

Inventory Data:	
Structure Name	<span style="border: 1px solid black; padding: 2px;">#40 Ross Bridge, Lot 10/11, Conc. I, Elzevir</span>
Main Hwy/Road#	<span style="border: 1px solid black; padding: 2px;"></span> On <input checked="" type="checkbox"/> Under <input type="checkbox"/> Crossing Type <input type="checkbox"/> Navig. Water Rail <input type="checkbox"/> Road <input type="checkbox"/> Non-Navig. Water Ped. <input type="checkbox"/> Other <input type="checkbox"/>
Hwy/Road Name	<span style="border: 1px solid black; padding: 2px;">Bosley Road</span>
Structure Location	<span style="border: 1px solid black; padding: 2px;">1.80 km W of Queensborough Road</span>
Latitude	<span style="border: 1px solid black; padding: 2px;">44.577672°N</span> Longitude <span style="border: 1px solid black; padding: 2px;">77.394569°W</span>
Owner(s)	<span style="border: 1px solid black; padding: 2px;">Municipality of Tweed</span> Heritage Designation: Not Cons. <input checked="" type="checkbox"/> Cons./not App. <input type="checkbox"/> List/not Desig. <input type="checkbox"/> Desig./not List <input type="checkbox"/> Desig. & List <input type="checkbox"/>
MTO Region	<span style="border: 1px solid black; padding: 2px;">Eastern</span> Road Class: Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<span style="border: 1px solid black; padding: 2px;">Kingston</span> Posted Speed <span style="border: 1px solid black; padding: 2px;">80</span> No. of Lanes <span style="border: 1px solid black; padding: 2px;">1</span>
Old County	<span style="border: 1px solid black; padding: 2px;"></span> AADT <span style="border: 1px solid black; padding: 2px;"></span> % Trucks <span style="border: 1px solid black; padding: 2px;"></span>
Geographic Twp.	<span style="border: 1px solid black; padding: 2px;"></span> Inspection Route Sequence <span style="border: 1px solid black; padding: 2px;"></span>
Structure Type	<span style="border: 1px solid black; padding: 2px;">T-Beam</span> Interchange Number <span style="border: 1px solid black; padding: 2px;"></span>
Total Deck Length	<span style="border: 1px solid black; padding: 2px;">13.0</span> (m) Interchange Structure Number <span style="border: 1px solid black; padding: 2px;"></span>
Overall Str. Width	<span style="border: 1px solid black; padding: 2px;">5.8</span> (m) Min. Vertical Clearance <span style="border: 1px solid black; padding: 2px;">2m</span> (m)
Total Deck Area	<span style="border: 1px solid black; padding: 2px;">75</span> (sq.m) Special Routes <input type="checkbox"/> Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	<span style="border: 1px solid black; padding: 2px;">4.9</span> (m) Detour Length Around Bridge <span style="border: 1px solid black; padding: 2px;">8.4</span> (km)
Skew Angle	<span style="border: 1px solid black; padding: 2px;">0</span> (Deg.) Direction of Structure <span style="border: 1px solid black; padding: 2px;">East-West</span>
No. of Spans	<span style="border: 1px solid black; padding: 2px;">1</span> Fill on Structure <span style="border: 1px solid black; padding: 2px;">0</span> (m)
Span Lengths	<span style="border: 1px solid black; padding: 2px;">11.1</span> (m)

Historical Data:	
Year Built	<span style="border: 1px solid black; padding: 2px;">1923</span> Last Evaluation <span style="border: 1px solid black; padding: 2px;"></span>
Last Biennial Inspection	<span style="border: 1px solid black; padding: 2px;">2020-09-10</span> Current Load Limit <span style="border: 1px solid black; padding: 2px;">19-28-39</span> (tonnes)
Last BridgeMaster Inspection	<span style="border: 1px solid black; padding: 2px;"></span> Load Limit By-Law# <span style="border: 1px solid black; padding: 2px;">2020-57</span>
Last Condition Survey	<span style="border: 1px solid black; padding: 2px;"></span> By-Law Expiry Date <span style="border: 1px solid black; padding: 2px;"></span>
Last Underwater Inspection	<span style="border: 1px solid black; padding: 2px;"></span>

