



Preliminary Design and Environmental Assessment for Highway 401 from Cranberry Road to County Road 28 (Ontario Street), Port Hope

STUDY #1 GWP 4005-17-00

Online Public Information Centre #1

LIVE FROM AUGUST 5– SEPTEMBER 2, 2021

www.Hwy401PortHopeEA.com



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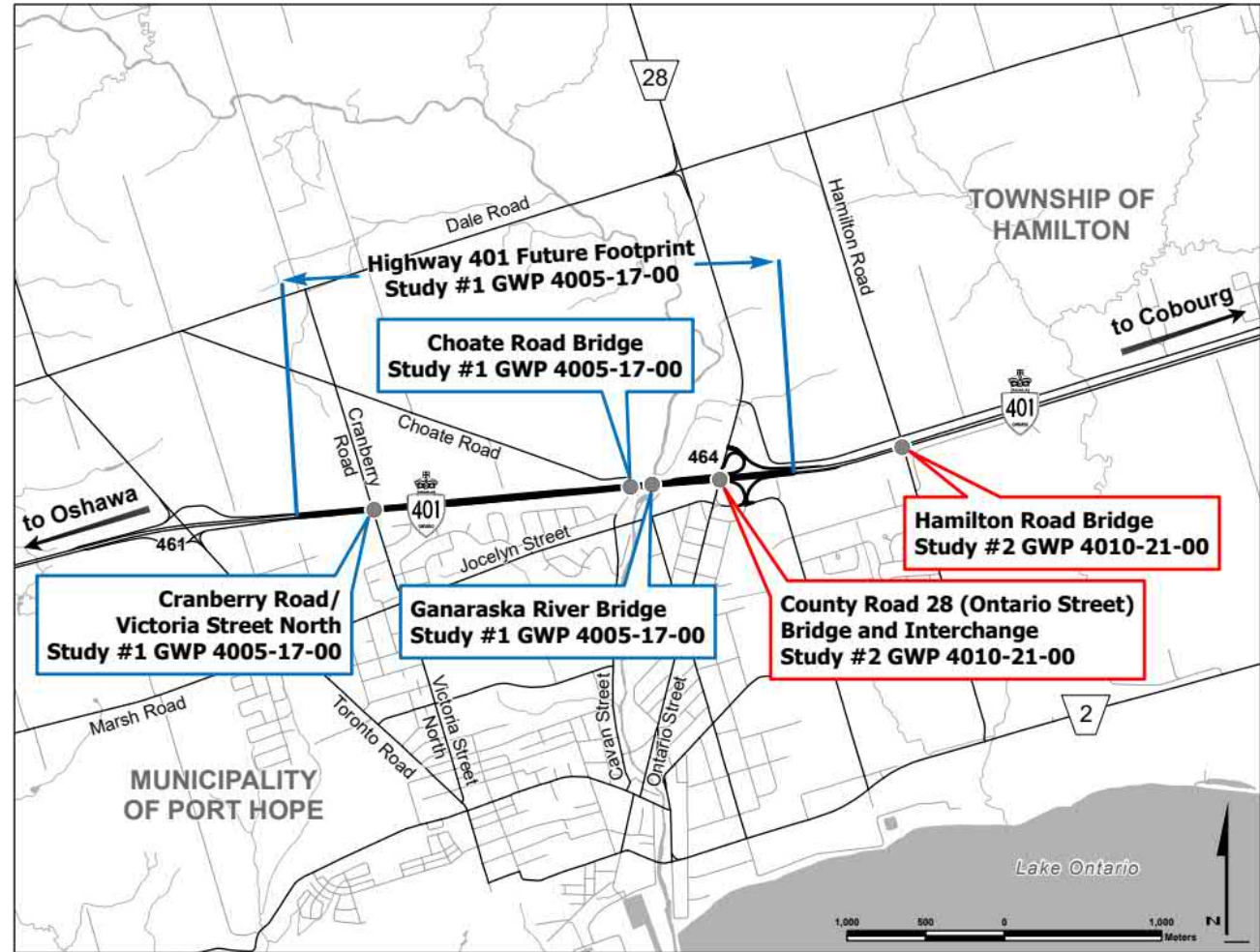
PROJECT DESCRIPTION AND PURPOSE

The Ministry of Transportation (MTO) has retained the services of McIntosh Perry Consulting Engineers Ltd. and LEA Consulting Ltd. Joint Venture (MP-LEA Joint Venture) to carry out the Preliminary Design and Class Environmental Assessment (Class EA) for Highway 401 from 500m west of Cranberry Road to 450m east of County Road 28, including the Cranberry Road bridge, Choate Road bridge, Ganaraska River bridge, Hamilton Road bridge and County Road 28 (Ontario Street) Interchange in Port Hope.

The initial study has been divided into two (2) separate Class EA studies:

STUDY # 1 GWP 4005-17-00 includes structural needs of 3 bridges (Cranberry Road Bridge, Choate Road Bridge and Ganaraska River Bridge) and establishing the eight (8) and ten (10) lane future footprint of Highway 401 from 500m west of Cranberry Road to 450m east of County Road 28 (Ontario Street).

STUDY #2 GWP 4010-21-00 includes future operational long-term needs at the County Road 28 (Ontario Street) interchange, and structural needs of 2 bridges (County Road 28 bridge and Hamilton Road Bridge). Study #2 will be presented as part of a separate consultation process.



The study is being carried out in accordance with the approved environmental planning process for Group ‘B’ projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000)*.

A **Transportation Environmental Study Report (TESR)** will be prepared to summarize the study process and recommendations. Upon completion, the TESR will be made available for a 30-day public review and comment period.

Upon completion of the 30-day public review period and provided there are no outstanding concerns, the study will be considered to have met the requirements of MTO’s Class EA process.



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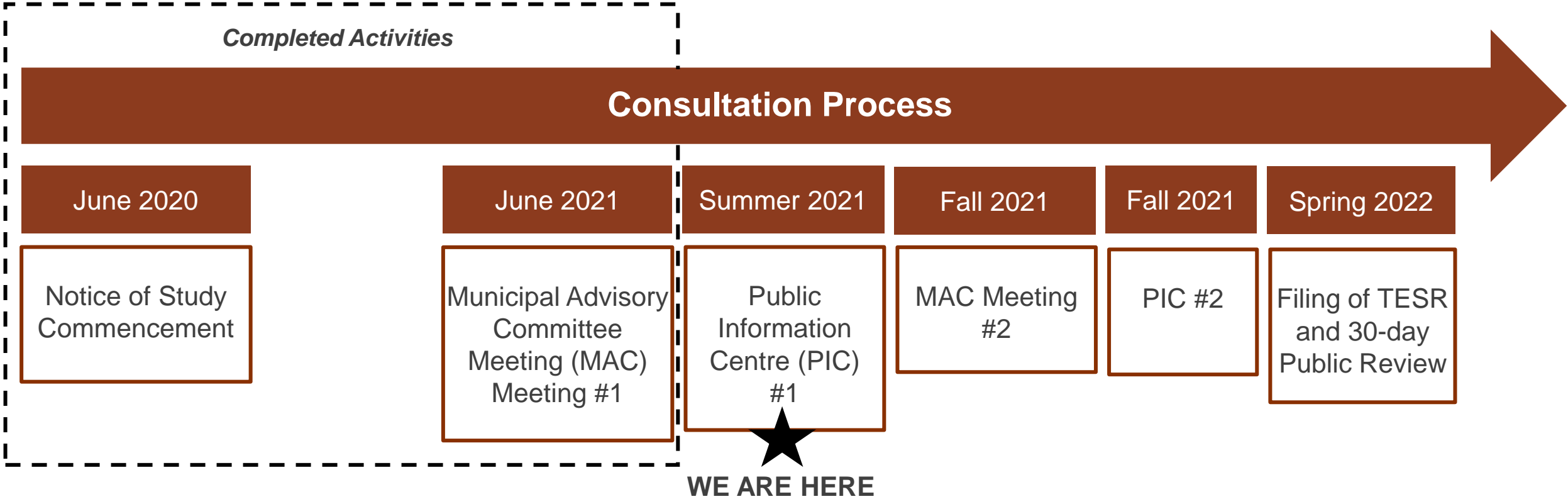
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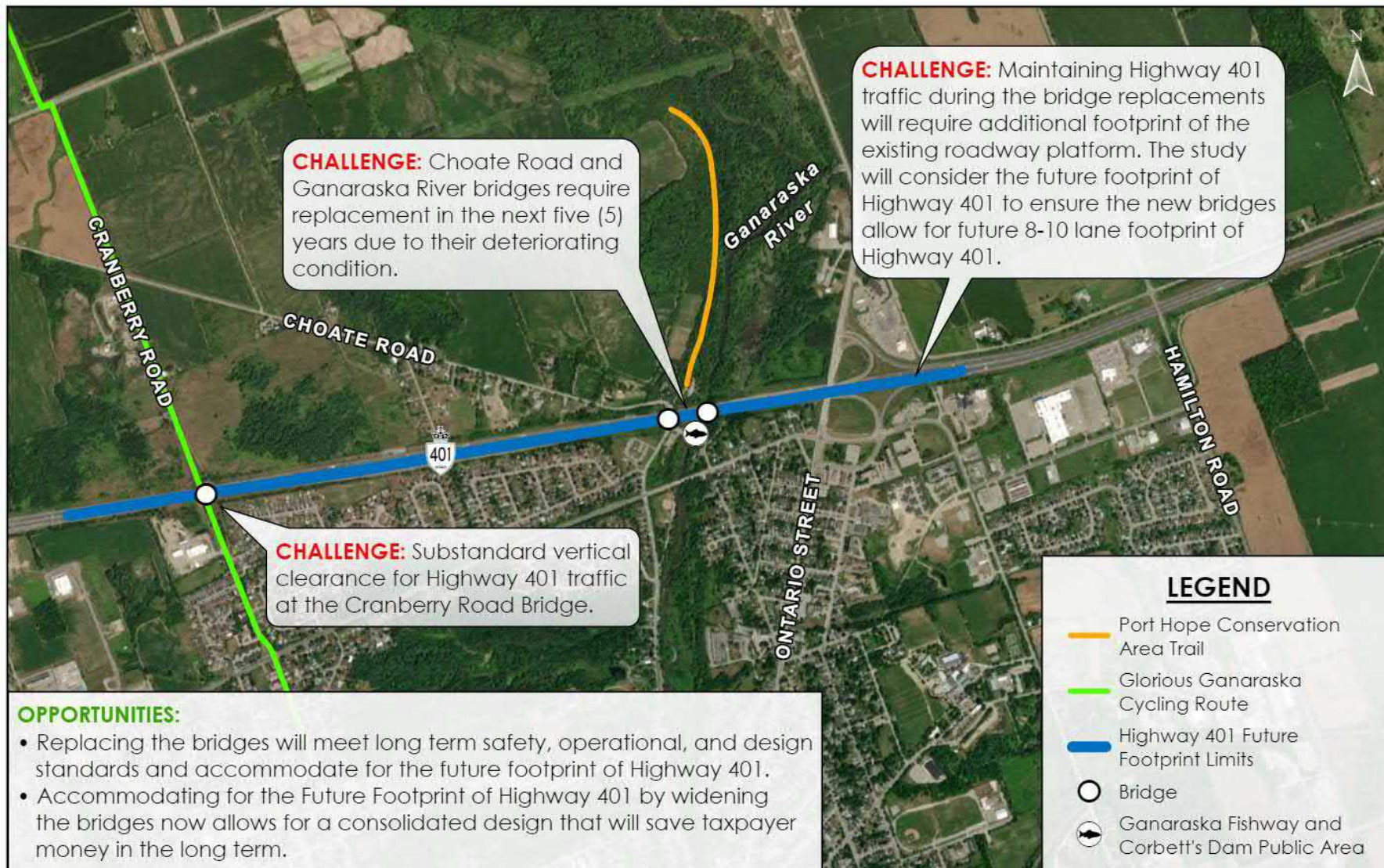
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- **Port Hope Area Initiative (PHAI)**
- **Municipality of Port Hope, Township of Hamilton and County of Northumberland**




Consultation and engagement opportunities that are being conducted at key points throughout the study include:



CHALLENGES AND OPPORTUNITIES



As part of the preliminary design and Class EA process, the Project Team identified and assessed alternatives to the undertaking to ensure that there is reasonable justification to proceed with the project. Planning alternatives considered include:

1	DO NOTHING The bridges and highway would remain 'as is'	NOT RECOMMENDED This alternative does not address the transportation issues within the study area, including the aging bridges that require replacement	
2	BRIDGE/HIGHWAY REHABILITATION	NOT RECOMMENDED This alternative does not accommodate for the Highway 401 future footprint	
3	BRIDGE REPLACEMENT/HIGHWAY FUTURE FOOTPRINT	RECOMMENDED This alternative will address the structural deficiencies at the bridges and will accommodate for the Highway 401 future footprint	

Alternatives one (1) and two (2) were not carried forward as they do not meet the overall project needs (at any location), including accommodating for the Highway 401 future footprint or addressing key operational and structural deficiencies in the long-term. Alternative three (3) is the preferred planning alternative to the undertaking.

