ Ramps to/from the east can be added in the future ✓ Power Dam Drive through traffic not required to manage sharp deflection north of the highway ✓ Tangent alignment on structure	✓ Ramps to/from the east can be added in the future ✓ Moderate environment impacts ✓ Power Dam Drive through continuous and direct ✓ Maintain design speed on both sides of Highway 401 ✓ Tangent alignment on structure ✓ Does not require full time detour while constructing the new bridge	✓ More typical Interchange layout ✓ Ramps to/from the east can be added in the future ✓ All movements are accommodated	✓ More typical Interchange layout ✓ Ramps to/from the east can be added in the future ✓ All movements are accommodated ✓ Straight structure
Key Disadvantages	✗ Complex and more expensive structure	✗ No consistent speed due to roundabout north of Highway 401 ✗ No consistent speed due to roundabout south of Highway 401	✗ High skew angle not desirable from structural perspective	✗ High property impact ✗ High environmental impacts ✗ High cost ✗ Greater utility impact ✗ Complex structure ✗ Provide two on ramps per direction may not be needed.	✗ Significant property impacts ✗ High environmental impacts ✗ Major realignment of Power Dam Drive and large curve introduced. ✗ Additional auxiliary lanes required to meet sightlines that are not warranted based on traffic volumes.
Recommendation	CARRY FORWARD	DO NOT CARRY FORWARD	CARRY FORWARD	DO NOT CARRY FORWARD	DO NOT CARRY FORWARD

After completing the evaluation of the Long-List of Alternatives, the Study Team has carried forward 5 Alternatives and undertaken a detailed evaluation of the 5 Short-List Alternatives to recommend the Technically Preferred Alternative. To review the designs of the Long-List of Alternatives in greater detail, please refer to the following https://highway401powerdam.azurewebsites.net/Documents/Long%20List%20Alternatives.pdf.

Short-List of Alternatives

The Short-List of Alternatives represents the alternatives that have the best ability to address future capacity and operational issues, improve safety conditions, and minimize overall impacts to the natural, social, economic, and cultural environment.

The alternatives carried forward to the Short-List of Alternatives are the following:

- Alternative 1: Do Nothing
- Alternative 3: Parclo AB
- Alternative 5: Parclo B2 – North
- Alternative 6: Parclo B2 – South
- Alternative 8: Diamond Interchange

These Short-List Alternatives were further refined during the evaluation and design development process.