Rehab History: (Date/description)

**Scheduled Improvements:**

Regional Priority Number  Programmed Work Year

Nature of Program Work:

Appraisal Indices:		Comments
Fatigue		
Seismic		
Scour		
Flood		
Geometrics		
Barrier		
Curb		
Load Capacity		

Field Inspection Information:	
Date of Inspection:	June 2, 2022
Inspector:	Abdul Rahman Stott
Others in Party:	Cody Chambers
Equipment Used:	Camera and Hand Tools
Weather:	Partly Cloudy
Temperature:	19°C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Detailed Deck Condition Survey:	X		
Non-destructive Delamination Survey of Asphalt-Covered Deck:	X		
Substructure Condition Survey:	X		
Detailed Coating Condition Survey:	X		
Underwater Investigation:	X		
Fatigue Investigation:	X		
Seismic Investigation:	X		
Structure Evaluation:		X	
Monitoring of Deformations, Settlements and Movements:		X	

The structure is generally in poor condition and shows signs of structural distress.

Recommended actions:

- Replace structure (1-5 yrs.)
- Provide continuous monitoring until structure is replaced as part of structure maintenance
- Install missing maximum tonnes sign and hazard sign as part of structure maintenance

BCI (2020): 27.03

BCI (2022): 25.64

Next Detailed Visual Inspection:	2024
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Suspected Performance Deficiencies

00 None	06 Bearing not uniformly loaded/unstable	12 Slippery surfaces
01 Load carrying capacity	07 Jammed expansion joint	13 Flooding/channel blockage
02 Excessive deformations (deflections & rotations)	08 Pedestrian/vehicular hazard	14 Undermining of foundation
03 Continuing settlement	09 Rough riding surface	15 Unstable embankments
04 Continuing movements	10 Surface ponding	16 Other
05 Seized bearings	11 Deck drainage	

Maintenance Needs

01 Lift and Swing Bridge Maintenance	07 Repair of Structural Steel	13 Erosion Control at Bridges
02 Bridge Cleaning	08 Repair of Bridge Concrete	14 Concrete Sealing
03 Bridge Handrail Maintenance	09 Repair of Bridge Timber	15 Rout and Seal
04 Painting Steel Bridge Structures	10 Bailey bridges – Maintenance	16 Bridge Deck Drainage
05 Bridge Deck Joint Repair	11 Animal/Pest Control	17 Other
06 Bridge Bearing Maintenance	12 Bridge Surface Repair	

Element Data

Element Group:	Abutments	Length	N/A				
Element Name:	Abutment Walls	Width	6m				
Location:	Either end of structure	Height	3m				
Material:	Cast-in-place Concrete	Count	2				
Element Type:	Conventional Closed	Total Quantity:	48m <sup>2</sup>				
Environment:	Benign	Limited Inspection	<input type="checkbox"/>				
Protection System:	None					Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc.	Good	Fair	Poor*		
		0	0	5	25	01	
Comments: Typical severe scaling, spalling, and separation at construction joints. Spall under north girder at east end							
Recommended Work: Provide continuous monitoring and replace structure							
		None	<input type="checkbox"/>	6-10 years	<input type="checkbox"/>	1-5 years	<input checked="" type="checkbox"/>
						<1 year	<input type="checkbox"/>
						Urgent	<input type="checkbox"/>

Element Group:	Abutments	Length	4m				
Element Name:	Wingwalls	Width	N/A				
Location:	All four quadrants	Height	3m				
Material:	Cast-in-place Concrete	Count	4				
Element Type:		Total Quantity:	48m <sup>2</sup>				
Environment:	Moderate	Limited Inspection	<input type="checkbox"/>				
Protection System:						Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc.	Good	Fair	Poor*		
		0	0	28	20	00	
Comments: Typical wide cracking at construction joints and severe scaling. Southeast wingwalls has separated from the rest of the abutment							
Recommended Work: Provide continuous monitoring and replace structure							
		None	<input type="checkbox"/>	6-10 years	<input type="checkbox"/>	1-5 years	<input checked="" type="checkbox"/>
						<1 year	<input type="checkbox"/>
						Urgent	<input type="checkbox"/>