STUDY	DATE
Fisheries Impact Assessment	Anticipated Fall 2021
Terrestrial Impact Assessment	Anticipated Fall 2021
Landscape Composition Report	Anticipated Fall 2021
Noise Assessment Report	Anticipated Fall 2021
Erosion and Sediment Overview Risk Assessment Report	Anticipated Fall 2021
Cultural Heritage Assessment	Complete
Archaeology Report	Complete
Designated Substance Survey	Complete
Contamination Overview Study	Complete
Groundwater Assessment Report	Complete

The following slides present the short list alternatives for the Cranberry Road, Choate Road and Ganaraska River bridges as well as for the Highway 401 future footprint. The evaluation criteria that has been identified to help select the design alternatives includes:

Natural Environment

- *Direct and indirect impacts to:*
 - Floodplain
 - Fish and fish habitat
 - Wildlife and Vegetation
 - Species at Risk
 - Groundwater and Surface Water
 - Significant Natural Areas such as the Ganaraska River

Socio Economic Environment

- Impacts to private properties
- Access for local residents, school buses and emergency vehicles
- Noise
- Land use impacts such as at the Port Hope Conservation Area and Corbett's Dam Public Area
- Cycling and Pedestrian impacts
- Impacts to heritage features
- Disturbance of contaminated soils

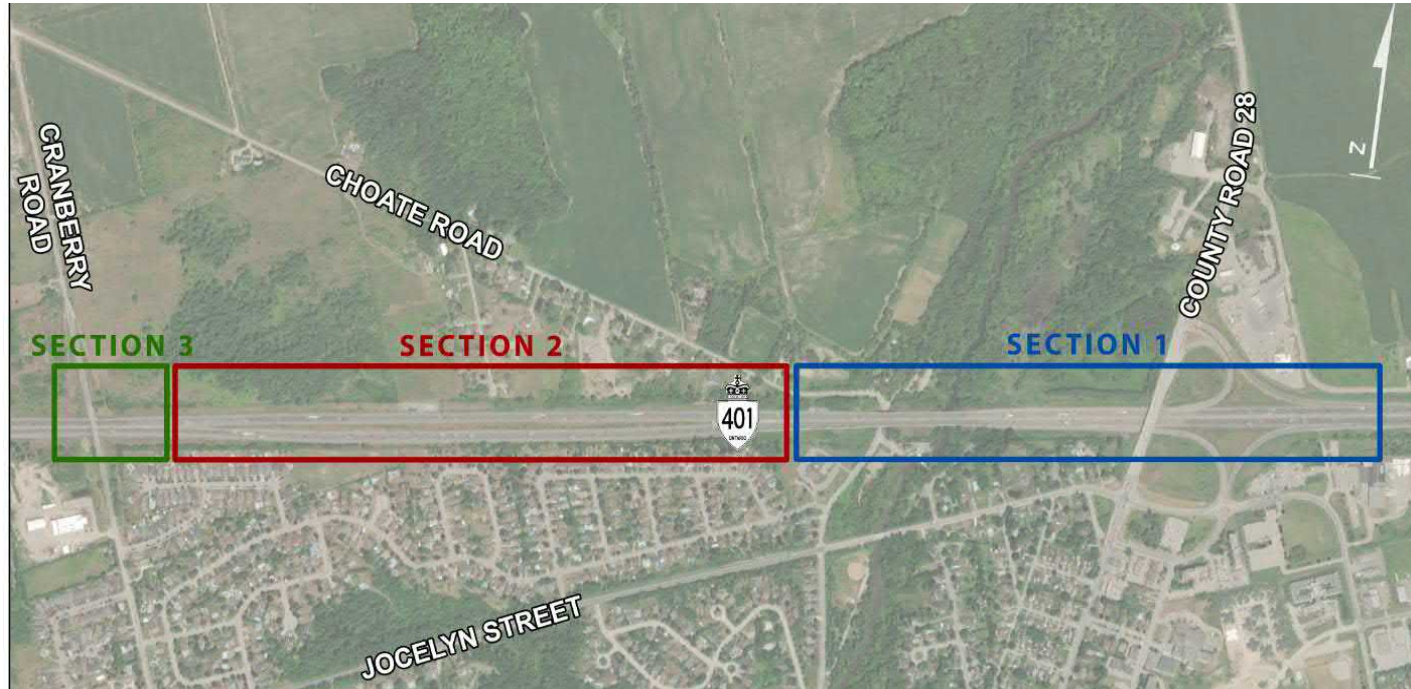
Transportation/Technical Considerations

- Complexity of construction staging
- Construction duration
- Cost
- Delays to emergency services
- Municipal road impacts
- Detour routes
- Traffic disruptions
- Conflict with utilities

HIGHWAY 401 FUTURE FOOTPRINT

HIGHWAY 401 FUTURE FOOTPRINT ALTERNATIVES

Highway 401 in this location is a six (6) lane divided highway with three (3) eastbound lanes and three (3) westbound lanes. The highway has been broken out into three (3) different sections to evaluate alternatives for the future footprint of Highway 401:



Section 3 - 50m west of Cranberry Road to 150m east of Cranberry Road

- Paved median and tall wall barrier.
- Land use includes agricultural and residential uses, as well as the Port Hope Public Works facility.

Section 2 - 150m east of Cranberry Road to 190m west of Choate Road

- Variable width grass/sloping median with grade difference between eastbound and westbound directions.
- Dense residential areas south of the highway

Section 1 - 190m west of Choate Road to 450m east of County Road 28

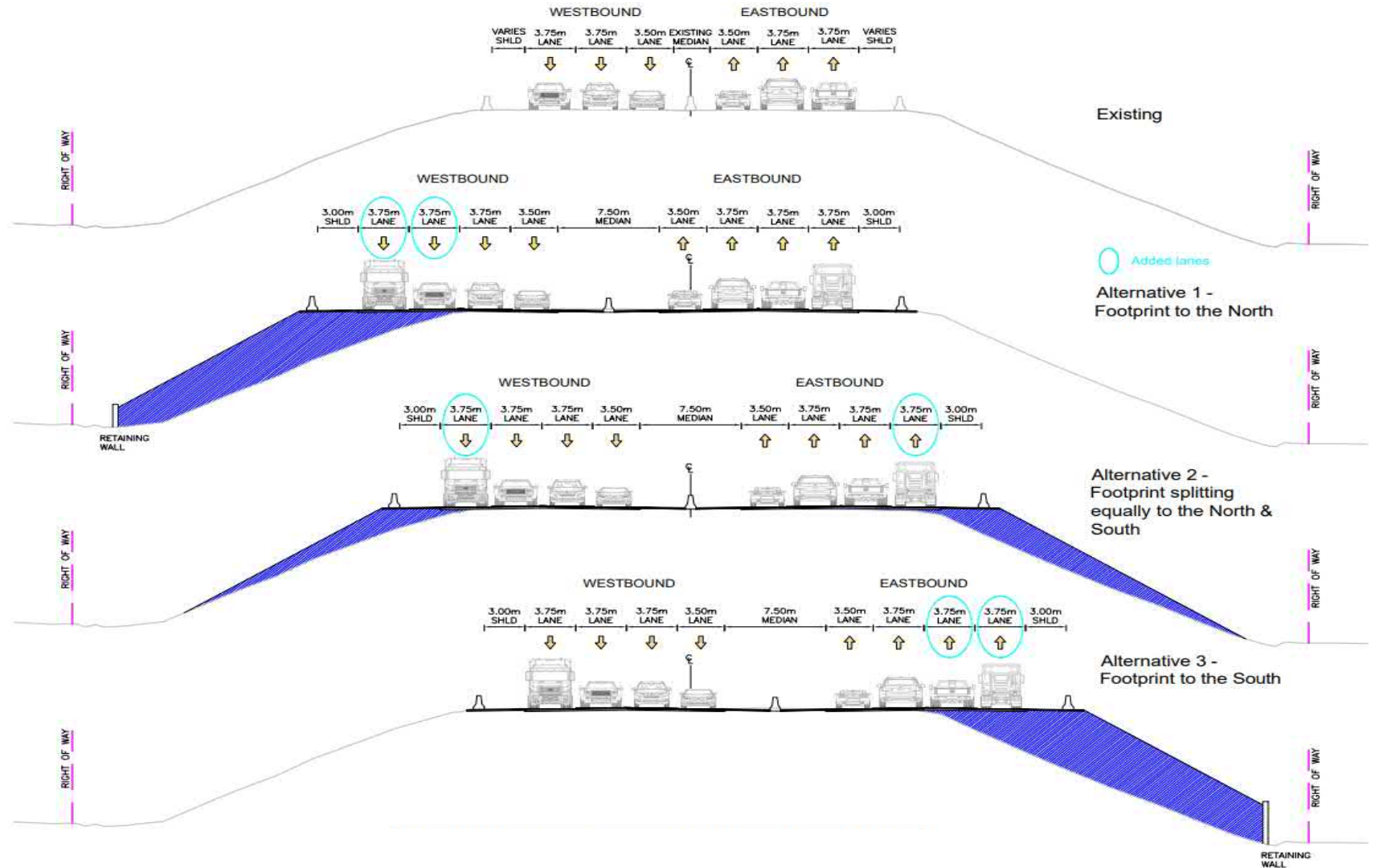
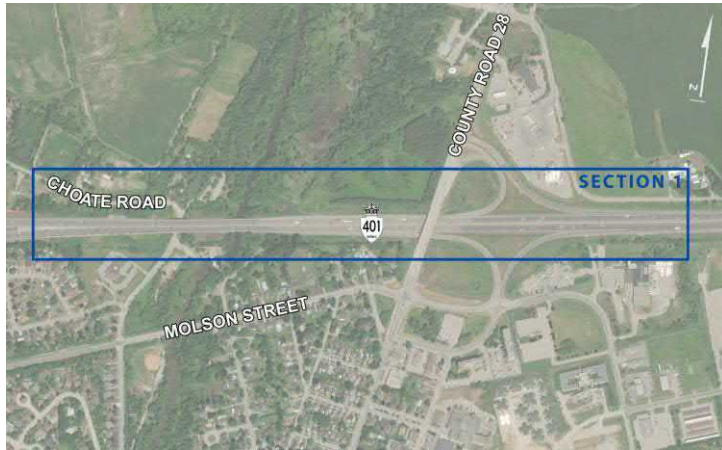
- Paved median and tall wall barrier.
- Land use includes Ganaraska Region Conservation Area and Corbett's Dam Public Area.
- Cultural heritage resources including buildings and landscapes located north and south of the highway.

3 alternatives were considered for each Section for the Highway 401 future footprint:

- 1 Extend Highway 401 fully to the north
- 2 Split the extension for each direction of Highway 401
- 3 Extend Highway 401 fully to the south

HIGHWAY 401 FUTURE FOOTPRINT ALTERNATIVES

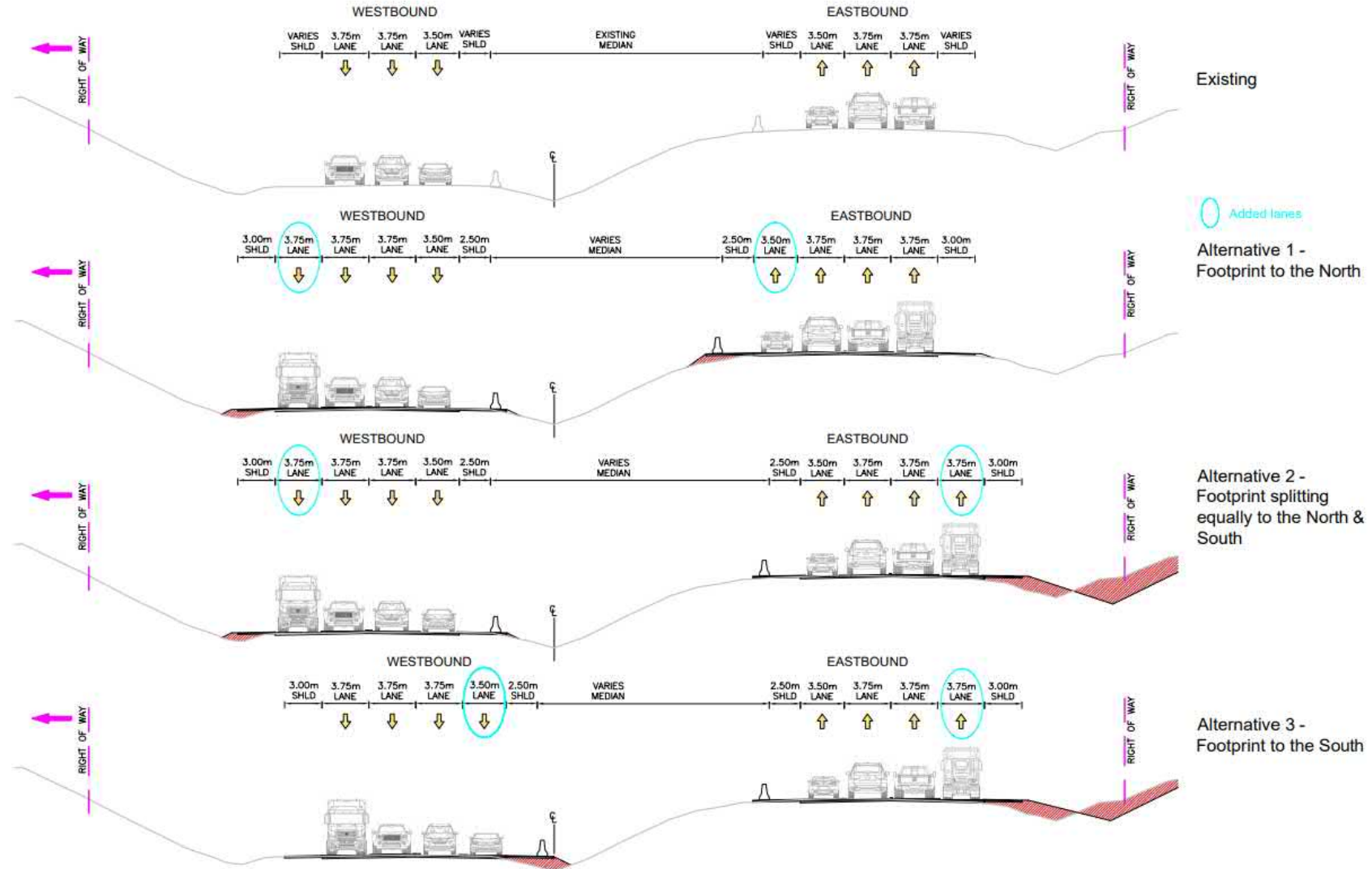
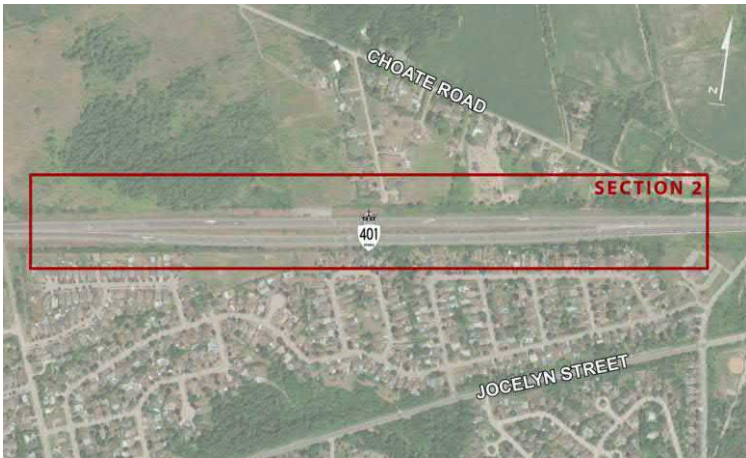
Section 1 (east end) Alternatives:



* SHLD = Road shoulder
 Right Of Way = MTO property limit

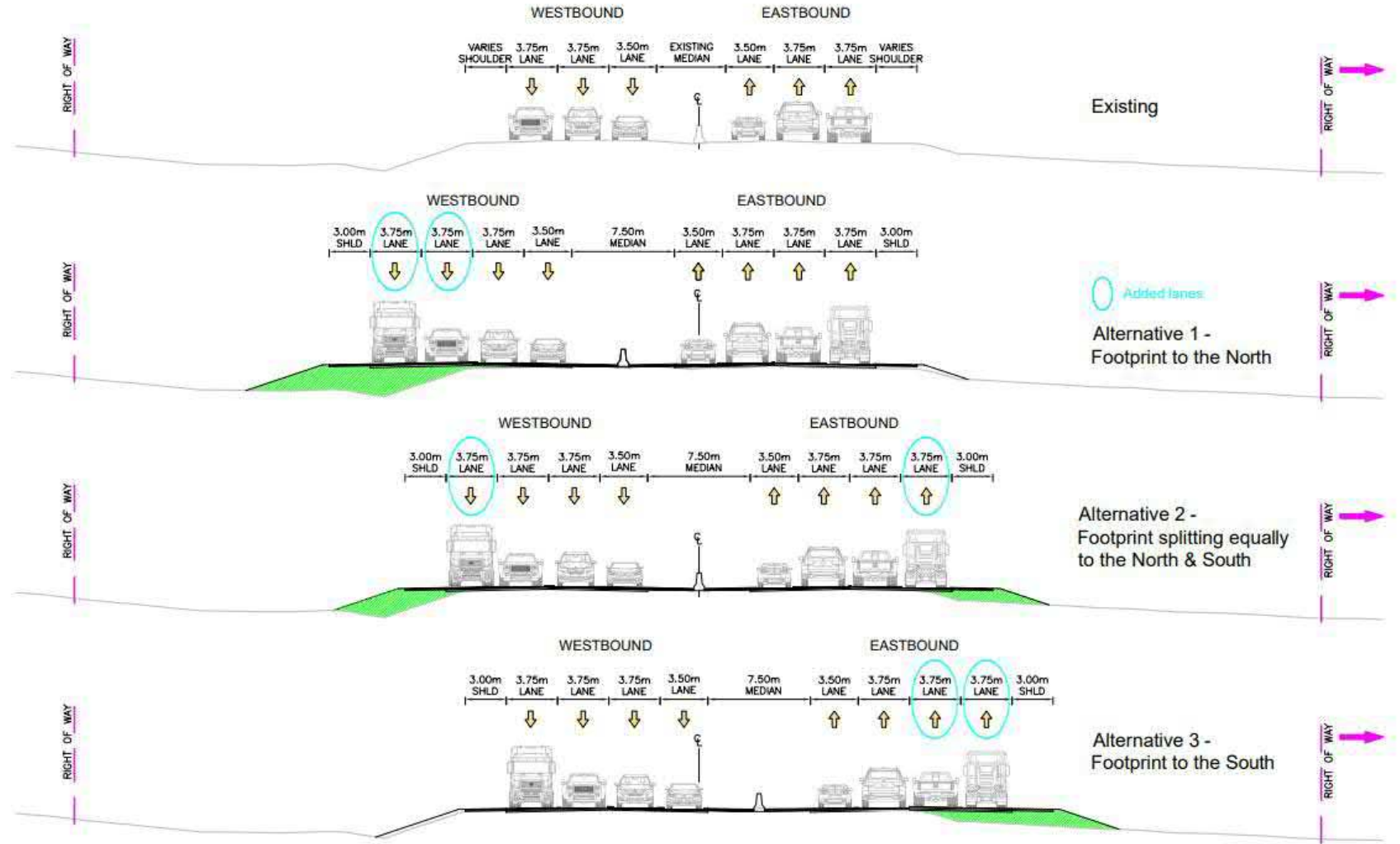
HIGHWAY 401 FUTURE FOOTPRINT ALTERNATIVES

Section 2 (middle) Alternatives:



* SHLD = Road shoulder
 Right Of Way = MTO property limit

Section 3 (west end) Alternatives:



* SHLD = Road shoulder
Right Of Way = MTO property limit

CRANBERRY ROAD BRIDGE

CRANBERRY ROAD BRIDGE EXISTING ENVIRONMENTAL CONDITIONS

Social and Cultural Environment

Archaeology

- Lands adjacent to the Cranberry Road bridge do not contain archaeological significance.

Cultural Heritage

- The Cranberry Road bridge is not a heritage bridge.

Land Use

- Lands surrounding the Cranberry Road bridge are agricultural, institutional and residential.

Natural Environment

- SAR bird (Eastern Meadowlark) was observed.
- No watercourses are found within the study area.

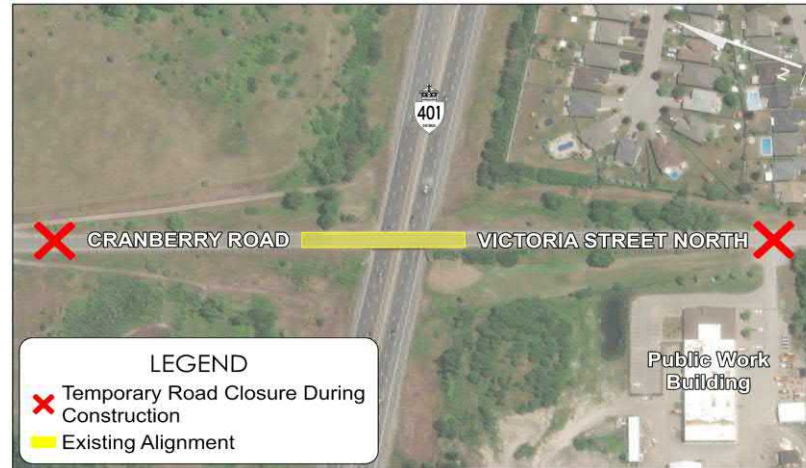


1 Replacement on Existing Alignment
Staged Traffic (Carried Forward) ✓



- Advantages:**
- Low impacts to nearby residents and businesses
 - Lower construction costs associated with embankment reconstruction.
 - Maintains one-lane two-way operation.
- Disadvantages:**
- Throw away and additional construction staging costs
 - Longer construction duration.
- Rationale:** Maintains traffic at the bridge during construction and has a lower impact to residents and businesses in the vicinity of the bridge.

2 Replacement on Existing Alignment
Full Closure (Carried Forward) ✓



- Advantages:**
- Shorter construction duration.
 - Low construction cost associated with staging.
 - Lower construction costs associated with embankment reconstruction.
- Disadvantages:**
- Increased travel time for commuters and emergency medical services (EMS) due to detour.
- Rationale:** Lower cost, shorter construction duration, and simplifies staging to increase worker safety.

3a Replacement on New Alignment –
West (**Not Carried Forward**) ✗



- Advantages:**
- Maintains two traffic lanes during construction.
- Disadvantages:**
- Larger permanent property acquisition required.
 - Throw away construction cost associated with new alignment.
- Rationale:** Utility impacts and property acquisition needs are higher. Impacts to the Public Works yard are anticipated.

3b Replacement on New Alignment – East (Not Carried Forward)



Advantages:

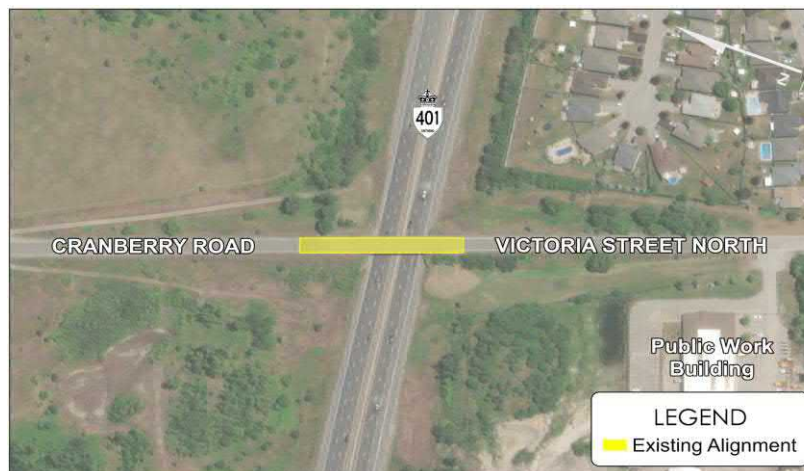
- Maintains two traffic lanes during construction.

Disadvantages:

- Larger permanent property acquisition required.
- Throw away construction cost associated with new alignment.

Rationale: Utility impacts and property acquisition needs are higher. Private property impacts to the homes on the Spicer Street cul-de-sac are anticipated.

4 Accelerated Replacement, Existing Alignment (Not Carried Forward)



Advantages:

- Minimal impact to residents and motorists.
- Reduces construction duration.

Disadvantages:

- Temporary property required for staging area.
- High capital cost and high throw away construction cost.

Rationale: Low Annual Average Daily Traffic (AADT) on Cranberry Road does not warrant the high cost associated with this alternative

5 Permanent Closure (Not Carried Forward)



Advantages:

- Minimal capital cost.
- No permanent property acquisition required.

Disadvantages:

- Eliminates crossing for local traffic.
- Major impacts to local road network.
- Increased travel time for residents.

Rationale: Cranberry Road is important to the local road network.

CHOATE ROAD BRIDGE & GANARASKA RIVER BRIDGE

CHOATE ROAD BRIDGE & GANARASKA RIVER BRIDGE ENVIRONMENTAL CONDITIONS

Social/Cultural Environment

Archaeology

- Lands adjacent to the bridges do not contain archaeological significance.

Cultural Heritage

- Choate Road and Ganaraska River bridges are not culturally significant.
- There are multiple designated built heritage resources including the Molson Mill.
- The lands directly north and south of Choate Road are Cultural Heritage Landscapes.

Land Use

- Surrounding land uses include the Port Hope Conservation Area, Corbett's Dam Public Area and Fish Ladder, Grace Church, as well as agricultural, natural environment, and residential uses.

Natural Environment

Terrestrial

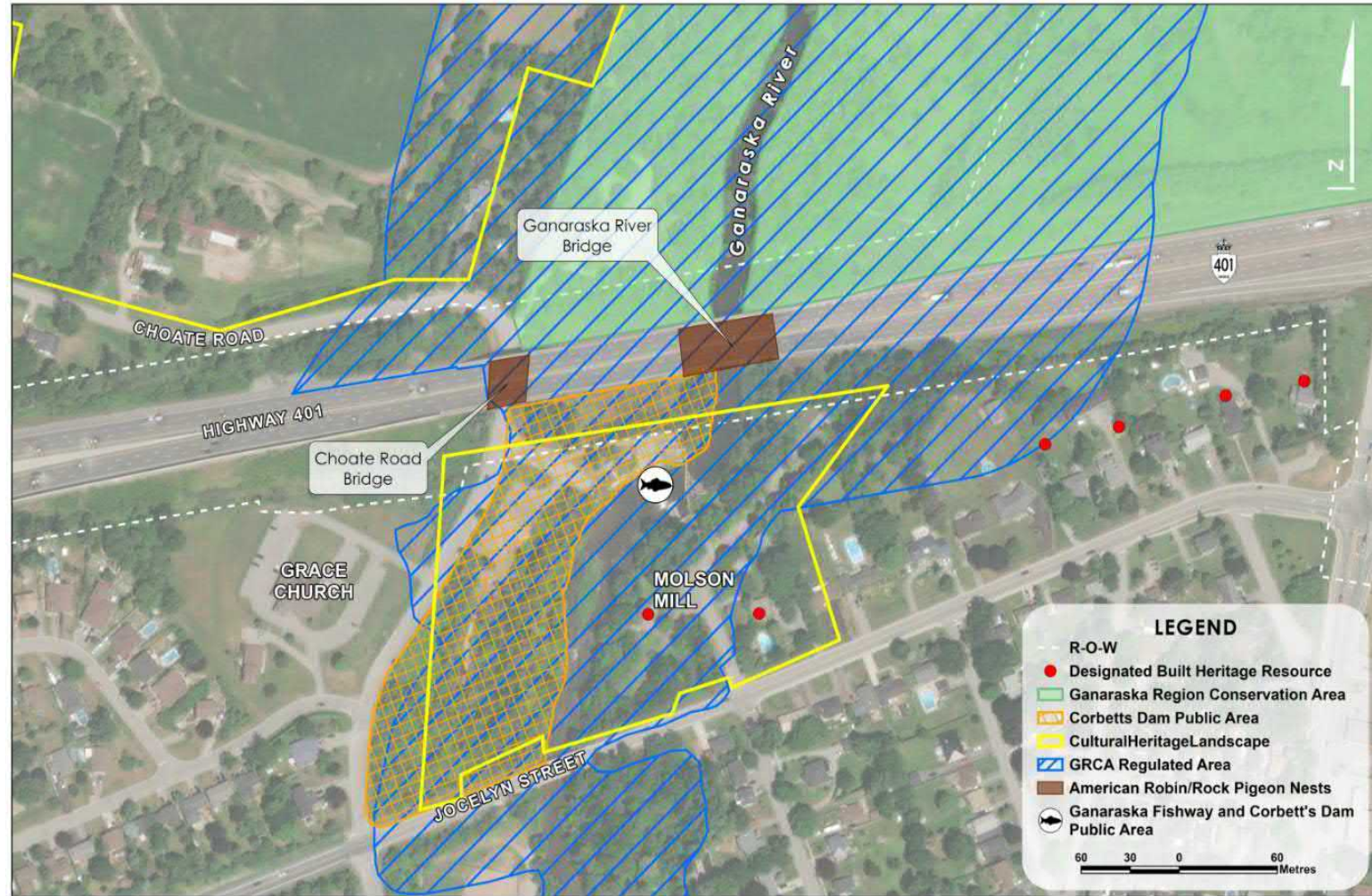
- Migratory bird nesting (American Robin and Rock Pigeon) observed on the bridges.