Short-List Alternatives

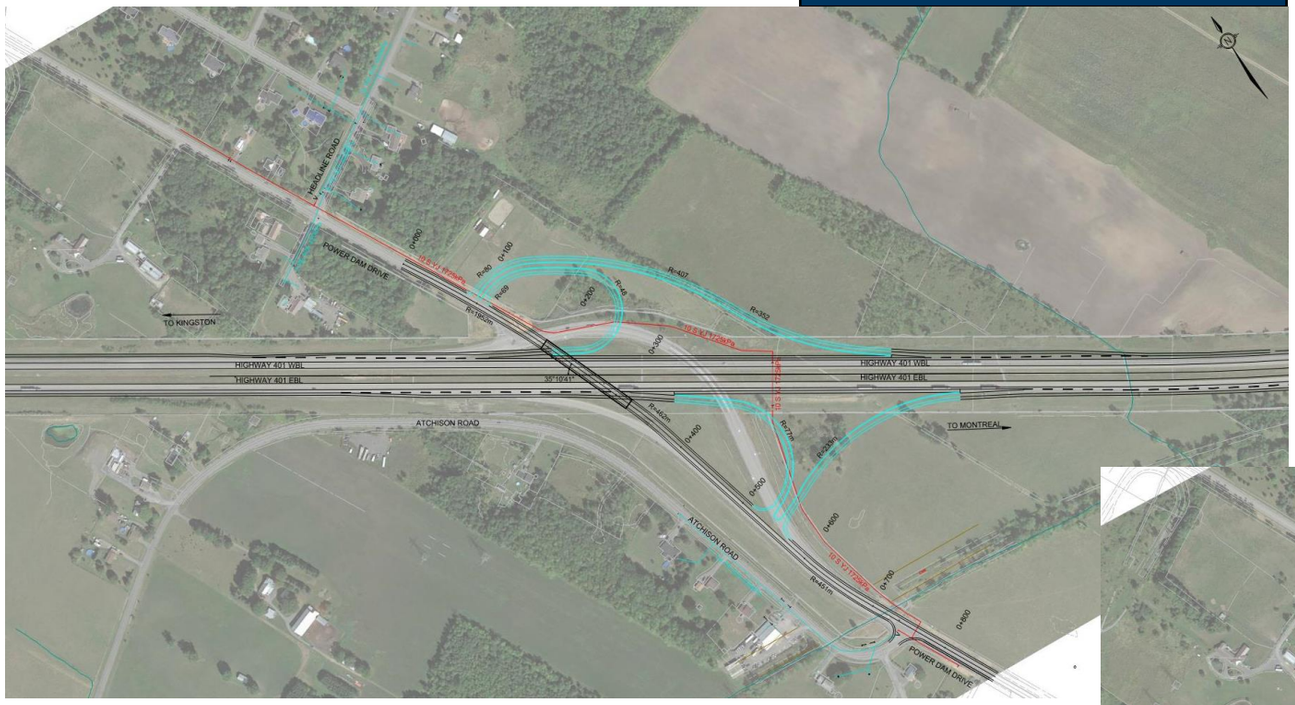
Alternative 1: Do Nothing

Alternative 1: Do Nothing involves the replacement of the existing bridge with a new bridge in the same configuration on the current location. This alternative does not involve any interim modifications to improve roadway geometrics or incorporate future interchange options.

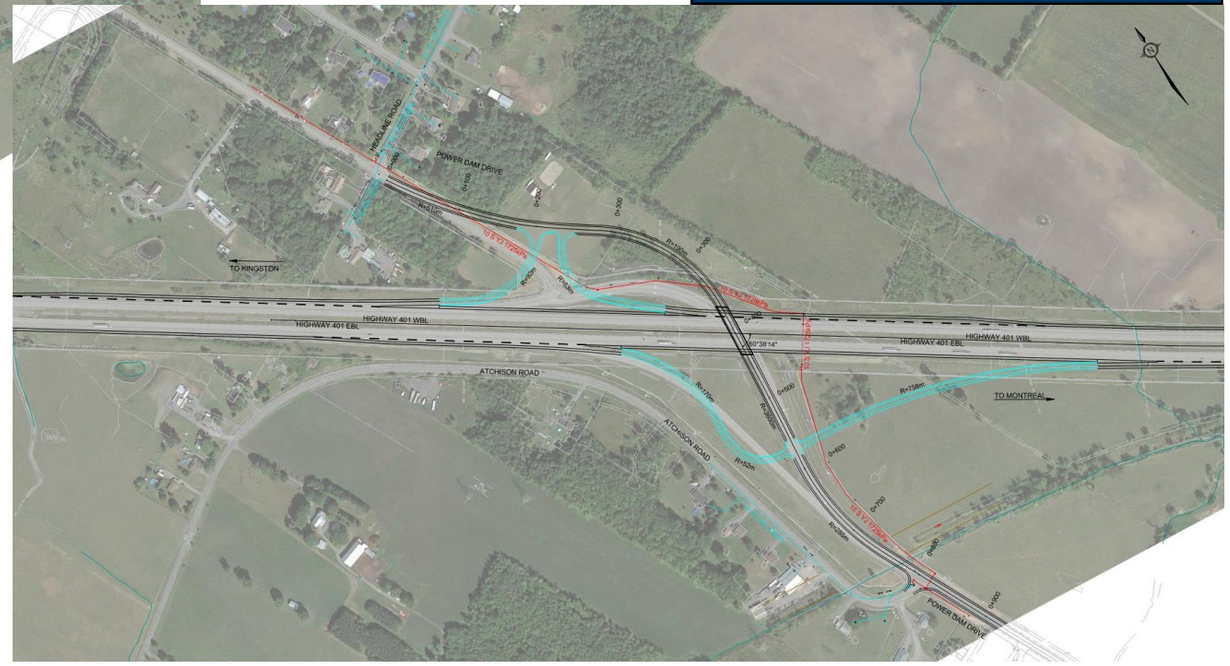
While this alternative involves limited impacts compared to other Short-Listed Alternatives, it ultimately does not address the current or future needs for Highway 401 at Power Dam Drive and was used for comparison purposes only.