Element Group:	Approaches	Length	5m				
Element Name:	Wearing Surface	Width	4.9m				
Location:	Either end of deck	Height					
Material:	Asphalt	Count	2				
Element Type:		Total Quantity:	49m <sup>2</sup>				
Environment:	Severe	Limited Inspection	<input type="checkbox"/>				
Protection System:	None					Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc.	Good	Fair	Poor*		
		0	25	10	19	00	02
Comments: Localized patched/unpatched potholes and settlement. Wide alligator cracks and uneven riding surface. Debris accumulation							
Recommended Work:							
		None	<input checked="" type="checkbox"/>	6-10 years	<input type="checkbox"/>	1-5 years	<input type="checkbox"/>
						<1 year	<input type="checkbox"/>
						Urgent	<input type="checkbox"/>

Element Group:	Approaches	Length	20					
Element Name:	Barriers	Width						
Location:	West approach, south edge	Height						
Material:	Steel	Count	1					
Element Type:	Steel flex beam on steel posts	Total Quantity:	20m					
Environment:	Severe	Limited Inspection	<input type="checkbox"/>					
Protection System:	None					Perform. Deficiencies	Maint. Needs	
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	m	0	0	0	20	00		
Comments: All steel posts exhibit extensive coating loss, rust jacking, and light to severe corrosion. Typical deformation of railing and improper connections at posts.								
Recommended Work: Install code-compliant roadside protection as part of structure replacement.                 None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>								

Element Group:	Barriers	Length	13m					
Element Name:	Railing Systems	Width						
Location:	Either edge of deck	Height	1.2m					
Material:	Steel	Count	2					
Element Type:	Steel Post and Lattice	Total Quantity:	26m					
Environment:	Severe	Limited Inspection	<input type="checkbox"/>					
Protection System:	None					Perform. Deficiencies	Maint. Needs	
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	m	0	0	20	6	08		
Comments: Not code compliant. Light to moderate corrosion in steel. Collision damage with broken segments and deformation. Railing is tilting outwards. Concrete end walls are in poor condition with scaling, disintegration, wide cracking, and are discontinuous with barrier. A double C-channel barrier has been bolted to the original barrier and end wall at northwest quadrant to provide additional roadside protection.								
Recommended Work: Provide continuous monitoring and replace structure                 None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>								

Element Group:	Beams/MLEs	Length	12.5m					
Element Name:	Girders	Width	0.4m					
Location:	Underside of deck	Height	0.7m					
Material:	Cast-in-place Concrete	Count	4					
Element Type:	T-Type	Total Quantity:	90m <sup>2</sup>					
Environment:	Benign	Limited Inspection	<input type="checkbox"/>					
Protection System:	None					Perform. Deficiencies	Maint. Needs	
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	m <sup>2</sup>	0	20	35	35	01		
Comments: Severe scaling in webs. Shear cracks at end of south beam. Typical delamination and spalling with exposed and corroded rebar in interior beams. Localized narrow longitudinal cracking on interior beams at west end.								
Recommended Work: Provide continuous monitoring and replace structure                 None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>								

Element Group:	Decks	Length	13m				
Element Name:	Deck Top – Thin Slab	Width	5.8m				
Location:	Spanning between abutments	Height					
Material:	Cast-in-place Concrete	Count	1				
Element Type:		Total Quantity:	75.4m <sup>2</sup>				
Environment:	Severe	Limited Inspection	<input checked="" type="checkbox"/>				
Protection System:	None					Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc. 0	Good 45.4	Fair 30	Poor* 0		
Comments:							
Recommended Work: Provide continuous monitoring and replace structure							
None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

Element Group:	Decks	Length	13m				
Element Name:	Soffit – Thin Slab	Width	5.8m				
Location:	Underside of deck	Height					
Material:	Cast-in-place Concrete	Count	1				
Element Type:		Total Quantity:	75.4m <sup>2</sup>				
Environment:	Benign	Limited Inspection	<input type="checkbox"/>				
Protection System:	None					Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc. 0	Good 0	Fair 71.4	Poor* 4		
Comments: Localized spalling with exposed and corroded rebar at west end. Typical delamination and localized cracking with corrosion staining							
Recommended Work: Provide continuous monitoring and replace structure							
None <input type="checkbox"/> 6-10 years <input checked="" type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