Fisheries

- Ganaraska River contains Pacific and Atlantic Salmon, Char and cool water sportfish and baitfish species.

Floodplain

- The existing Choate Road is within the floodplain limits



**The GRCA Regulation Limit is used here to show the general extent of the Regulatory flood plain, however, it also includes a 15m buffer beyond the largest regulated hazard*

Existing Vehicular Traffic Volumes:

- Traffic volumes for vehicles, pedestrians and cyclists were observed from June 18 to 24, 2020 at Choate Road, just north of Highway 401.
 - Average daily traffic (ADT) ~ 500 vehicles.
 - Given only ~30-40 houses located on Choate Road north of 401, most of this traffic is likely to be cut-through.

Direction	Daily
Northbound	240
Southbound	260
Total	500

Existing Pedestrian and Cyclist Volumes:

User	Daily
Pedestrians	6
Cyclists	9

**All Alternatives in the following slides maintain active transportation facilities through this corridor.*

CHOATE ROAD BRIDGE & GANARASKA RIVER BRIDGE LONG LIST ALTERNATIVES

1 Replace both Choate Road and Ganaraska River Bridges (Carried Forward)



Advantages:

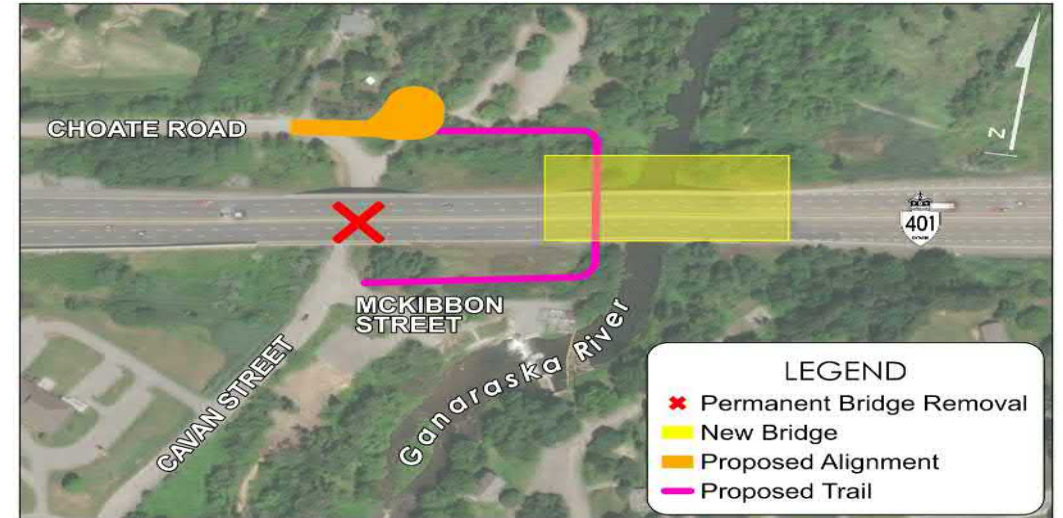
- No property required.
- Low impact to existing transportation network.
- Minor change to existing footprint resulting in negligible impact to flood plain and natural environment.

Disadvantages:

- High complexity construction staging and traffic delays.
- High construction and maintenance cost with two (2) bridges.

Rationale: Maintains existing functional use of existing road network with low impacts to the flood plain and requires no property.

2 Terminate Choate Road with a Cul-De-Sac, Terminate Cavan Street at McKibbon Street, Replace Ganaraska River Bridge (Carried Forward)



Advantages:

- Simple and shorter construction.
- Reduced costs with only one (1) bridge.

Disadvantages:

- Property required from Ganaraska River Conservation Authority and residents.
- High impact to existing transportation network.
- Impacts to the Cultural Heritage Landscape south of the bridges.
- Largest impact to flood plain due to change in existing footprint

Rationale: Replaces one bridge with simple construction staging that will minimize delays to public on Highway 401 with low impacts to the flood plain.

Closure of Choate Road at the Highway 401 Crossing

- Permanently divert traffic to Cranberry Road
- Vehicles travelling east of Ontario Street may divert to Dale Road and then to Ontario Street.

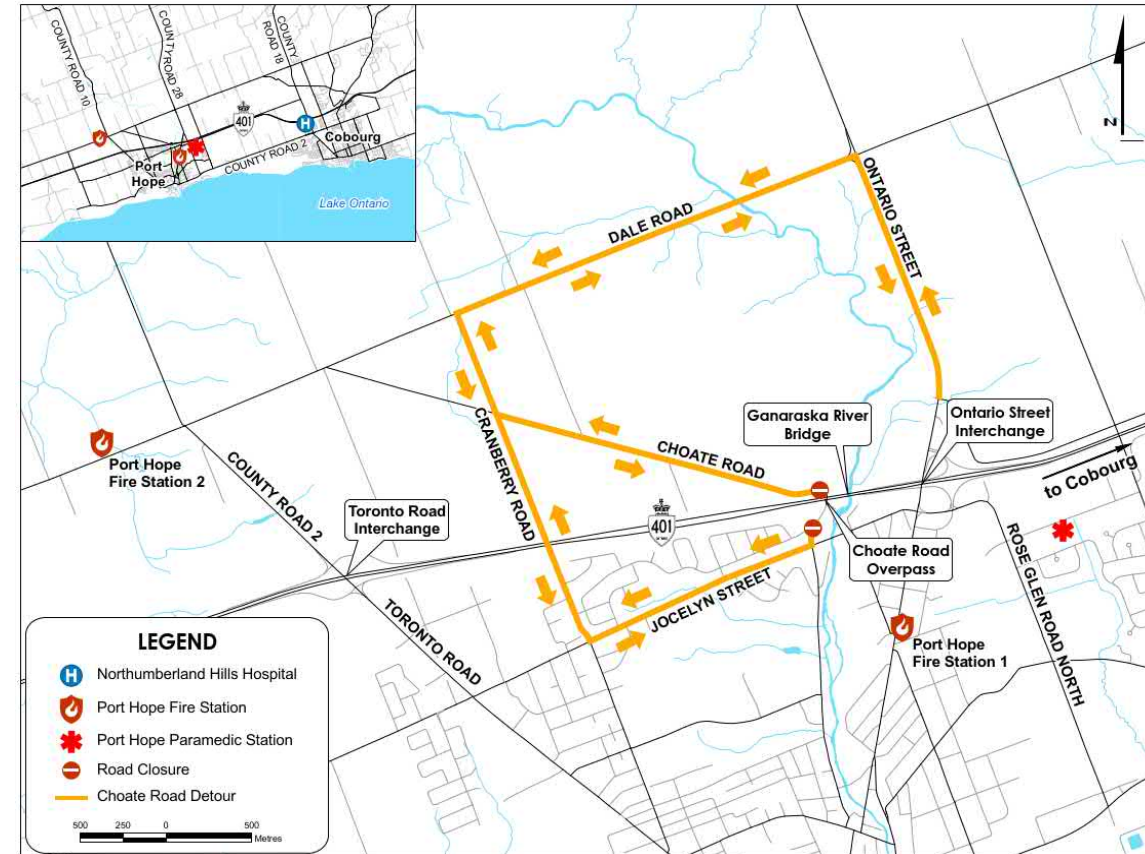
Permanent Impacts to Local Traffic (30-40 residences north of Highway 401)

- 4.5 additional kms
- 5 additional travel minutes (worst case)

Permanent Impacts to Emergency Services

- Up to five (5) minutes additional travel time for emergency services anticipated.
- Actual impacts will vary depending on availability / proximity of emergency services.

Destination	Existing Travel Time	Diverted Travel Time	Delay	Detour Route
Northumberland Hills Hospital	9 min; 10.2 km	13 min; 15.7 km	4 mins	Dale, Ontario
Port Hope Paramedic Station	3 min; 1.8 km	8 min; 6.2 km	5 mins	Cranberry
Port Hope Fire Station No. 1	2 min; 1.3 km	7 min; 5.8 km	5 mins	Cranberry
Port Hope Fire Station No. 2	5 min; 4.4 km	5 min; 4.4 km	0 mins	None



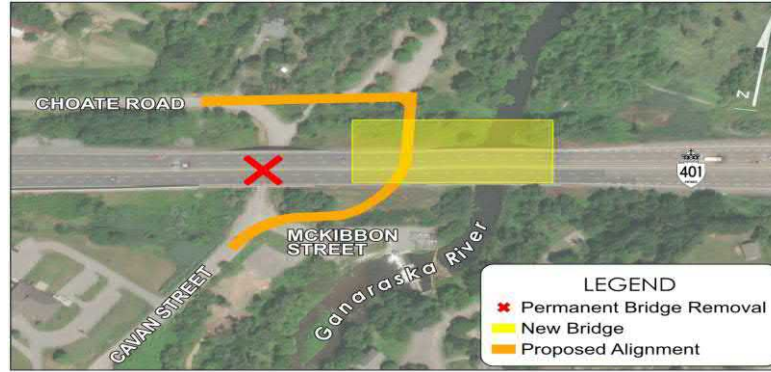
****We would appreciate hearing from you to understand your perspective on the closure of Choate Road to aid us in the determination of the recommended solution for this location.***

CHOATE ROAD BRIDGE & GANARASKA RIVER BRIDGE LONG LIST ALTERNATIVES

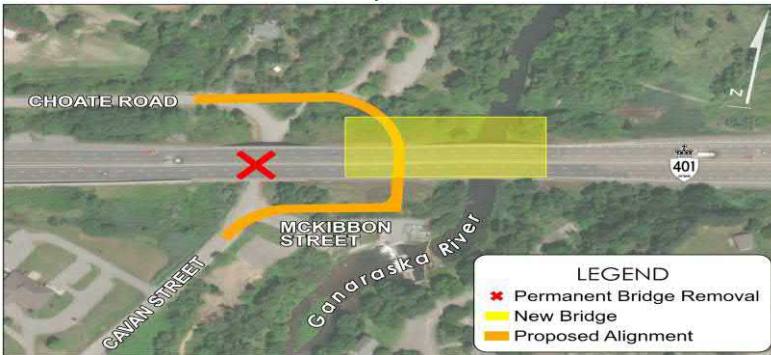
3a Replace Ganaraska River Bridge and Realign Choate Road with a Curved Alignment Carried Forward



3b Replace Ganaraska River Bridge and Realign Choate Road with a T- intersection to the North Carried Forward



3c Replace Ganaraska River Bridge and Realign Choate Road with a T-intersection to the South Carried Forward



3d Replace Ganaraska River Bridge and Realign Choate Road with a Tangent Alignment Carried Forward



Advantages:

- Simple construction staging.
- Low impact to existing transportation network.
- Replacing one (1) bridge only.

Disadvantages:

- Permanent property required.
- Retaining wall required north and south of the right-of-way.
- Realignment of municipal road.
- Potential impacts to the Cultural Heritage Landscape south of the bridges for access and parking.
- Larger change to footprint resulting in higher impact to flood plain and natural environment.

Rationale: Realignment maintains existing functional use of existing road network with replacing one (1) bridge and requires simple construction staging that will minimize public delays on Highway 401 during construction.

SUMMARY - SHORT LIST ALTERNATIVES



Cranberry Road Bridge

Alternative **1** – Replacement on Existing Alignment – Staged Traffic.

Alternative **2** – Replacement on Existing Alignment – Full Closure.



Choate Road Bridge & Ganaraska River Bridge

Alternative **1** – Replace Both Choate Road and Ganaraska River bridges in place.

Alternative **2** – Terminate Choate Road; Replace Ganaraska River bridge.

Alternative **3a, 3b, 3c, 3d** – Realign Choate Road under Ganaraska River bridge.



Highway 401 Future Footprint

To be determined for PIC #2.

The project is being split into two separate EA studies:

STUDY # 1 GWP 4005-17-00 includes structural needs of 3 bridges (Cranberry Road Bridge, Choate Road Bridge and Ganaraska River Bridge) and establishing the eight (8) and ten (10) lane future footprint of Highway 401 from 500m west of Cranberry Road to 450m east of County Road 28 (Ontario Street).

