Tay Valley Township

THE CORPORATION OF TAY VALLEY TOWNSHIP
REQUEST FOR PROPOSAL

ENGINEERING SERVICES FOR THE REPLACEMENT OF BOLINGBROKE BRIDGE

CONTRACT #2019-PW-006

ADDENDUM NO. 1

THIS ADDENDUM SHALL BE INCORPORATED INTO THE RFP PACKAGE AND SHALL FORM A PART OF THE CONTRACT DOCUMENTS

Date Issued: April 9, 2019
Issued By: Amanda Mabo, Clerk

Please note the following changes, corrections, additions, deletions, information and/or instructions in connection with the RFP Package. Failure to acknowledge receipt of this Addendum as per Part "A" – Information to Bidders may render your submission non-responsive.

This addendum is to address the following question(s) and clarification(s):

Clarification 1:

Please see attached Addendum "D" 2019 OSIM Inspection, by Ainley Graham and Associates Ltd. dated August 29, 2018

End of Addendum 1

Amanda Mabo, Clerk
clerk@tayvalleytwp.ca

(ID 15-072) - Bolingbroke Bridge

Description

This structure is a Slab on Steel Girder Bridge located on Crow Lake Road, 0.1 km west of Bolingbroke Road. Deck length is 37.0 metres, width of 5.7 metres. The structure accommodates a 5.0 metre wide wearing surface.

Additional Investigations Required

- None.

Maintenance Needs (1-2 years)

- None.

Recommended Work

The structure is generally in fair to poor condition. The deck top, girder ends, pier column connections, structural steel coating, abutment bearings, abutment walls and wingwalls all evidenced severe deterioration. Due to the amount of deterioration throughout the listed elements replacement of structure is recommended in 1 to 5 years. The full extent of the rehabilitation required to address some of the elements, in particular the deck, will likely be more costly than replacing the bridge in it's entirety. An enhanced OSIM should be carried out in 2020 to determine the extent of deterioration of the girders, piers and soffit.

Summary Action Report
Bolingbroke Bridge
Site No.: 15-072

Inspection Date	29-Aug-18	**Condition Index Value (BCI)**	**53.0**
Next Biennial Inspection	2020	**Current Replacement Value**	**$2,337,693**

Additional Investigations

Investigation	Priority	Cost	Investigation	Priority	Cost

Performance Deficiencies

Element Group	Element	Performance Deficiency

Maintenance Needs

Element Group	Element	Maintenance Required	Priority	Comment

Repair/ Rehabilitation

Element Group	Element	Repair/Rehabilitation	Priority	Cost
Deck	Deck Top	Replace	1 - 5 years	$225,000
Barriers	Railing System	Replace	6 - 10 years	$70,000
Barriers	Parapet Walls	Replace	6 - 10 years	$10,000
Deck	Soffit (Interior and Exterior)	Repair	6 - 10 years	$30,000
Beams/MLE's	Girders	Replace	1 - 5 years	$60,000
Pier	Shafts/Columns/Pile Bents	Repair	1 - 5 years	$12,000
Coatings	Structural Steel	Repair	1 - 5 years	$10,000
Abutments	Bearings	Replace	1 - 5 years	$100,000
Abutments	Abutment Walls	Repair	1 - 5 years	$19,000
Abutments	Wingwalls	Repair	1 - 5 years	$12,000

Total Repair/Rehabilitation Cost	$548,000
Total Associated Work Cost	$327,000
Total Cost	$875,000

Overall Comments

The structure is generally in fair to poor condition. The deck top, girder ends, pier column connections, structural steel coating, abutment bearings, abutment walls and wingwalls all evidenced severe deterioration. Due to the amount of deterioration throughout the listed elements replacement of structure is recommended in 1 to 5 years. The full extent of the rehabilitation required to address some of the elements, in particular the deck, will likely be more costly than replacing the bridge in it's entirety. An enhanced OSIM should be carrier out in 2020 to determine the extent of deterioration of the girders, piers and soffit.