Element Group:	Decks	Length	13m				
Element Name:	Wearing Surface	Width	4.9m				
Location:	Covering deck	Height					
Material:	Asphalt	Count	1				
Element Type:		Total Quantity:	63.7m <sup>2</sup>				
Environment:	Severe	Limited Inspection	<input type="checkbox"/>				
Protection System:						Perform. Deficiencies	Maint. Needs
Condition Data:	Units m <sup>2</sup>	Exc. 0	Good 53.7	Fair 10	Poor* 0		
Comments: Extensive debris accumulation near deck edges and light to medium ravelling. Wide transverse cracking, patches, and abrasions near the centreline.							
Recommended Work: Clean deck as a part of regular maintenance							
None <input checked="" type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

Element Group:	Embankments & Streams		Length	N/A				
Element Name:	Embankments		Width	N/A				
Location:	Side slopes of abutments		Height	N/A				
Material:			Count	4				
Element Type:			Total Quantity:	4				
Environment:			Limited Inspection	<input type="checkbox"/>				
Protection System:							Perform. Deficiencies	Maint. Needs
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	Each	0	2	0	2	00		
Comments: Severe erosion on west embankments.								
Recommended Work:    None <input checked="" type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>								

Element Group:	Embankments & Streams		Length	N/A				
Element Name:	Streams and Waterways		Width	N/A				
Location:	Between abutments		Height	N/A				
Material:			Count	N/A				
Element Type:			Total Quantity:	All				
Environment:			Limited Inspection	<input type="checkbox"/>				
Protection System:							Perform. Deficiencies	Maint. Needs
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	All			All		00		
Comments: Stream flows north to south								
Recommended Work:    None <input checked="" type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>								

Element Group:	Foundations		Length	N/A				
Element Name:	Foundation (below grnd lvl)		Width	N/A				
Location:	Buried substructure		Height	N/A				
Material:	Cast-in-place Concrete		Count	N/A				
Element Type:			Total Quantity:	N/A				
Environment:			Limited Inspection	<input type="checkbox"/>				
Protection System:	None						Perform. Deficiencies	Maint. Needs
Condition Data:	Units	Exc.	Good	Fair	Poor*			
	All	0	0	0	0	00		
Comments:								
Recommended Work:    None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/> Provide continuous monitoring and replace structure								

Element Group:	Sidewalks/Curbs	Length	13m				
Element Name:	Curbs	Width	0.2m				
Location:	Either edge of deck	Height	0.1m				
Material:	Cast-in-place Concrete	Count	2				
Element Type:		Total Quantity:	5.4m <sup>2</sup>				
Environment:	Severe	Limited Inspection	<input type="checkbox"/>				
Protection System:	None					Perform. Deficiencies	Maint. Needs
Condition	Units	Exc.	Good	Fair	Poor*		
Data:	m <sup>2</sup>	0	0	4.9	0.5	00	
Comments: Light to severe scaling. Severe accumulation of gravel debris.							
Recommended Work: None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input checked="" type="checkbox"/> <1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							
Provide continuous monitoring and replace structure							

Element Group:	Accessories	Length	N/A				
Element Name:	Signs	Width	N/A				
Location:	All four quadrants	Height	N/A				
Material:	Steel	Count	6				
Element Type:	Hazard Marker signs and Maximum Tonnes signs	Total Quantity:	6				
Environment:	Severe	Limited Inspection	<input type="checkbox"/>				
Protection System:						Perform. Deficiencies	Maint. Needs
Condition	Units	Exc.	Good	Fair	Poor*		
Data:	All	0	3	1	2	00	
Comments: Southwest sign is misaligned. East max. tonnes sign is missing and northeast hazard sign is missing. West max. tonnes and south hazard signs are deformed.							
Recommended Work: None <input type="checkbox"/> 6-10 years <input type="checkbox"/> 1-5 years <input type="checkbox"/> <1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>							
Install missing hazard and max. tonnes signs.							