Short-List Alternatives

Alternative 3: Parclo AB



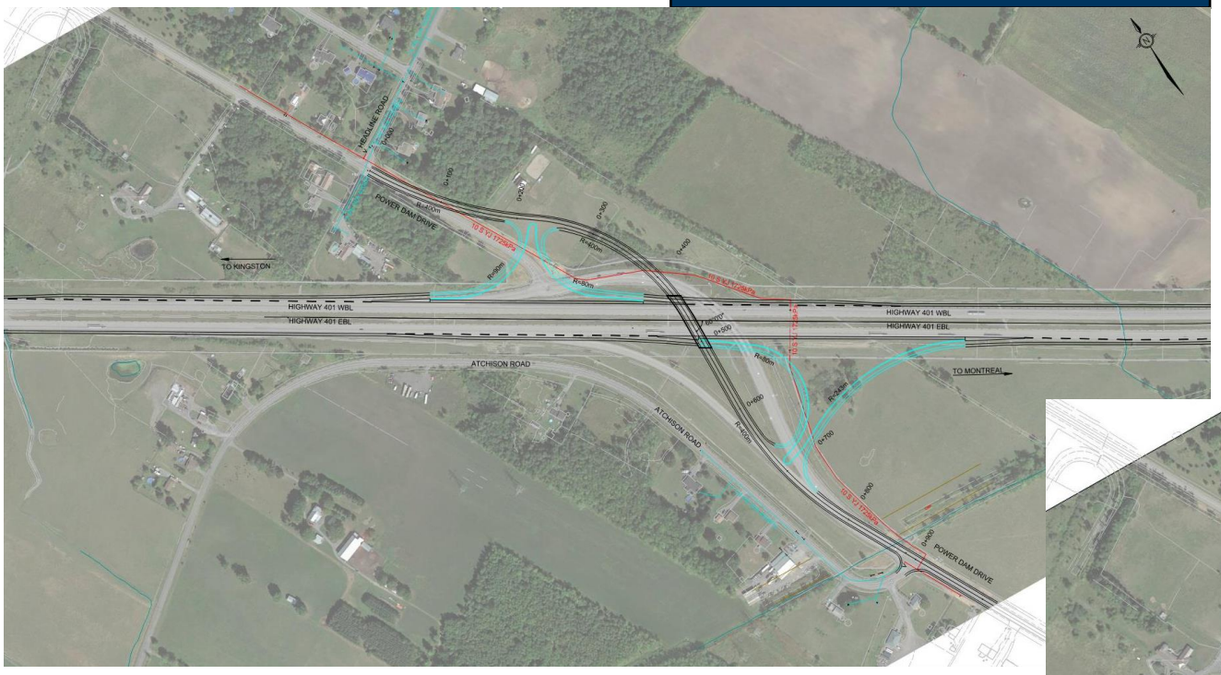
Alternative 5: Parclo B2 - North



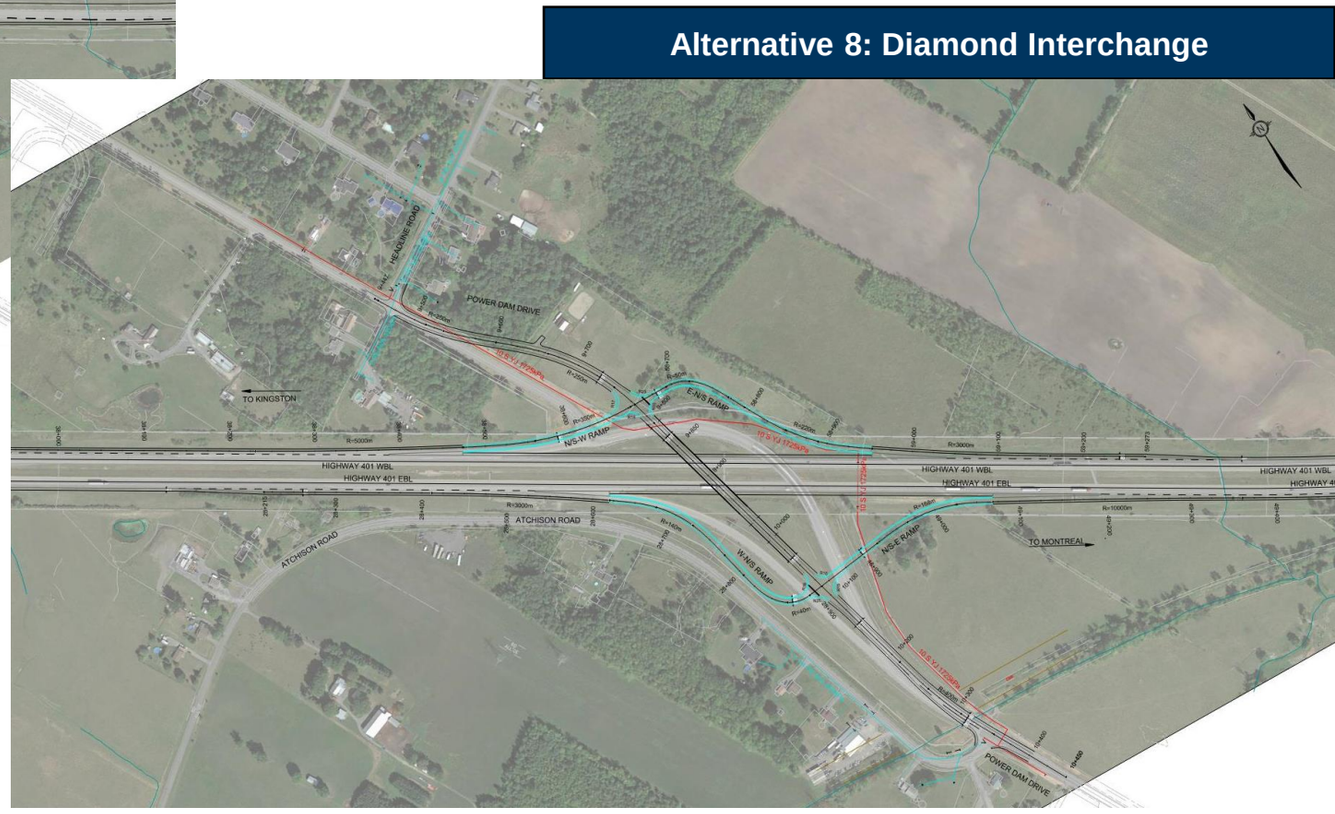
To review the designs of the Short-List of Alternatives in greater detail, please refer to the following https://highway401powerdam.azurewebsites.net/Documents/Short%20List%20Alternatives.pdf.

Short-List Alternatives

Alternative 6: Parclo B2 – South



Alternative 8: Diamond Interchange



To review the designs of the Short-List of Alternatives in greater detail, please refer to the following https://highway401powerdam.azurewebsites.net/Documents/Short%20List%20Alternatives.pdf.