Inventory Data:

Structure Name	Bolingbroke Bridge	**Hwy No.**	N/A
Cross. Type Over:	X Road; Rail; Ped.; Navig. Water; Non-Navig.; Other		
Cross.Type Under:	Road; Rail; Ped.; X Navig. Water; Non-Navig.; Other		
Hwy/Road Name	Crow Lake Road		
Structure Location	0.1 West of Bolingbroke Road		
Latitude	44.759813°	**Longitude**	-76.519657°
Cur. Rep. Value**	$2,337,693		
Owners	Tay Valley Township	**Heritage Status**	No Considered
MTO Region	Eastern	**Road Class**	Local
MTO District		**Lane Type**	
Old County	Lanark	**Posted Speed**	40
No. Lanes	1		
Ward	Sherbrooke	**AADT**	200
Truck %	25		
Structure Type	Slab on Steel Girders	**Inspection Route Sequence**	
Total Deck Length	37.0 m	**Interchange Number**	
Overall Str. Width	5.7 m	**Interchange Structure Number**	
Total Deck Area	210.9 m²	**Detour Length Around Bridge**	28 km
		Fill on Structure	0 m
Roadway Width	5.0 m	**Direction of Structure**	North to South
Skew Angle	0 Degrees		
No. of Spans	3	**Special Routes:**	**School** X **Bicycle**; **Transit** **Truck**
Span Lengths	12.3, 12.3, 12.3 m		

**Current Replacement Value is based on in kind replacement of the existing structure and calculated using benchmark costs. Capital planning should be consider site specific cost factors and requirements for widening or lengthing of the structure.

Historical Data:

Year Built	1930	**Year of Last Major Rehab.**	2012
Last OSIM Inspection	2016	**Last Evaluation**	2008
Last Enhanced OSIM	N/A	**Current Load Limit**	14 tonnes
Last Underwater Inspec.	N/A	**Load Limit By-Law #**	N/A
Last Condition Survey	N/A	**By-Law Expiry Date**	N/A

Rehab History: (Date / Description)

1974 - Deck Replaced

2003 - Approaches resurfaced, hot rubberized sealant placed in expansion joints, beams & girders 4 m at E. Abutment and 1m at W. Abutment were hand cleaned & painted.

2009 - Repairs to girder flanges, reinforcement of webs and hand cleaned and painted 1.5 m of girder ends.

2010 - Rehabilitation of concrete pier pedestals

2012 - Full depth deck repairs and stringer replacement at the south end

Field Inspection Information:						
Date of Inspection:	August 29, 2018	Type of Inspection:	X	OSIM		Enhanced OSIM
Inspector:	Bill Harvey					
Others in Party:	Steve Oliver					
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.					
Weather:	Sunny					
Temperature:	30 C˚					

Additional Investigations Required:		Priority		
		None	Normal	Urgent
Material Condition Survey				
	Detailed Deck Condition Survey:	X		
	Non-Destructive Delamination Survey of Asphalt-Covered Deck:	X		
	Concrete Substructure Condition Survey:	X		
	Detailed Coating Condition Survey:	X		
	Detailed Timber Investigation:	X		
	Post-Tensioned Strand Investigation:	X		
Underwater Investigation:		X		
Fatigue Investigation:		X		
Seismic Investigation:		X		
Structure Evaluation:		X		
Monitoring				
	Monitoring of Deformations, Settlements and Movements:	X		
	Monitoring Crack Widths:	X		

Investigation Notes:

Overall Structure Notes:								
Recommended Work on Structure:		None		Minor Rehab.		Major Rehab.	X	Replace
Timing of Recommended Work:		X	1 to 5 years		6 to 10 years			
Overall Comments:	The structure is generally in fair to poor condition. The deck top, girder ends, pier column connections, structural steel coating, abutment bearings, abutment walls and wingwalls all evidenced severe deterioration. Due to the amount of deterioration throughout the listed elements replacement of structure is recommended in 1 to 5 years. The full extent of the rehabilitation required to address some of the elements, in particular the deck, will likely be more costly than replacing the bridge in it's entirety. An enhanced OSIM should be carrier out in 2020 to determine the extent of deterioration of the girders, piers and soffit.							
Date of Next Inspection:	2020							

Suspected Performance Deficiencies

01 Load carrying capacity
02 Excessive deformations (deflections & rotations)
03 Continuing settlement
04 Continuing movements
05 Seized bearings
06 Bearing not uniformly loaded/unstable
07 Jammed expansion joint
08 Pedestrian/vehicular hazard
09 Rough riding surface
10 Surface ponding
11 Deck drainage
12 Slippery surfaces
13 Flooding/channel blockage
14 Undermining of foundation
15 Unstable embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Rehab History: (Date / Description)
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair of Bridge Concrete
09 Repair of Bridge Timber
10 Bailey bridges - Maintenance
11 Animal/Pest Control
12 Bridge Surface Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Scaling (Loose Concrete or ACR Steel)
18 Other