- PIC 1 (present short list of alternatives) Summer 2021
- PIC 2 (present Technically Preferred Alternative) Fall 2021
- File TESR for public review Spring 2022

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- PIC 2 (present TPA) Winter 2022
- File TESR for Public Review Spring 2022

IF YOU WOULD LIKE MORE INFORMATION, PLEASE CONTACT:

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Consultant Project Manager
McIntosh Perry Consulting Engineers
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Toll free: 1-888-348-8991
Email: l.donaldson@mcintoshperry.com

Mr. Chris Teepell, C.E.T
MTO Project Manager
Ministry of Transportation – Project Delivery East
Phone: 613-583-3109
Email: Chris.Teepell@ontario.ca

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STUDY #1 GWP 4005-17-00

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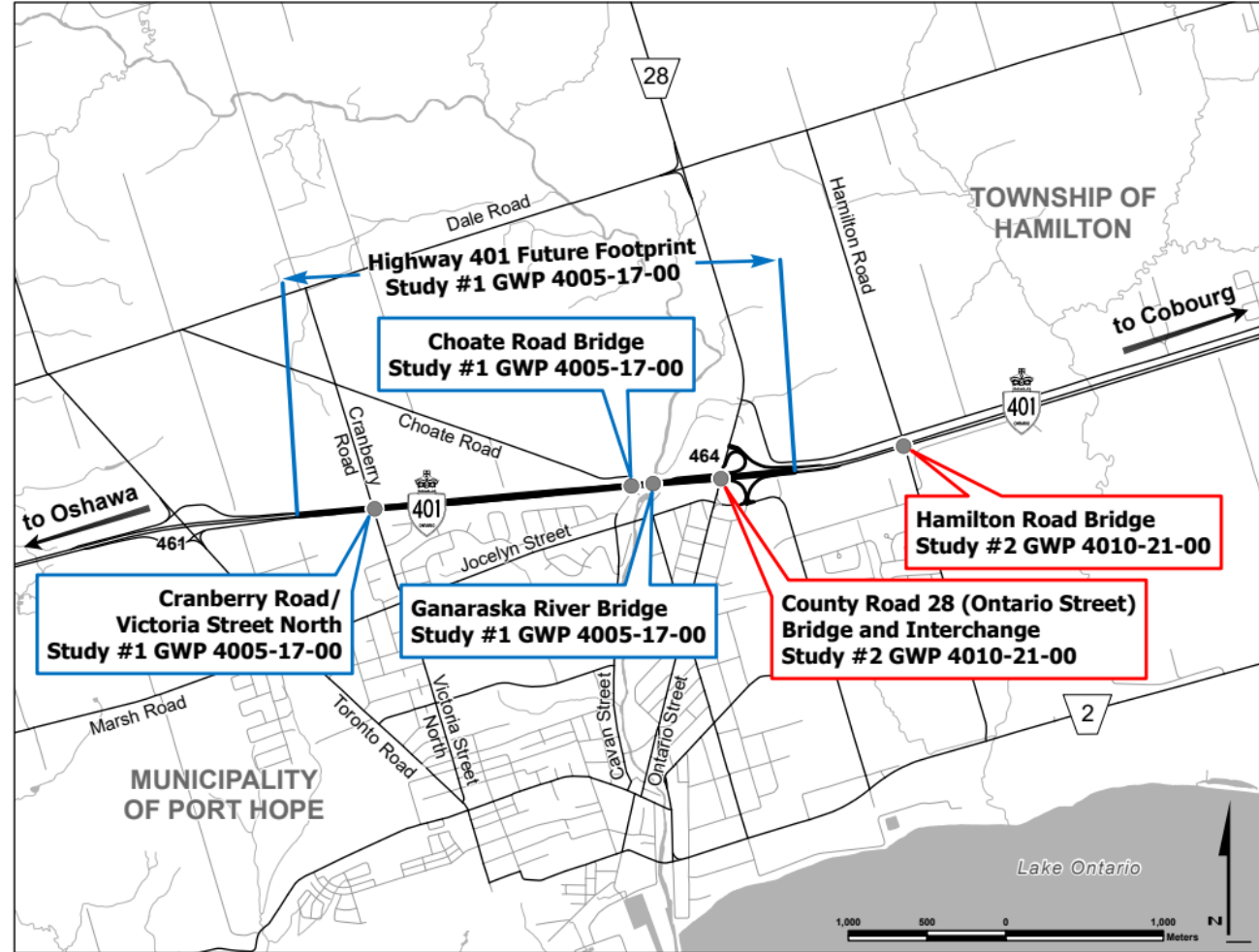
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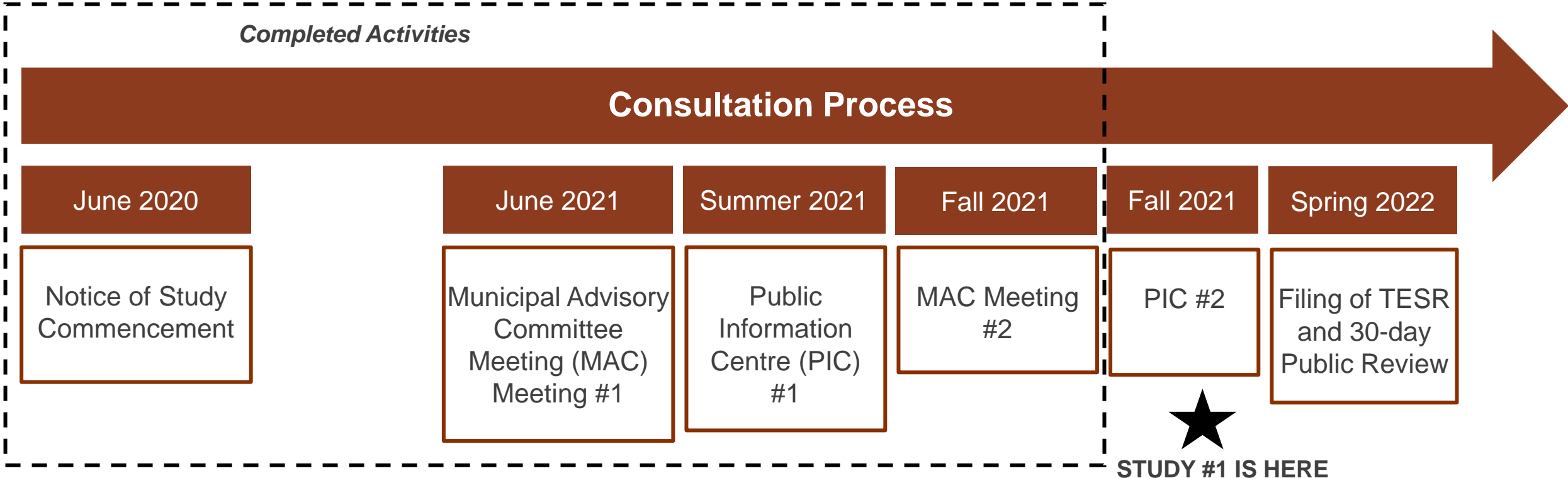
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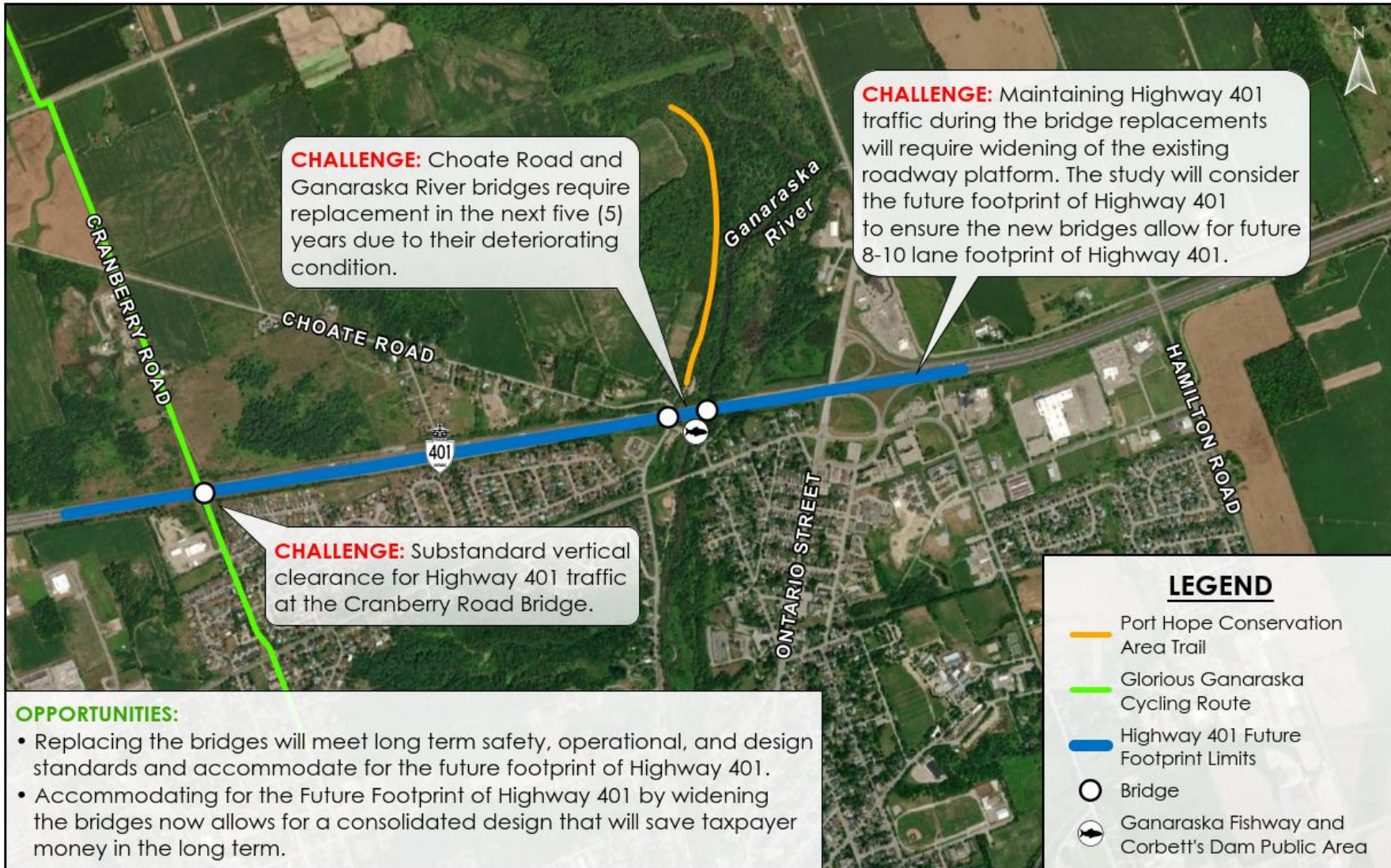
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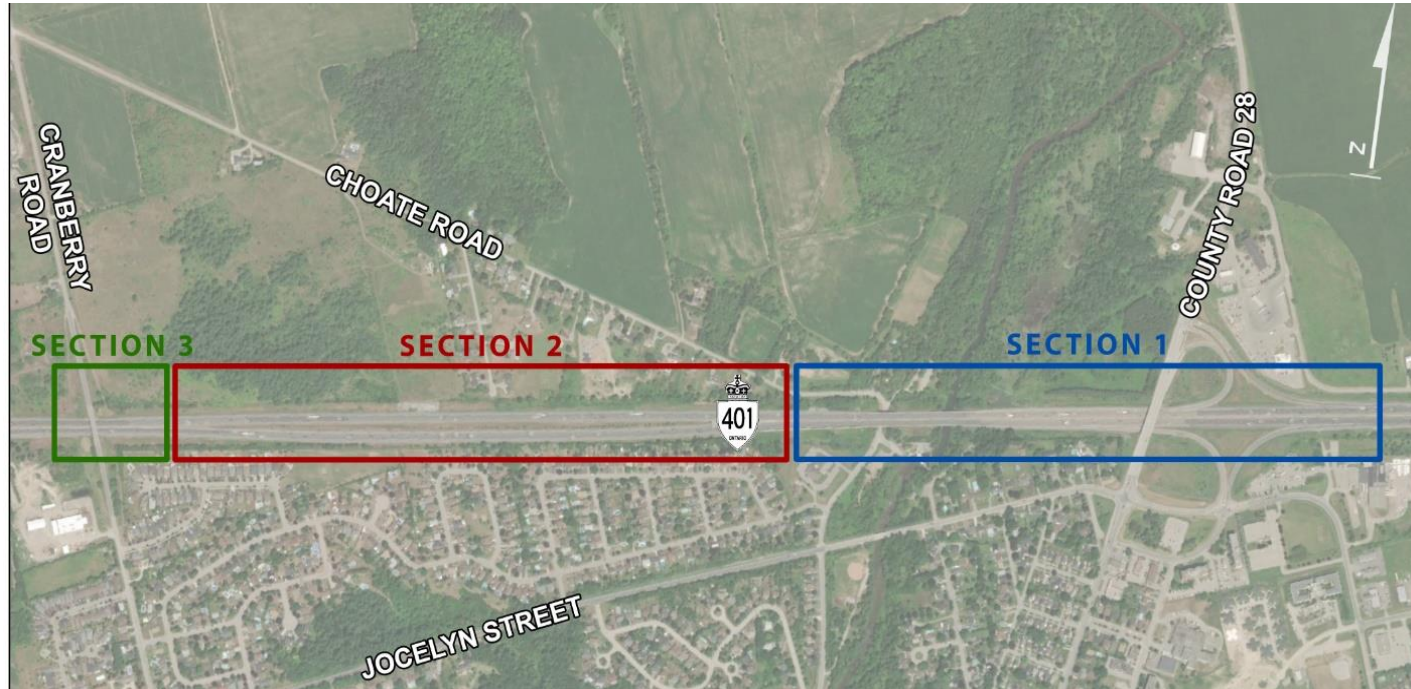
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HIGHWAY 401 FUTURE FOOTPRINT

HIGHWAY 401 – 3 SECTIONS

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- Paved median and tall wall barrier.
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- Cultural heritage resources including buildings and landscapes located north and south of the highway.