Evaluation of Short-List Alternatives

The following components and criteria were used to evaluate the short-list of alternatives

Evaluation Component	Evaluation Criteria	Alternative 1: Do Nothing	Alternative 3: Parclo AB	Alternative 5: Parclo B2 North	Alternative 6: Parclo B2 South	Alternative 8: Diamond Interchange
Transportation	Level of Service / Delays					
	Municipal Road Impacts					
	Active Transportation					
	Ramp Geometry					
	Structure Layout					
	Conflict zones, Collision risks					
	Future Interchange Needs					
Constructability	Cost					
	Utility Conflicts					
	Construction Impacts					

 Most Preferred

 More Preferred

 Moderately Preferred

 Less Preferred

 Least Preferred

Evaluation of Short-List Alternatives

Evaluation Component	Evaluation Criteria	Alternative 1: Do Nothing	Alternative 3: Parclo AB	Alternative 5: Parclo B2 North	Alternative 6: Parclo B2 South	Alternative 8: Diamond Interchange
Environment (Natural and Social/Cultural)	Fisheries Impact					
	Wildlife/Habitat					
	Water Resources					
	Property					
	Agriculture					
	Archaeological					

To review the designs of the Short-List of Alternatives in greater detail, please refer to the following https://highway401powerdam.azurewebsites.net/Documents/Short%20List%20Alternatives.pdf.