Element Data	**Bridge Name**	Bolingbroke Bridge

Element Group:	Deck					Length:	37.0				
Element Name:	Deck Top (Exposed Wearing Surface)					Width:	5.7				
Location:	North to South					Height:	N/A				
Material:	Cast-in-Place Concrete					Count (items):	1				
Element Type:	Thin-Slab					Total Quantity:	210.9	m²			
Environment:	Severe					Limited Inspection					
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*		Deficiencies
	m²				64.7		110.0		36.2		
Comments:	The deck was difficult to inspect due to the amount of debris. Severe delaminations (30.0 m²) and wide transverse cracking (5.7 m²) , light spalling (0.3 m²), narrow to medium cracking, light scaling and light abrasions (0.2 m²). A detailed deck condition survey is recommended to determine the full extent of deterioration.										
Recommended Work:		Rehab	X	Replace		**Maintenance Needs:**					
	X	1-5 years		6-10 years			Urgent	X	1 year		2 years
- Replace						02 - Bridge Cleaning - Remove debris from the deck.					

Element Group:	Approaches					Length:	6.0				
Element Name:	Wearing Surface					Width:	5.0				
Location:	North and South					Height:	N/A				
Material:	Asphalt					Count (items):	2				
Element Type:						Total Quantity:	60.0	m²			
Environment:	Severe					Limited Inspection					
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*		Deficiencies
	m²				36.2		20.0		3.8		
Comments:	Medium to severe transverse cracking (3.7 m²), light potholes (0.1 m²), light to medium ravelling and asphalt patch localized at the deck joint. The majority of deterioration was observed on the south approach.										
Recommended Work:		Rehab		Replace		**Maintenance Needs:**					
		1-5 years		6-10 years			Urgent		1 year		2 years

Element Group:	Barriers					Length:	35.2				
Element Name:	Railing System					Width:	N/A				
Location:	East and West					Height:	N/A				
Material:	Aluminum					Count (items):	2				
Element Type:	3-Rail Aluminum Stanchion					Total Quantity:	70.4	m			
Environment:	Severe					Limited Inspection					
Protection System:											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*		Deficiencies
	m				58.4		8.0		4.0		
Comments:	Several areas of collision damage and light to medium abrasion were noted in both railing systems. Collision damage with a light perforation was observed on the west railing system										
Recommended Work:		Rehab	X	Replace		**Maintenance Needs:**					
		1-5 years	X	6-10 years			Urgent		1 year		2 years
- Replace											

Element Group:	Barriers					Length:	0.9						
Element Name:	Parapet Walls					Width:	0.30						
Location:	NE, NW, SE and SW					Height:	1.00						
Material:	Cast-in-Place Concrete					Count (items):	4						
Element Type:	Concrete End-Post (Interior and Exterior)					Total Quantity:	8.3	m²					
Environment:	Severe					Limited Inspection							
Protection System:	None												Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*				Deficiencies
	m²				1.1		3.6		3.6				
Comments:	Medium spalling (0.5 m²), light delamination (0.2 m²), medium to wide cracking (0.2 m²), medium to severe scaling (2.2), light disintegration(0.3 m²), light abrasions (0.2 m²) and hairline to narrow cracking. A benchmark was noted on the southeast end post and a plaque on the northeast												
Recommended Work:		Rehab	X	Replace		**Maintenance Needs:**							
		1-5 years	X	6-10 years			Urgent		1 year		2 years		
- Replace													

Element Group:	Decks					Length:	37.0						
Element Name:	Soffit - Thin Slab					Width:	0.4						
Location:	East and West					Height:	0.2 (Fascia)						
Material:	Cast-in-Place Concrete					Count (items):	2						
Element Type:	Thin Slab - Exterior					Total Quantity:	44.4	m²					
Environment:	Moderate					Limited Inspection							
Protection System:	None												Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*				Deficiencies
	m²				22.6		20.0		1.8				
Comments:	Light to medium delaminations (0.5 m²), light to medium spalling (0.5 m²), medium to wide cracking (0.8 m²), light to medium scaling, light scaling and rust staining. It's recommended that a enhanced OSIM be conducted in 2020 in order to properly examine the interior and exterior soffits.												
Recommended Work:	X	Rehab		Replace		**Maintenance Needs:**							
		1-5 years	X	6-10 years			Urgent		1 year		2 years		
- Concrete repair and crack injection													