3 alternatives were considered for each Section for the Highway 401 future footprint:

- 1 Extend Highway 401 fully to the north
- 2 Split the extension for each direction of Highway 401
- 3 Extend Highway 401 fully to the south

RECOMMENDED PLAN

Section	Description	Recommended Alternative	Rationale
1	East of County Road 28 west of Choate Road (1.2 km)	Alternative 1 - Extend to the North	<ul style="list-style-type: none"> ✓ Minimizes permanent residential property impacts ✓ Avoid impacts to existing noise barrier ✓ Minimizes environmental impacts, especially to Corbett's dam (fish ladder) ✓ Most cost-efficient option ✓ Least overall noise impacts
2	West of Choate Road and westerly to east of Cranberry Road (1.3 km)	Alternative 1 - Extend to the North	<ul style="list-style-type: none"> ✓ Minimizes permanent residential property impacts ✓ Avoid impacts to existing noise barrier ✓ Most cost-efficient option ✓ Least overall noise impacts
3	East of Cranberry Road to west of Cranberry Road (0.2 km)	Alternative 2 - Extend to the North and South	<ul style="list-style-type: none"> ✓ No permanent property impacts ✓ Low staging complexity ✓ Most cost-efficient option ✓ Least overall noise impacts

RECOMMENDED PLAN

Section 1 and 2: Extend Highway 401 on the north side only to accommodate 4 lanes in each direction from west of Choate Road to east of Cranberry Road

- The centreline of both the westbound and eastbound lanes will be realigned to the north.
- Minor amount of agricultural land/private property may be required during construction and permanently.
- Modify the alignment of the Country Road 28 (Ontario Street) on-ramp to Highway 401 westbound (to facilitate the mainline lane shifts to the north).
- Enhance the drainage system to accommodate the future footprint.
- Retain the existing vertical geometry

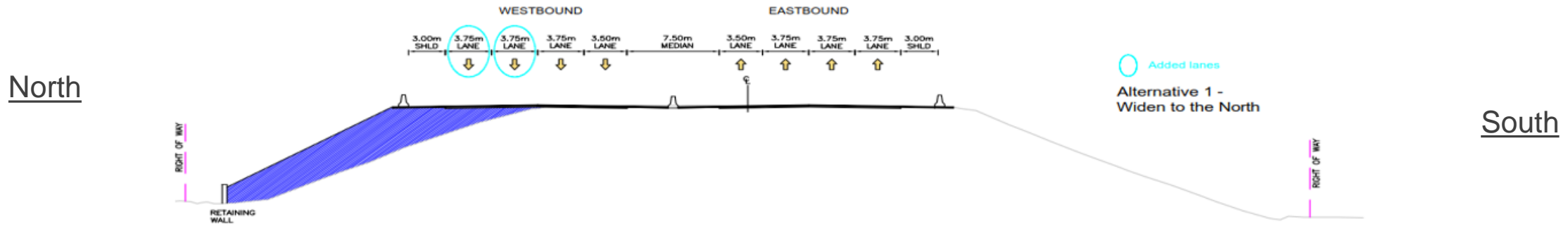
Section 3: Extend Highway 401 equally to the north and south to accommodate 4 lanes in each direction from east of Cranberry Road to west of Cranberry Road

- Retain the existing horizontal and vertical geometry
- Enhance the drainage system to accommodate the proposed future footprint

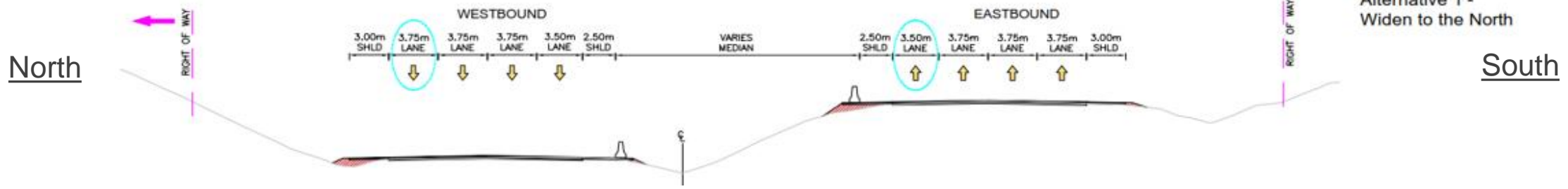


RECOMMENDED PLAN

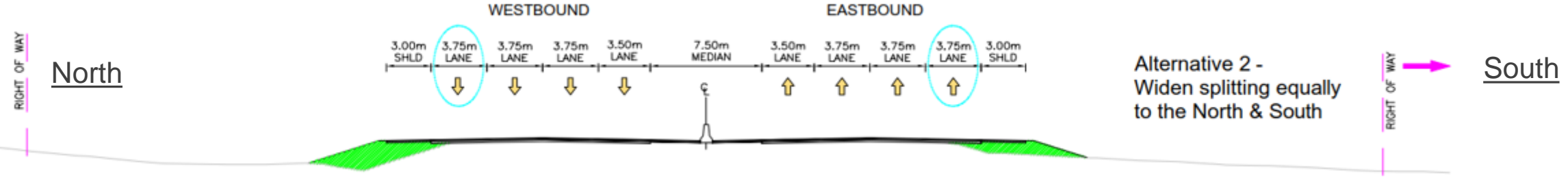
Section 1 Recommended Plan: Expand Highway 401 Fully to the North



Section 2 Recommended Plan: Expand Highway 401 Fully to the North



Section 3 Recommended Plan: Split the expansion for each direction of Highway 401 (both north and south)



Minor potential permanent property required for the Highway 401 Future Footprint north of Highway 401 in Section 2 at one (1) agricultural/residential property



CRANBERRY ROAD BRIDGE

CRANBERRY ROAD BRIDGE EXISTING ENVIRONMENTAL CONDITIONS

Social and Cultural Environment

Archaeology

- Lands adjacent to the Cranberry Road bridge do not contain archaeological significance.

Cultural Heritage

- The Cranberry Road bridge is not a heritage bridge.

Land Use

- Lands surrounding the Cranberry Road bridge are agricultural, institutional and residential.

Natural Environment

- SAR bird (Eastern Meadowlark) was observed.
- No watercourses are found within the vicinity of the Cranberry Road bridge.



Existing Vehicular Traffic Volumes:

- Traffic volumes for vehicles, pedestrians and cyclists were observed from June 18 to 21, 2020 at Cranberry Road, just north of Highway 401.
 - Average daily traffic (ADT) ~ 1,100 vehicles.

Direction	Daily
Northbound	470
Southbound	640
Total	1,110

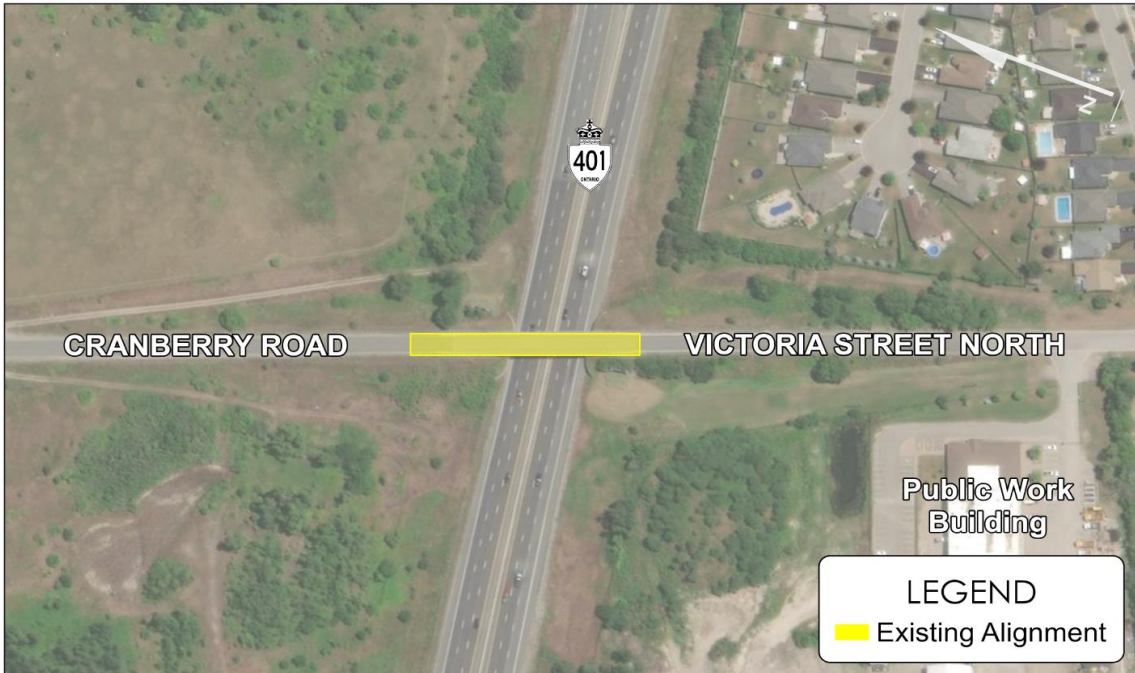
Existing Pedestrian and Cyclist Volumes:

- Per the County of Northumberland Master Plan, Cranberry Road is designated as part of the Glorious Ganaraska Cycling Loop, a 30km scenic cycling route through Port Hope.

User	Daily
Pedestrians	7
Cyclists	32



CRANBERRY ROAD BRIDGE SHORT LIST ALTERNATIVES

1 Replacement on Existing Alignment Staged Traffic (Carried Forward) ✓



2 Replacement on Existing Alignment Full Closure (Carried Forward) ✓



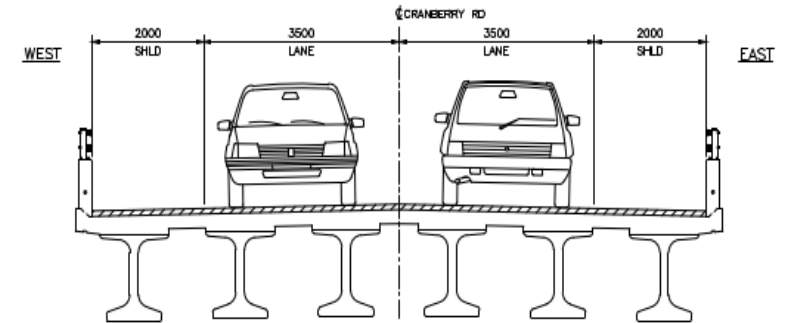
Criteria	Alternative # 2 Staged Traffic 	Alternative # 3 Full Closure 
Environmental	<i>Neutral</i>	
Transportation	<ul style="list-style-type: none"> ✓ No additional travel time during construction ✓ No delay to emergency services response time 	<ul style="list-style-type: none"> ✗ Maximum 7.5 km additional travel distance for local traffic (during construction) ✗ Maximum 3 min delay for EMS (temporary, during construction)
Constructability	<ul style="list-style-type: none"> ✗ 2 construction seasons ✗ Multiple construction staging setups 	<ul style="list-style-type: none"> ✓ 1 construction season ✓ One staging set up and take down
Cost	✗ Highest cost	✓ Lowest cost
Recommendation	Not Recommended	Recommended

RECOMMENDED PLAN

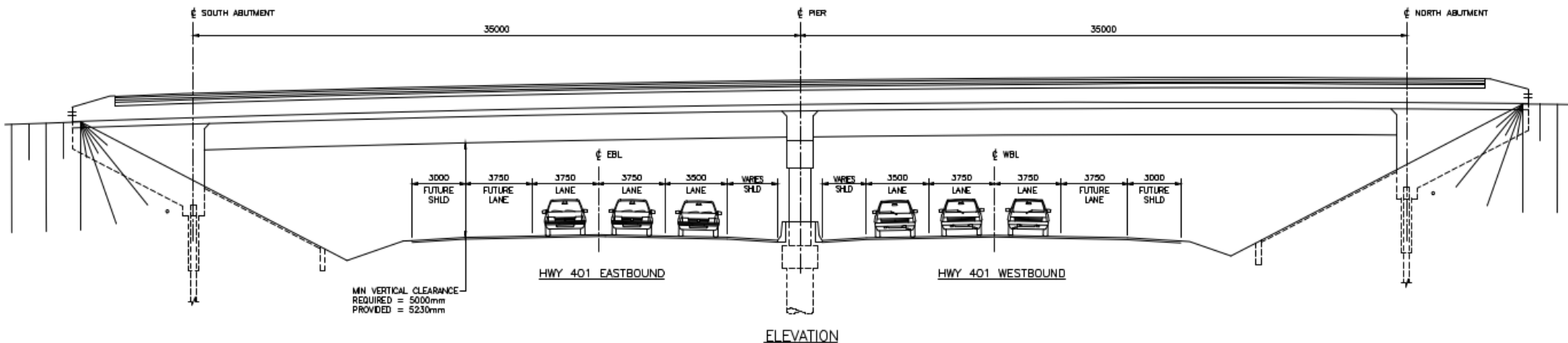
The Recommended Alternative is to replace the bridge in the same location as the existing bridge with a full closure (Alternative 2):

- The new bridge will provide one lane of traffic in each direction for Cranberry Road and will span to allow for the potential 8-10 laning of Highway 401.
- A ~1.0 m profile raise will be required on Cranberry Road.
- 2.0 m paved shoulders to support the Glorious Ganaraska Cycling Loop

Cranberry Road Cross Section over Highway 401



Highway 401 Cross Section under Cranberry Road



Full closure of Cranberry Road is required for the duration of construction (one full season).

- Detour Length: 7.5 km
- The detour will utilize Dale Road, County Road 2, and Jocelyn Street

Full closure of Highway 401 is required to facilitate the demolition of the existing bridge

- The detour will be in place for 2-3 nights on Friday and Saturday nights (weekend closures)
- The detour will redirect traffic onto the Emergency Detour Route (EDR), which utilizes the County Road 2 (Toronto Road) interchange to the west and County Road 28 (Ontario Street) interchange to the east.



CHOATE ROAD BRIDGE & GANARASKA RIVER BRIDGE

Social/Cultural Environment

Cultural Heritage

- Multiple designated built heritage resources on south side of Hwy 401.
- Lands directly north and south of Choate Road are Cultural Heritage Landscapes.

Land Use

- Port Hope Conservation Area, Corbett's Dam Public Area and Fish Ladder.