**BRIDGE PHOTOGRAPHS**

Owner: Municipality Of Tweed  
Hwy/Road Name: Bosley Road

Structure Name: Ross Bridge  
Location: 1.00 km west of Queensborough Road



*Photo 1: East Approach and Deck Top Looking West*

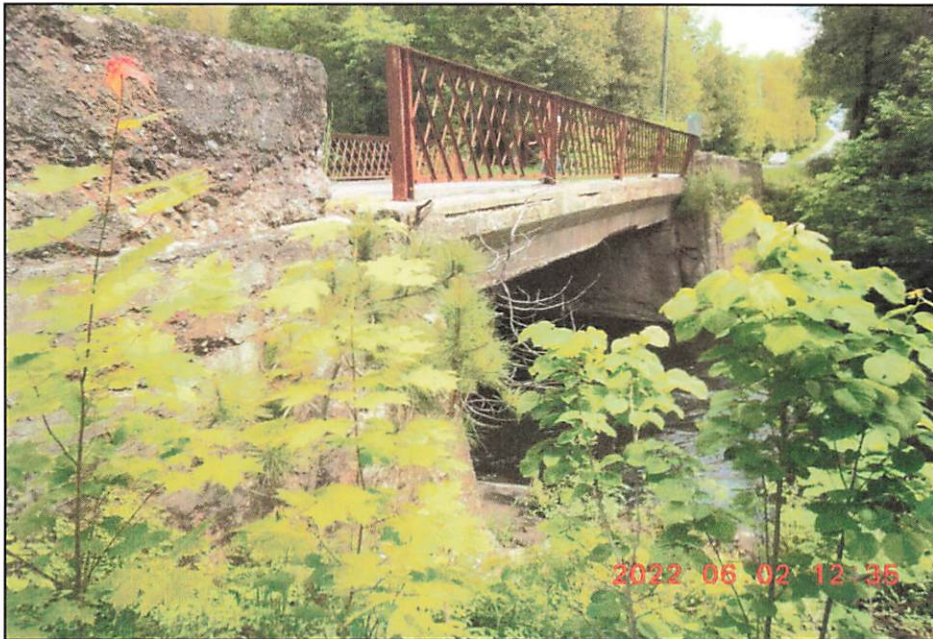


*Photo 2: North Barrier*

**BRIDGE PHOTOGRAPHS**

Owner: Municipality Of Tweed  
Hwy/Road Name: Bosley Road

Structure Name: Ross Bridge  
Location: 1.00 km west of Queensborough Road



*Photo 3: South Barrier, Fascia, and T-Beam*



*Photo 4: Cracking and Spalling on East Abutment Wall*

**BRIDGE PHOTOGRAPHS**

Owner: Municipality Of Tweed  
Hwy/Road Name: Bosley Road

Structure Name: Ross Bridge  
Location: 1.00 km west of Queensborough Road



*Photo 5: Interior Soffit and T-Beams Looking East*



*Photo 6: West Abutment Wall*