Element Group:	Decks					Length:	37.0						
Element Name:	Soffit - Thin Slab					Width:	4.9						
Location:	Interior					Height:	N/A						
Material:	Cast-in-Place Concrete					Count (items):	1						
Element Type:	Thin Slab - Interior					Total Quantity:	181.3	m²					
Environment:	Benign					Limited Inspection							
Protection System:	None												Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*				Deficiencies
	m²				140.8		40.0		0.5				
Comments:	Light to medium spalling (0.5 m²), localized medium honeycombing, rust staining and hairline to narrow cracking with moisture staining. It's recommended that a enhanced OSIM be conducted in 2020 in order to properly examine the interior and exterior soffits.												
Recommended Work:		Rehab		Replace		**Maintenance Needs:**							
		1-5 years		6-10 years			Urgent		1 year		2 years		

Element Group:	Beams/MLE's				Length:	37.00					
Element Name:	Girders				Width:	0.24					
Location:	East and West				Height:	0.66					
Material:	Steel				Count (items):	2					
Element Type:	I - Type				Total Quantity:	151.0	m²				
Environment:	Moderate				Limited Inspection						
Protection System:	Paint									Perform.	
Condition Data:	Units		Exc.		Good	Fair		Poor*		Deficiencies	
	m²				76.0	60.0		15.0			
Comments:	The coating on the north end of the girders have failed and medium to severe corrosion is evident. The girder ends on the south exhibited light to medium corrosion. Light to medium corrosion was evident throughout the entire lengths of both the east and west girders. Misalignment was noted between east and west girders over the south pier. It's recommended that a enhanced OSIM be conducted in 2020 in order to properly examine the girders.										
Recommended Work:		Rehab	X	Replace	**Maintenance Needs:**						
	X	1-5 years		6-10 years		Urgent		1 year		2 years	
- Replace											

Element Group:	Beams/MLE's				Length:	4.70					
Element Name:	Floor Beams				Width:	0.17					
Location:					Height:	0.38					
Material:	Steel				Count (items):	8					
Element Type:	I - Type				Total Quantity:	47.8	m²				
Environment:	Benign				Limited Inspection						
Protection System:	Paint									Perform.	
Condition Data:	Units		Exc.		Good	Fair		Poor*		Deficiencies	
	m²				47.8	0.0		0.0			
Comments:	Localized light corrosion beginning to form										
Recommended Work:		Rehab		Replace	**Maintenance Needs:**						
		1-5 years		6-10 years		Urgent		1 year		2 years	

Element Group:	Beams/MLE's				Length:	4.10					
Element Name:	Stringers				Width:	0.11					
Location:	Underside of Deck				Height:	0.23					
Material:	Steel				Count (items):	36					
Element Type:	I - Type				Total Quantity:	36	each				
Environment:	Benign				Limited Inspection						
Protection System:	Paint									Perform.	
Condition Data:	Units		Exc.		Good	Fair		Poor*		Deficiencies	
	each				36	0		0			
Comments:	The stringers were in generally good condition exhibiting light corrosion and localized medium corrosion along the top flange.										
Recommended Work:		Rehab		Replace	**Maintenance Needs:**						
		1-5 years		6-10 years		Urgent		1 year		2 years	

Element Group:	Pier					Length:	N/A					
Element Name:	Bearings					Width:	N/A					
Location:	North and South Pier					Height:	N/A					
Material:	Steel					Count (items):	4					
Element Type:	Steel Shoe Plates					Total Quantity:	4	each				
Environment:	Benign					Limited Inspection	X					
Protection System:	None											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
	m²						4		0			
Comments:	Limited inspection due to access. The area observed evidenced light to medium corrosion. It's recommended that an enhanced OSIM be conducted in 2020.											
Recommended Work:			Rehab		Replace		**Maintenance Needs:**					
			1-5 years		6-10 years			Urgent		1 year		2 years

Element Group:	Piers					Length:	1.0					
Element Name:	Shafts/Columns/Pile Bents					Width:	1.0					
Location:	NE, NW, SE and SW					Height:	1.3					
Material:	Cast-in-Place Concrete					Count (items):	4					
Element Type:	Pier Footing and Pedestal					Total Quantity:	20.8	m²				
Environment:	Benign					Limited Inspection						
Protection System:	None											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
	m²				11.4		6.0		3.4			
Comments:	Light to medium delamination (0.8 m²) localized in the footings, medium to wide cracking (0.5 m²), medium to severe scaling (2.1 m²), light scour and erosion.											
Recommended Work:	X		Rehab		Replace		**Maintenance Needs:**					
	X		1-5 years		6-10 years			Urgent		1 year		2 years
- Repair												