Archaeology

- Potential archaeological resources near CR28 interchange currently undergoing assessment

Natural Environment

Terrestrial

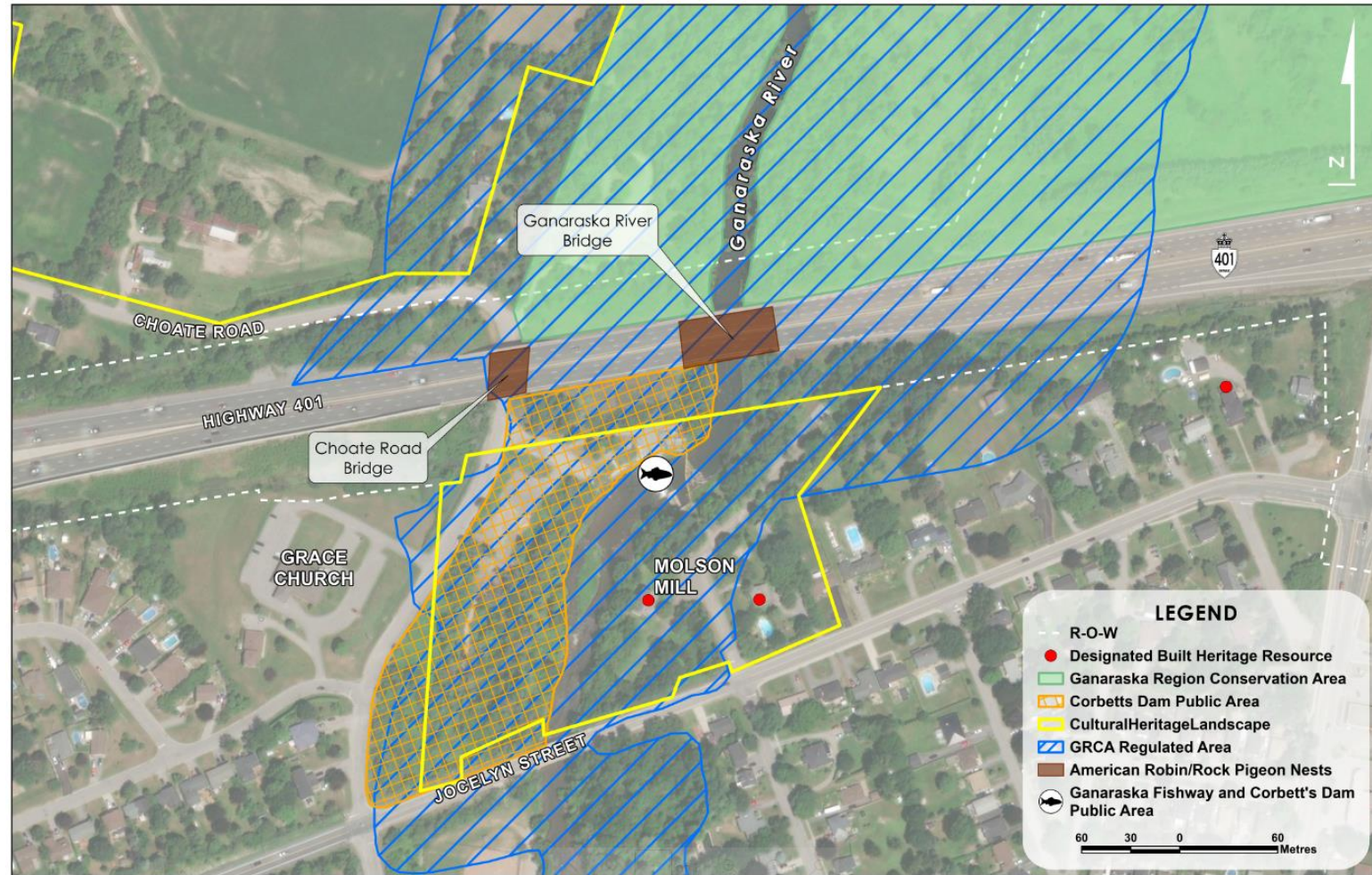
- Migratory bird nesting observed on the bridge.

Fisheries

- Ganaraska River contains cool water sportfish and baitfish species

Floodplain

- The existing Choate Road is within the floodplain limits.



**The GRCA Regulation Limit is used here to show the general extent of the Regulatory flood plain, however, it also includes a 15m buffer beyond the largest regulated hazard*

Existing Vehicular Traffic Volumes:

- Traffic volumes for vehicles, pedestrians and cyclists were observed from June 18 to 24, 2020 at Choate Road, just north of Highway 401.
 - Average daily traffic (ADT) ~ 500 vehicles.
 - Given only ~30-40 houses located on Choate Road north of 401, most of this traffic is likely to be cut-through.

Direction	Daily
Northbound	240
Southbound	260
Total	500

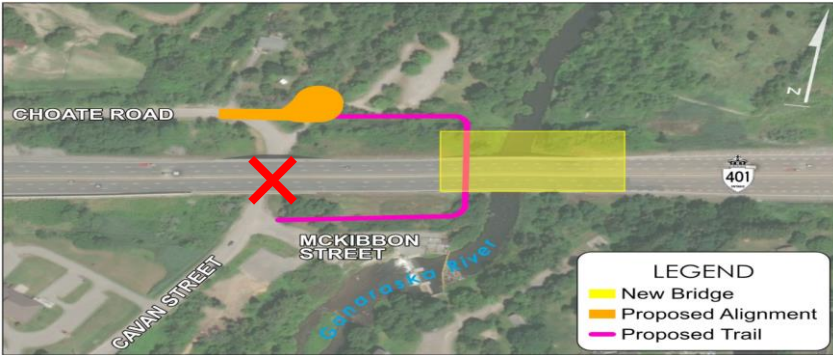
Existing Pedestrian and Cyclist Volumes:

User	Daily
Pedestrians	6
Cyclists	9



Alternative # 1 – Maintain Choate Road Overpass and Replace Both Bridges

Maintains the municipal transportation corridor.



Alternative # 2 – Terminate Choate Road with a pedestrian trail under replaced Ganaraska River Bridge

Eliminates the municipal transportation corridor. +5 minute travel time to approximately 40 residents on Choate Road north of Highway 401. Mild increase (~5 minute) to EMS response times.






Alternative # 3 (A, B, C, D) – Realign Choate Road under Ganaraska River Bridge (4 sub-options)

Ganaraska River bridge is replaced with a longer bridge. Realignment of Choate Road would require buy-in from the Municipality of Port Hope.



EVALUATION OF ALTERNATIVES

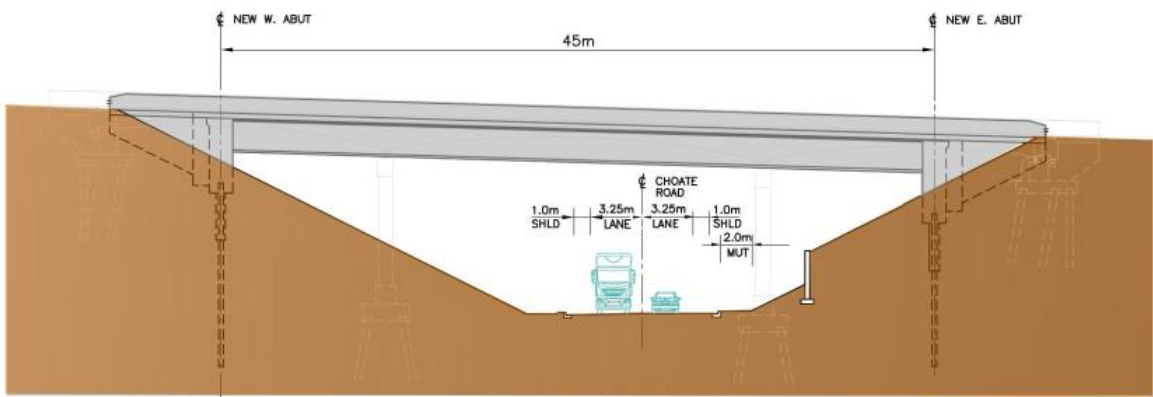
Criteria	Alternative # 1 Maintain Both Bridges 	Alternative # 2 Terminate Choate Road 	Alternative # 3 Realign Choate Road under Ganaraska River Bridge 
Natural Environment	<ul style="list-style-type: none"> ✓ Largest span opening for floodplain ✓ Smallest impact to wildlife habitat 	<ul style="list-style-type: none"> × Smallest span opening for floodplain × Large impacts to the floodplain 	<ul style="list-style-type: none"> × Largest impact to wildlife habitat (GRCA lands) × Largest impacts to the floodplain
Property Impacts	<ul style="list-style-type: none"> ✓ Least property requirements 	<ul style="list-style-type: none"> × Moderate permanent property required 	<ul style="list-style-type: none"> × Largest permanent property required
Transportation	<ul style="list-style-type: none"> × Lane closures for 5 construction seasons ✓ No permanent increase to travel times for local road traffic ✓ No impacts to EMS response distances 	<ul style="list-style-type: none"> ✓ Lane closures for 3.5 seasons × 5 km permanent increase in travel time to 40+ residences × 4.5km additional travel distance for EMS response times (ambulance and fire) 	<ul style="list-style-type: none"> ✓ Lane closures for 3.5 seasons ✓ No permanent increase to local road traffic ✓ No impacts to EMS response distances
Constructability	<ul style="list-style-type: none"> × Longest construction duration (4.5 years) × Highly complex staging 	<ul style="list-style-type: none"> ✓ Shorter construction duration (3.5 years) ✓ Low complexity 	<ul style="list-style-type: none"> ✓ Shorter construction duration (3.5 years) ✓ Low to moderate complexity
Cost	<ul style="list-style-type: none"> × Highest cost × 2 bridges to maintain in future 	<ul style="list-style-type: none"> ✓ Lowest cost ✓ Single bridge to maintain 	<ul style="list-style-type: none"> × Higher cost ✓ Single bridge to maintain
Recommendation	Recommended	Not Recommended	Not Recommended

RECOMMENDED PLAN

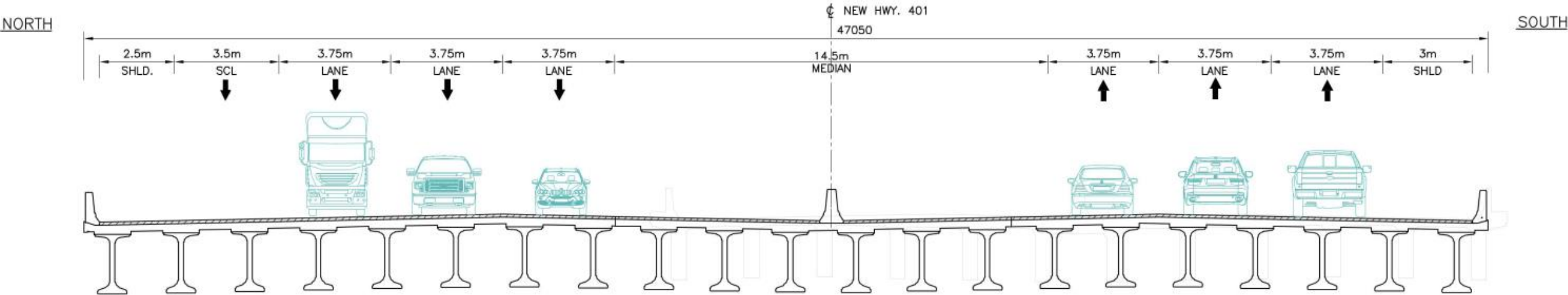
Choate Road Overpass

- 45 m three-span bridge
- 2.0m Multi Use Path provided for Ganaraska Hiking Trail
- Bridge will be built to accommodate the future footprint of Highway 401

Choate Road Cross Section under Highway 401



Highway 401 Cross Section over Choate Road

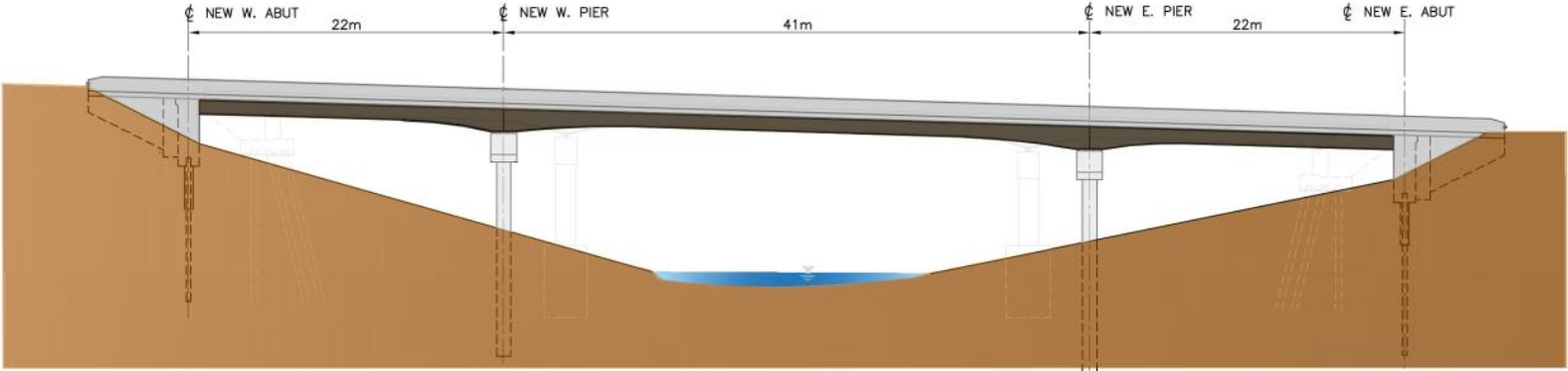


RECOMMENDED PLAN

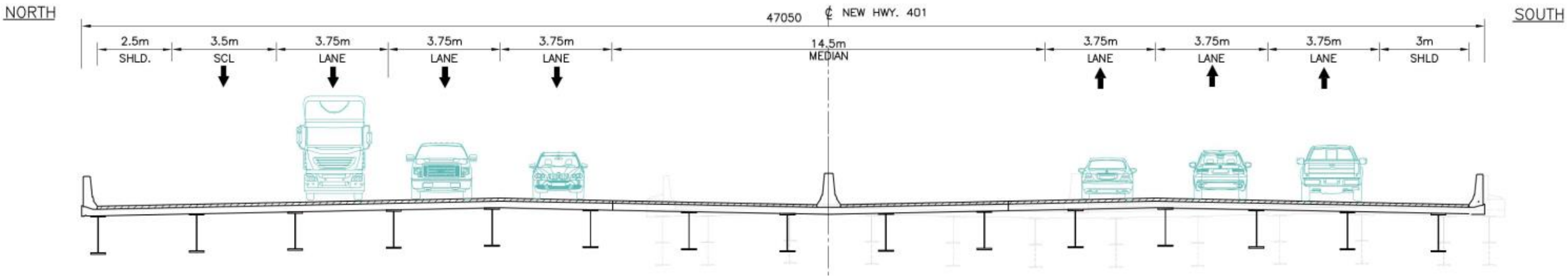
Ganaraska River Bridge

- 93 m three-span (24m, 45m, 24m) bridge
- Bridge will be built to accommodate the Future Footprint of Highway 401