Evaluation Results

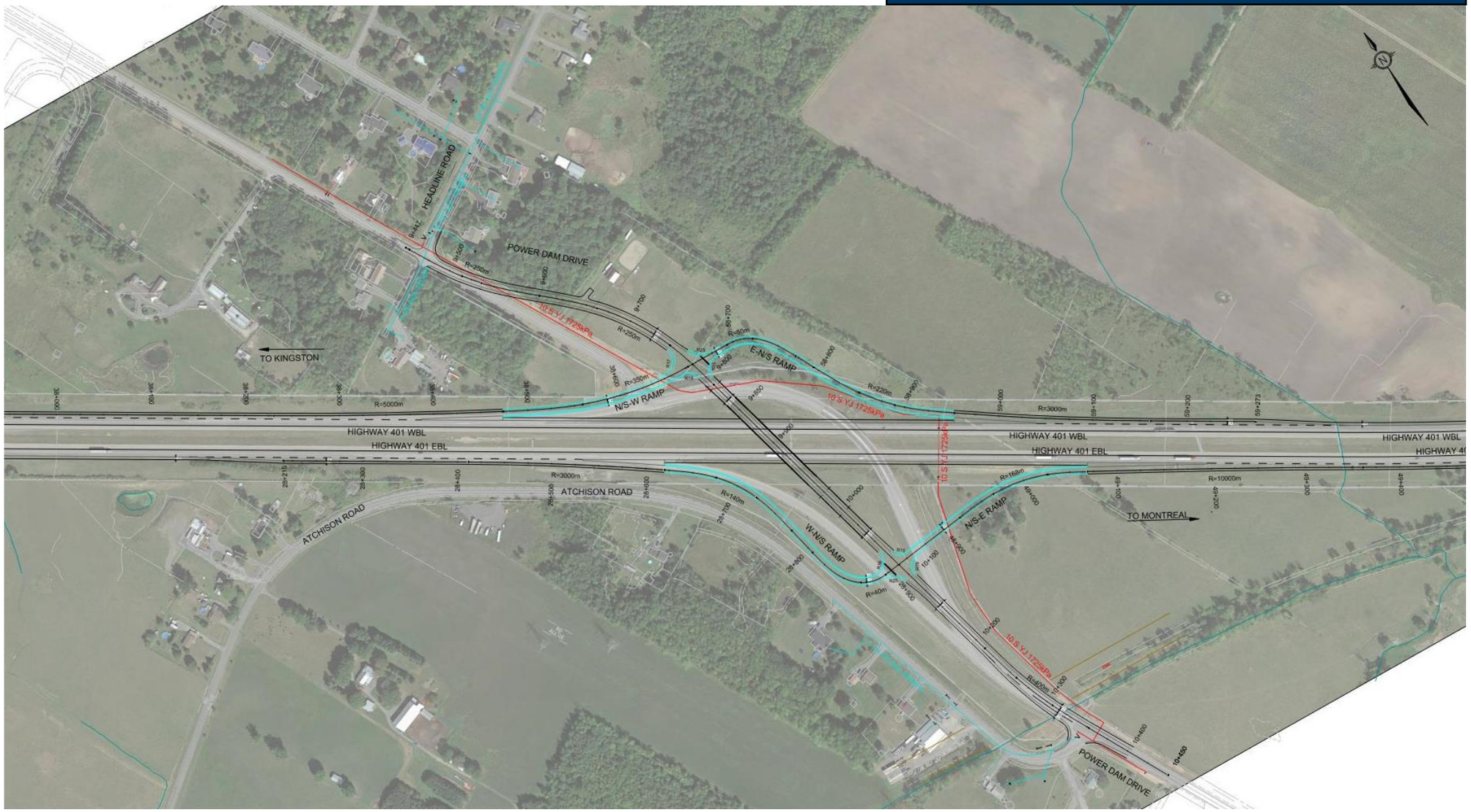
Evaluation Summary

Evaluation Component	Alternative 1: Do Nothing	Alternative 3: Parclo AB	Alternative 5: Parclo B2 North	Alternative 6: Parclo B2 South	Alternative 8: Diamond Interchange
Transportation					
Constructability/Cost					
Environment					
Overall					
Results	Not Recommended	Not Recommended	Not Recommended	Not Recommended	**Recommended**

- Based on the results of the evaluation, **Alternative 8: Diamond Interchange** is the recommended Technically Preferred Alternative. This alternative achieves the objectives of the study by addressing current and future demand needs, while resulting in the least amount of impacts to the evaluation components of Transportation, Constructability/Cost, and Environment.
- As part of the Recommended Plan, a partial interchange is proposed to be constructed in the interim to ensure future ramps can be accommodated when a full interchange is warranted.
- Pending completion of the EA and subject to funding, the Technically Preferred Alternative and Recommended Plan will proceed to the next design phase and eventually construction.