Element Group:	Piers					Length:	0.2					
Element Name:	Shafts/Columns/Pile Bents					Width:	0.2					
Location:	NE, NW, SE and SW					Height:	6.0					
Material:	Steel					Count (items):	4					
Element Type:	Pier Column					Total Quantity:	28.8	m²				
Environment:	Benign					Limited Inspection						
Protection System:	Paint											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
	m²				16.8		10.0		2.0			
Comments:	Medium to severe corrosion (2.0 m²) localized at the connections to the pedestals, light corrosion observed throughout. Section loss and perforations were evident throughout the connections.											
Recommended Work:	X		Rehab		Replace		**Maintenance Needs:**					
	X		1-5 years		6-10 years			Urgent		1 year		2 years
- Repair												

Element Group:	Piers					Length:	0.18						
Element Name:	Shafts/Columns/Pile Bents					Width:	4.30						
Location:	Underside of Deck					Height:	0.07						
Material:	Steel					Count (items):	4						
Element Type:	Horizontal Bracing					Total Quantity:	4	each					
Environment:	Benign					Limited Inspection							
Protection System:	Paint											Perform.	
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies	
	each				4		0		0				
Comments:	Evidence of light corrosion forming												
Recommended Work:		Rehab		Replace		**Maintenance Needs:**							
		1-5 years		6-10 years			Urgent		1 year		2 years		

Element Group:	Piers					Length:	N/A						
Element Name:	Shafts/Columns/Pile Bents					Width:	N/A						
Location:	East and West					Height:	N/A						
Material:	Steel					Count (items):	2						
Element Type:	Cross Bracing					Total Quantity:	2	each					
Environment:	Moderate					Limited Inspection							
Protection System:	Paint											Perform.	
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies	
	each				2		0		0				
Comments:	Evidence of light corrosion forming												
Recommended Work:		Rehab		Replace		**Maintenance Needs:**							
		1-5 years		6-10 years			Urgent		1 year		2 years		

Element Group:	Coatings					Length:	N/A						
Element Name:	Structural Steel					Width:	N/A						
Location:	Structural Steel Members					Height:	N/A						
Material:	Paint					Count (items):	1						
Element Type:						Total Quantity:	329.2	m^2					
Environment:	Benign					Limited Inspection							
Protection System:	Paint											Perform.	
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies	
	m^2				50.0		234.2		45.0				
Comments:	Undercutting, blisters and medium to severe corrosion throughout the girder exteriors and ends. Light to medium corrosion throughout remaining steel members.												
Recommended Work:		Rehab	X	Replace		**Maintenance Needs:**							
	X	1-5 years		6-10 years			Urgent		1 year		2 years		
- Replace													

Element Group:	Abutments				Length:	N/A					
Element Name:	Bearings				Width:	N/A					
Location:	North and South Abutment Walls				Height:	N/A					
Material:	Steel Plate				Count (items):	4					
Element Type:	Abutment Bearings				Total Quantity:	4	each				
Environment:	Benign				Limited Inspection	X					
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	m²					4		0			
Comments:	Limited inspection due to line of sight. The areas of the bearings that were observed evidenced medium to severe corrosion and medium deformations. An enhanced OSIM is recommended in 2020 to properly inspect the bearings.										
Recommended Work:		Rehab		Replace	**Maintenance Needs:**						
	X	1-5 years		6-10 years		Urgent		1 year		2 years	
- Replace											

Element Group:	Abutments				Length:	N/A					
Element Name:	Abutment Walls				Width:	5.7					
Location:	North				Height:	3.0					
Material:	Cast-in-Place Concrete				Count (items):	1					
Element Type:					Total Quantity:	17.1	m²				
Environment:	Benign				Limited Inspection						
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	m²					5.8		11.3			
Comments:	The previous patchwork has debonded from the wall. Severe delaminations (4.9 m²), medium to severe spalling (3.5 m²) and light to medium cracking throughout. The northeast corner exhibited severe scaling (2.0 m²), severe disintegration (0.9 m²) and erosion.										
Recommended Work:	X	Rehab		Replace	**Maintenance Needs:**						
	X	1-5 years		6-10 years		Urgent		1 year		2 years	
- Concrete repair and crack injection											

Element Group:	Abutments				Length:	N/A					
Element Name:	Ballast Walls				Width:	N/A					
Location:	North and South				Height:	N/A					
Material:	Cast-In-Place Concrete				Count (items):	2					
Element Type:					Total Quantity:		m²				
Environment:	Benign				Limited Inspection	X					
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	m²										
Comments:	Limited access due to access.										
Recommended Work:		Rehab		Replace	**Maintenance Needs:**						
		1-5 years		6-10 years		Urgent		1 year		2 years	