Ganaraska River Cross Section under Highway 401



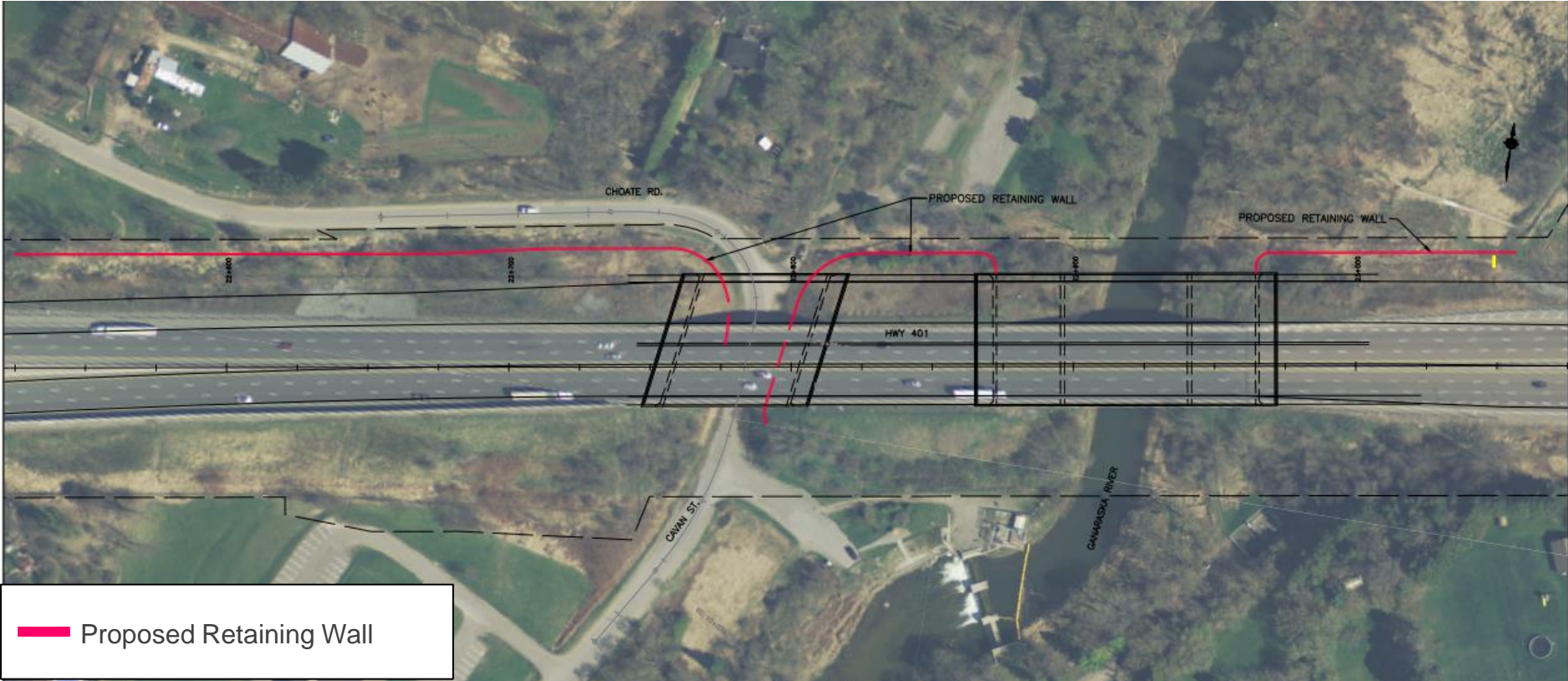
Highway 401 Cross Section over Ganaraska River



RECOMMENDED PLAN

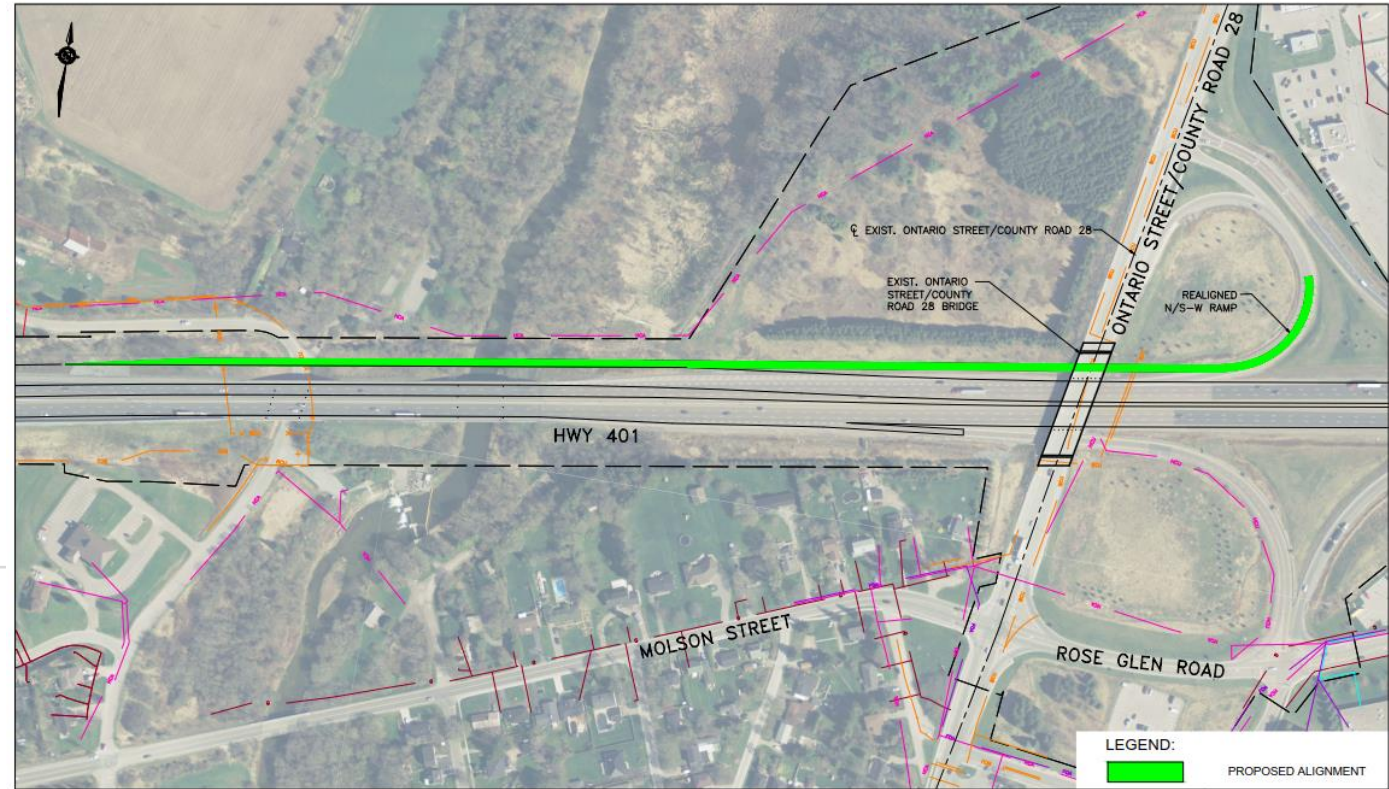
Retaining Walls

- North side of Westbound Lanes
 - 65 m long wall between both Choate Road and Ganaraska River bridges
 - 200 m long wall west of Choate Road (6+m high)
 - 100 m long wall east of Ganaraska River (3+m high)



RECOMMENDED PLAN

- Construction staging for the replacement of Choate/Ganaraska bridges requires lane shifts on Highway 401
- To facilitate lane shifts, relocation of the WB on-ramp at County Road 28 interchange to the north span of the CR28 bridge is required.



CHOATE ROAD DETOUR

Choate Road closures will be required during the construction of the Choate Road structure.

During the closures, traffic will be diverted to Cranberry Road

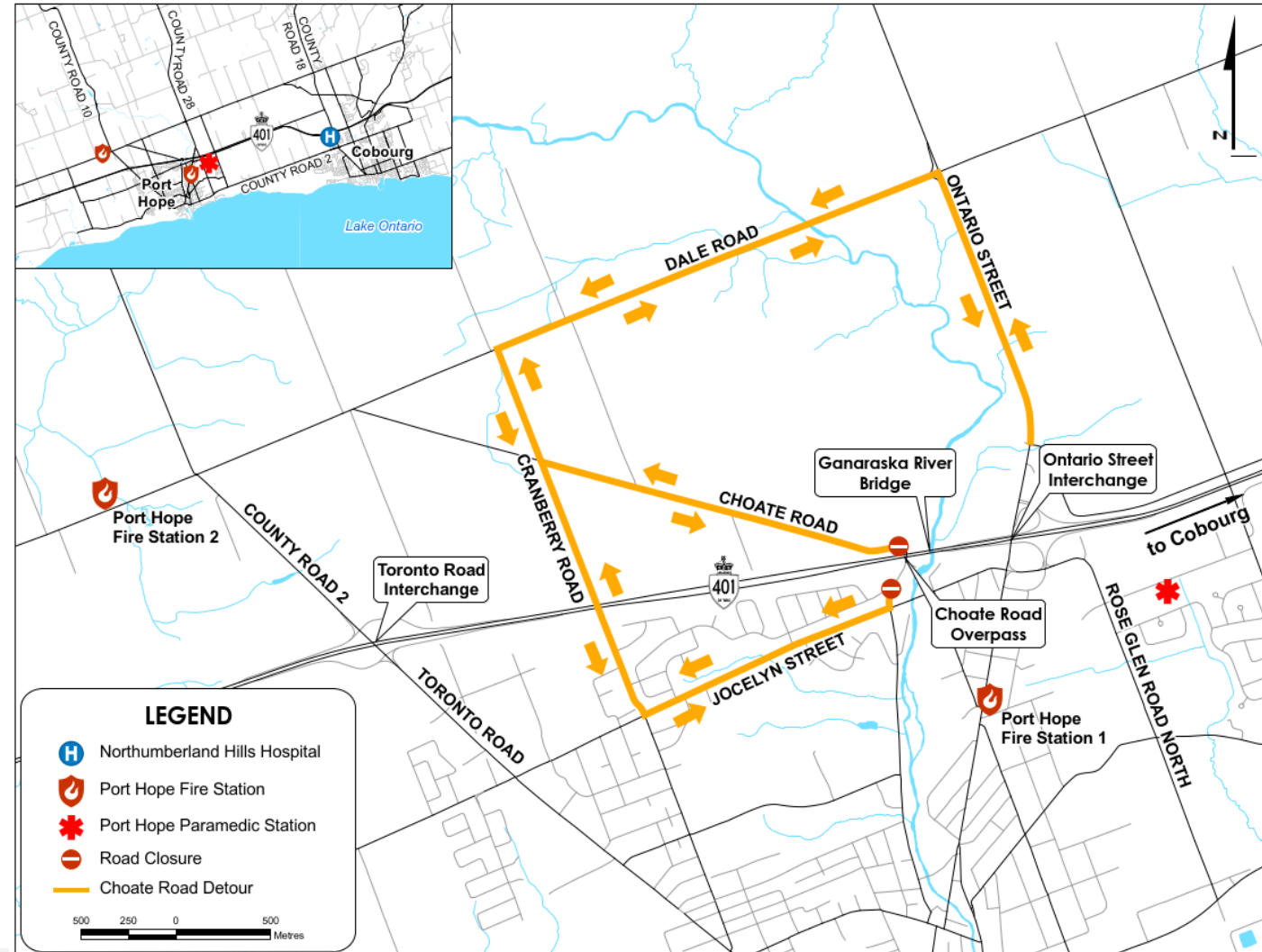
- Vehicles travelling east of Ontario Street may divert to Dale Road and then to Ontario Street.

Impacts to Local Traffic:

(30-40 residences north of Highway 401)

- 4.5 additional kms
- 5 additional travel minutes (worst case)

Full closure of Highway 401 is not anticipated. Short duration, single lane closures will be required on Highway 401 during construction



Potential property is required on the north side of Highway 401 west of Choate Road to facilitate the construction staging for the replacement of Choate Road and Ganaraska River

- Maximum 15 m outside of existing Right-Of-Way



LEGEND:

- EXISTING MTO RIGHT OF WAY
- POTENTIAL PROPERTY REQUIRED (TEMPORARY)

RECOMMENDED PLAN RECAP



Highway 401 – Future Footprint

- Section 1 (east) – Expand to the north
- Section 2 (middle) – Expand to the north (each direction)
- Section 3 (west) – Split extension to outside



Choate Road / Ganaraska River Bridges

Alternative # 1 – Maintain and Replace Both Bridges



Cranberry Road Underpass

Alternative # 3 – Replacement on Existing Alignment – Full Closure

SCHEDULE

The project has been split into two separate EA studies to accelerate the project schedule for the Choate Road and Ganaraska River Bridges (**Study 1**) due to the deteriorating condition of these structures.

As a result, preliminary design for County Road 28 interchange and Hamilton Road bridge (**Study 2**) is being presented as part of a separate consultation process once complete.

Study 1: Highway 401 & Cranberry, Choate, Ganaraska Bridges

- PIC 2 (present TPA) Winter 2021/2022
- File TESR for public review Winter/Spring 2022

Study 2: County Road 28 Interchange & Hamilton Road Bridge

- PIC 1 (present short list) Winter/Spring 2022
- PIC 2 (present TPA) To Be Determined
- File TESR for Public Review To Be Determined

IF YOU WOULD LIKE MORE INFORMATION, PLEASE CONTACT:

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For more information, please visit the project website at:

www.Hwy401PortHopeEA.com