Technically Preferred Alternative

Alternative 8: Diamond Interchange



Morrison Hershfield now Stantec

Interchange Implementation

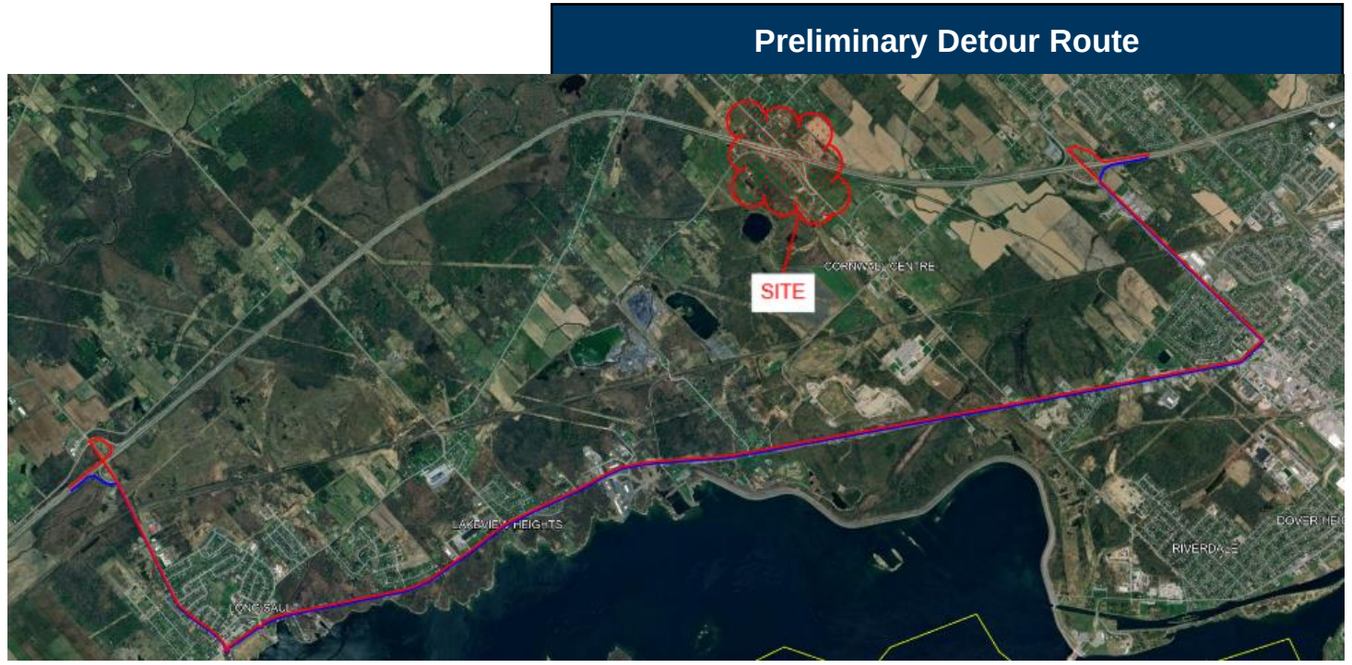
- The traffic analysis completed by Study team has identified that there is no current need for a full interchange at the design horizons of 10 and 20 years beyond construction based on traffic volumes and current growth projections. Ultimately, however, an expansion of capacity at the Highway 401 and Power Dam Drive may be required.
- To accommodate for this future need, a partial interchange is being proposed. This partial interchange will be constructed in the interim to ensure future ramps can be accommodated when a full interchange is warranted. The phased approach with the “Interim configuration” is proposed to coincide with the bridge replacement and realign the existing ramps to tie into the new structure and Power Dam Drive alignment.
- The partial interchange will maintain the level of service with the Brookdale Interchange to the East.
- Potential Environmental Impacts resulting from the Technically Preferred Alternative include vegetation removal, impacts to wildlife and wildlife habitat due to construction, minor impacts to fish habitat to occur in low sensitivity habitat, and potential impacts to Species at Risk. To ensure environmental impacts are minimized, mitigation measures and timing windows will be implemented during construction.
- To implement the Technically Preferred Alternative, property acquisition will be required. Preliminary discussions are currently underway with impacted property owners.

Interim Configuration

Potential Detour Routes During Construction

To construct the planned improvements to Highway 401 and Power Dam Drive, roadway closures will be required.

While final closures, durations, and routes will be confirmed during the Detail Design phase of the project, the following routes are currently under consideration as part of the Preliminary Design.



- Highway 401 and ramp closures: Closures for girder erection and ramp tie-ins are being considered as part of the Preliminary Design. A detour using Brookdale, Hwy 2, Moulinette are available.
- Power Dam Drive: Closures for tie-ins and grading changes are required. Local road detours are available using Cornwall Centre Rd or County Road 36.

Next Steps and How to Stay Informed

Following this Online PIC, we will:

- Respond to comments received
- Refine the results based on the feedback received during consultations, if required
- Prepare the Transportation Environmental Study Report (TESR) for 30-day public and agency review
- Finalize the Preliminary Design

Consultation and engagement with Indigenous Communities, the public, regulatory agencies, municipal governments, emergency services providers, and utility companies is on-going throughout the Study.

Thank you for participating in this Online PIC. Pending completion of the EA and subject to funding, the Technically Preferred Alternative will proceed to the next design phase (Detail Design) and eventually to construction.

We welcome and encourage your comments, by using the online comment form available on the project website http://www.highway401powerdam.com, or alternatively, by emailing either of the Project Team members listed below. We would greatly appreciate receiving your comments by **June 30, 2024**.

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