Element Group:	Abutments					Length:	2.3					
Element Name:	Wingwalls					Width:	N/A					
Location:	NE, NW, SE and SW Quadrants					Height:	1.6					
Material:	Cast-In-Place Concrete					Count (items):	4					
Element Type:						Total Quantity:	14.7	m²				
Environment:	Moderate					Limited Inspection						
Protection System:	None											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
	m²				2.5		7.5		4.7			
Comments:	The length and height were taken as an average to determine the total quantity. Light to medium spalling (0.4 m²), localized severe scaling (3.8 m²), localized severe disintegration (0.5 m²), hairline to narrow cracking, light honey combing and light to medium scaling evidenced throughout all walls.											
Recommended Work:		X	Rehab		Replace	**Maintenance Needs:**						
		X	1-5 years		6-10 years		Urgent		1 year		2 years	

Element Group:	Foundations					Length:	N/A					
Element Name:	Foundations (below ground level)					Width:	N/A					
Location:	North and South					Height:	N/A					
Material:	Cast-In-Place Concrete					Count (items):	2					
Element Type:						Total Quantity:						
Environment:	Benign					Limited Inspection	X					
Protection System:	None											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
Comments:	Limited inspection. No evidence of instability or settlement at the time of inspection.											
Recommended Work:			Rehab		Replace	**Maintenance Needs:**						
			1-5 years		6-10 years		Urgent		1 year		2 years	

Element Group:	Embankments & Streams					Length:	N/A					
Element Name:	Embankments					Width:	N/A					
Location:	NE, NW, SE and SW of Structure					Height:	N/A					
Material:	Stone and Vegetation					Count (items):	4					
Element Type:						Total Quantity:	6	each				
Environment:	Benign					Limited Inspection						
Protection System:	Vegetation, Stone and Asphalt											Perform.
Condition Data:	Units		Exc.		Good		Fair		Poor*			Deficiencies
	each						4		2			
Comments:	The embankments were steep and sparsely vegetated. Severe erosion was observed on the northeast embankment and in front of the north abutment.											
Recommended Work:		X	Rehab		Replace	**Maintenance Needs:**						
		X	1-5 years		6-10 years		Urgent		1 year		2 years	
- Repair												

Element Group:	Embankments & Streams				Length:	NA					
Element Name:	Slope Protection				Width:	N/A					
Location:	NE, NW, SE and SW of Structure				Height:	N/A					
Material:	Vegetation, Stone and Asphalt				Count (items):	6					
Element Type:					Total Quantity:	6	each				
Environment:	Benign				Limited Inspection						
Protection System:	None										Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	each					4		2			
Comments:	The slope protection is not currently performing well. Asphalt was noted on the northeast embankment.										
Recommended Work:		Rehab		Replace		**Maintenance Needs:**					
	X	1-5 years		6-10 years			Urgent		1 year		2 years
- Replace											

Element Group:	Embankments & Streams				Length:	N/A					
Element Name:	Streams and Waterways				Width:	N/A					
Location:	West to East				Height:	N/A					
Material:					Count (items):	1					
Element Type:					Total Quantity:	1	each				
Environment:	Benign				Limited Inspection						
Protection System:											Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	each				1	0		0			
Comments:	The stream flows from west to east. No obstructions to flow was observed at the time of inspection.										
Recommended Work:		Rehab		Replace		**Maintenance Needs:**					
		1-5 years		6-10 years			Urgent		1 year		2 years

Element Group:	Accessories				Length:	N/A					
Element Name:	Signs				Width:	N/A					
Location:	Deck and Approaches				Height:	N/A					
Material:	Steel				Count (items):	4					
Element Type:					Total Quantity:	8	each				
Environment:	Benign				Limited Inspection						
Protection System:											Perform.
Condition Data:	Units		Exc.		Good	Fair		Poor*			Deficiencies
	each				7	1		0			
Comments:	The northeast hazard sign had significant collision damage. The signs consisted of 4 hazard signs, 2 load posting sings, 1 speed limit sign, narrow bridge sign and 2 Tay River signs.										
Recommended Work:		Rehab		Replace		**Maintenance Needs:**					
		1-5 years		6-10 years			Urgent		1 year		2 years