**BRIDGE PHOTOGRAPHS**

Owner: Municipality Of Tweed  
Hwy/Road Name: Bosley Road

Structure Name: Ross Bridge  
Location: 1.00 km west of Queensborough Road



*Photo 7: Spalling on South Exterior T-Beam*



*Photo 8: Spalling on North Exterior T-Beam*

**BRIDGE PHOTOGRAPHS**

Owner: Municipality Of Tweed  
Hwy/Road Name: Bosley Road

Structure Name: Ross Bridge  
Location: 1.00 km west of Queensborough Road



*Photo 9: Deformation on South Barrier*



*Photo 10: Outward Rotation of Southeast Barrier*

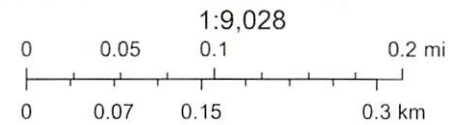
# Ross Bridge Location



2/8/2023, 4:13:28 PM

Civic Addresses

 Property Information

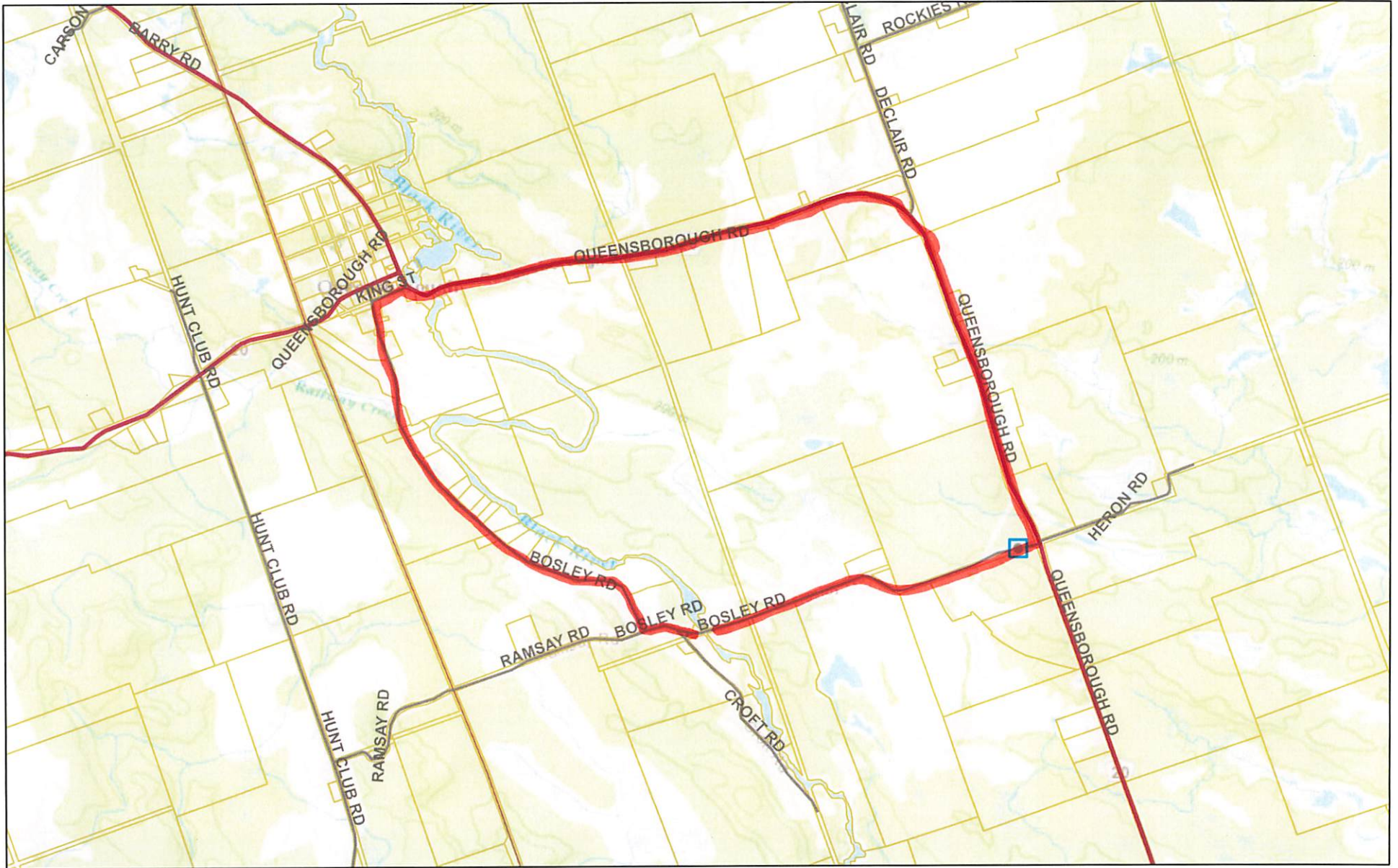


Hastings County, Province of Ontario, Ontario MNR, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA,