Repair/Rehabilitation Required

Element Group	Element	Repair/Rehabilitation	Priority	Cost
Deck	Deck Top	Replace	1 - 5 years	$225,000
Barriers	Railing System	Replace	6 - 10 years	$70,000
Barriers	Parapet Walls	Replace	6 - 10 years	$10,000
Deck	Soffit - Thin Slab (Interior and Exterior)	Repair	6 - 10 years	$30,000
Beams/MLE's	Girders	Replace	1 - 5 years	$60,000
Pier	Shafts/Columns/Pile Bents	Repair	1 - 5 years	$12,000
Coatings	Structural Steel	Repair	1 - 5 years	$10,000
Abutments	Bearings	Replace	1 - 5 years	$100,000
Abutments	Abutment Walls	Repair	1 - 5 years	19,000
Abutments	Wingwalls	Repair	1 - 5 years	$12,000

Total Repair/Rehabilitation Cost $548,000

Associated Work

	Comments		Estimated Cost
Approaches			
Detours			
Traffic Control			$70,000
Utilities			
Right-of-Way			
Environmental Study	Additional environmental protection		$20,000
Other	Dewatering		$50,000
Contingencies		10%	** $69,000
Engineering		20%	** $138,000

** If based on a percentage calculated values rounded-up to the nearest thousand dollars.

Total Associated Work Cost	$327,000
Total Repair/Rehabilitation Cost	$548,000
Total Cost	$875,000
Tay Valley Township Share @ 100%	$875,000

Justification

The structure is generally in fair to poor condition. The deck top, girder ends, pier column connections, structural steel coating, abutment bearings, abutment walls and wingwalls all evidenced severe deterioration. Due to the amount of deterioration throughout the listed elements replacement of structure is recommended in 1 to 5 years. The full extent of the rehabilitation required to address some of the elements, in particular the deck, will likely be more costly than replacing the bridge in it's entirety. An enhanced OSIM should be carrier out in 2020 to determine the extent of deterioration of the girders, piers and soffit.

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 1: North Approach Looking at Structure

Photo 2: South Approach – Medium to Severe Cracking, Light to Medium Ravelling and Asphalt Patch

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 3: West Railing System

Photo 4: East Railing System – Collision Damage

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 5: Northwest Concrete End-Post – Medium Scaling, Light Spalling and Light Abrasions

Photo 6: Southeast Hazard Sign

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 7: Exposed Concrete Wearing Surface

Photo 8: North End of Deck – Severe Delaminations, Light Spalling and Medium to Wide Cracking

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 9: East Exterior Girder – Light to Medium Corrosion

Photo 10: Northwest Girder End and Steel Bearing – Light to Medium Corrosion

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 11: Southeast Girder End – Light Corrosion and Excessive Debris on Bearing Seat

Photo 12: Northwest Bearings – Medium Corrosion and Deformations

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 13: Interior Soffit, Stringers and Floor Beams

Photo 14: East Exterior Soffit – Light Delaminations and Hairline to Narrow Cracking

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 15: North Beam Ends, Ballast Wall and Stringers

Photo 16: South Pier System – Light to Medium Corrosion

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 17: Northwest Pile Bent Connection – Severe Corrosion with Section Loss

Photo 18: Northeast Pier Footing and Pedestal – Light to Medium Scaling and Medium to Wide Cracking

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 19: Northeast Pier Pedestal and Bent Connection – Wide Crack and Medium to Severe Corrosion

Photo 20: North Abutment Wall – Severe Delaminations, Wide Cracking, Severe Scaling and Disintegration

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 21: North Abutment on the East End – Severe Delaminations and Severe Erosion and Disintegration

Photo 22: Southwest Wingwall – Light to Medium Scaling

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

Photo 23: Northeast Wingwall – Severe Erosion, Scaling and Disintegration

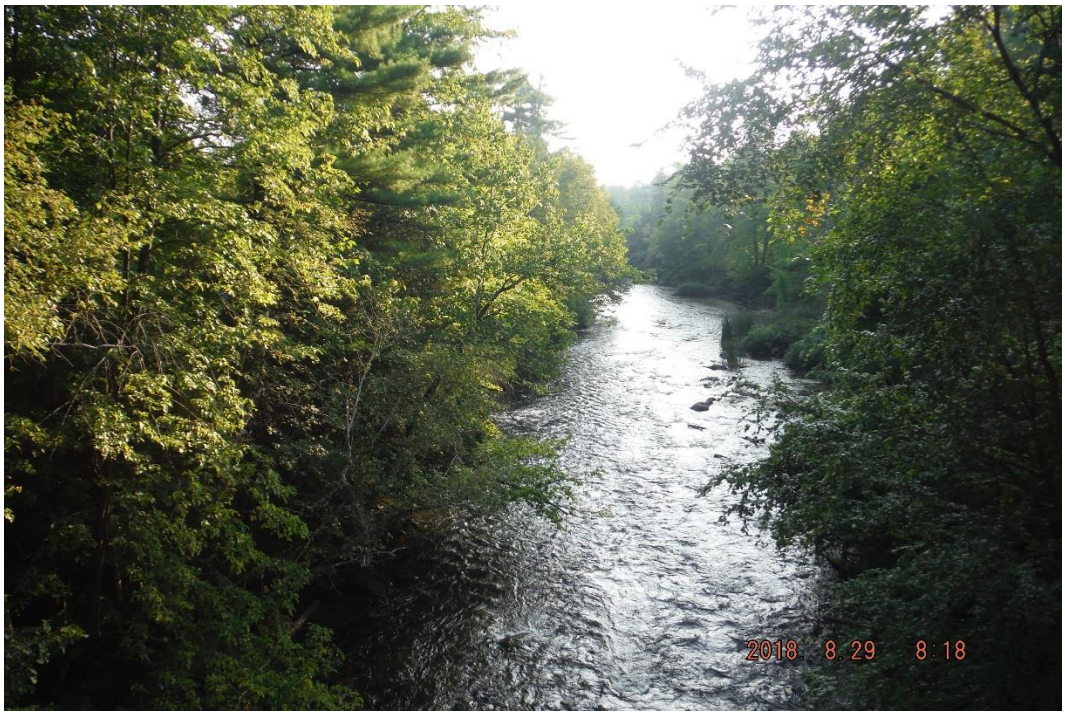

Photo 24: Stream Looking East - Outlet

REPRESENTATIVE PHOTOGRAPHS

Owner: Tay Valley Township
Hwy/Road Name: Crow Lake Road

Structure Name: Bolingbroke Bridge
Location: 0.1 km West of Bolingbrook Road

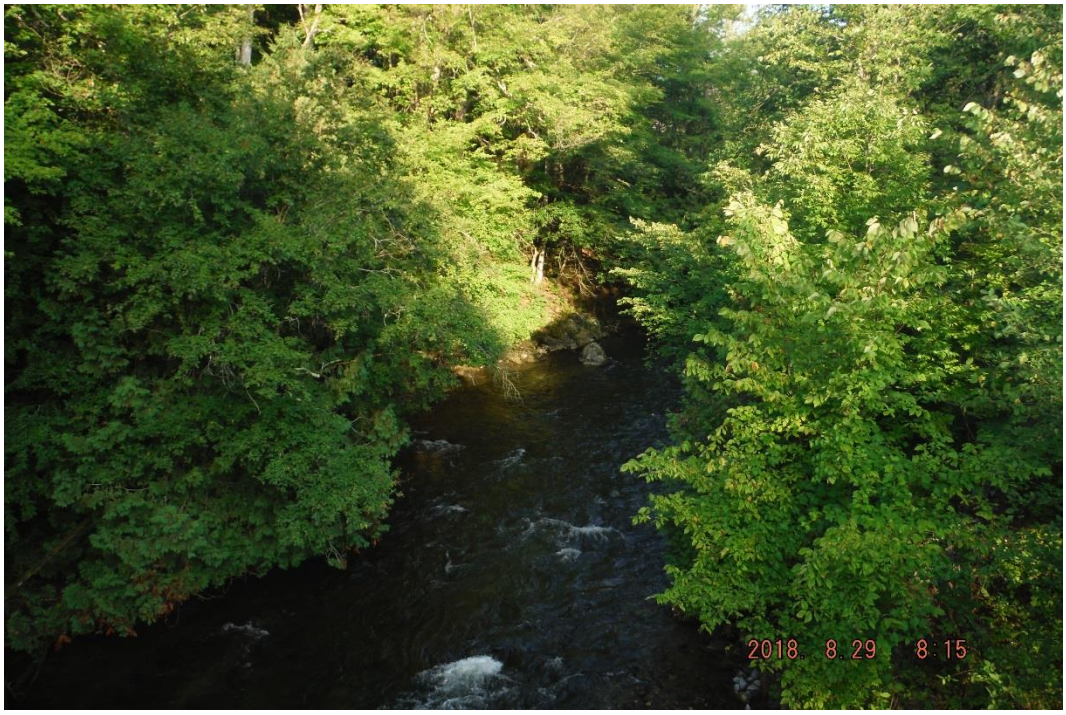

Photo 25: Stream Looking West - Inlet