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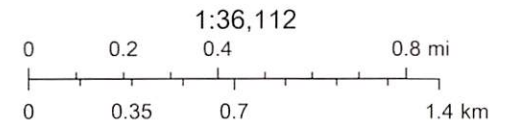
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# Ross Bridge Detour



8/29/2023, 2:38:41 PM

 Property Information

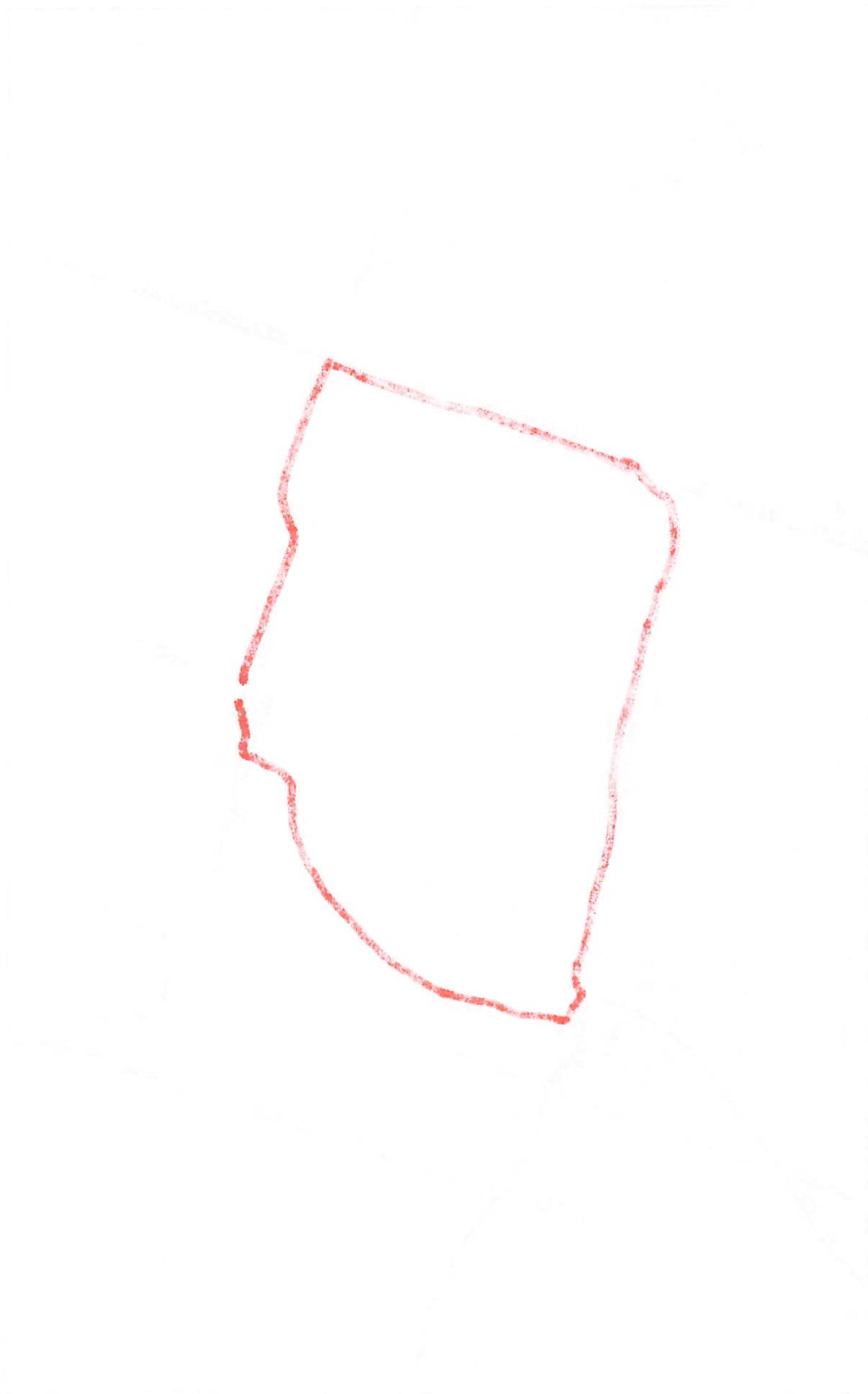


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