

To: Development Services Committee

From: Warren Munro, HBA, RPP, Commissioner,
Development Services Department

Report Number: DS-22-77

Date of Report: April 6, 2022

Date of Meeting: April 11, 2022

Subject: Midtown Mall Pedestrian Bridge over Oshawa Creek

Ward: Ward 4

File: 03-05

1.0 Purpose

On September 27, 2021, City Council considered the following Notice of Motion CS-21-81 and referred it to Engineering Services staff for a report back to the Development Services Committee:

“Whereas the bridge over Oshawa Creek and the path behind City Hall has rotting and uneven floor boards and bricks, and missing and rotting railing boards;

Whereas in the deteriorated state of these paths of travel make it not only unsightly, but unsafe and not accessible;

Now therefore staff report on a renewal plan for the cladding elements of bridge and the design and materials of the pathway behind City Hall over Oshawa Creek and report back to Council for a remediation plan that make this path of travel safer and more accessible.”

The purpose of this Report is to provide background information, and a proposed work plan moving forward related to the Midtown Mall pedestrian bridge (the “Bridge”) over Oshawa Creek behind City Hall and the attached pathway to the east of the Bridge.

Attachment 1 shows the location of the Bridge, City Hall, the Midtown Mall, the Robert McLaughlin Gallery and also shows existing zoning in the area.

Attachment 2 is an excerpt of the 2021 Biennial Structural Inspection Report including the cover page prepared by T.S.I. Inc.

2.0 Recommendation

That the Development Services Committee recommend to City Council that Report DS-22-77 dated April 6, 2022 concerning the Midtown Mall pedestrian bridge over the Oshawa Creek be received for information.

3.0 Executive Summary

Not Applicable.

4.0 Input From Other Sources

The following have been consulted in the preparation of this Report:

- Commissioner, Community Services

5.0 Analysis

5.1 Maintenance Activities (Community Services – Operations and Parks)

Minor maintenance of pedestrian bridges (uneven floor boards, rotting handrails, vandalism repair, trip ledges, etc.) falls within the responsibilities of the Community Services Department.

In 2021, Parks Facilities Maintenance staff performed work on the deteriorated deck boards on the Bridge, removed graffiti from the bridge decking, handrails and bridge abutments. This work was undertaken under a normal course of business and as a result of regular maintenance inspections.

In addition to regular maintenance inspections, staff also attend the Bridge to replace deck boards, respond to vandalism (including graffiti, fire damage and structural damage), replace hand rails and address concerns brought forward by the public.

5.2 Structural Elements

Whole structure renewal and replacement of pedestrian bridges falls within the responsibility of Engineering Services.

In accordance with Ontario Regulation 104/97 – Standards for Bridges, the structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer (“O. Reg. 472/10, s. 2”).

The City’s biennial structural inventory was conducted according to the procedures set forth in the Ontario Structure Inspection Manual (“O.S.I.M.”). The O.S.I.M. provides a uniform inspection approach for all bridges and culverts in Ontario with a span of 3.0 metres (9.8 ft.) or greater.

The 2021 O.S.I.M. report for the Bridge identified the following:

- Built in 1970;
- 23 metres (75.4 ft.) long by 2.2 metres (7.2 ft.) wide;
- Timber slab/timber girders/concrete abutments;
- Timber railings and deck boards;
- Structural components are generally in fair condition;
- The remaining service life is estimated at 10 years;
- Major rehabilitation work on the Bridge has not been undertaken since it was built;
- Major rehabilitation is recommended to replace corroded connections of diaphragms, and bridge barriers, and concrete repair to abutments is required;
- Rehabilitation is recommended to replace deck timber planks in the 1 to 5 year time frame;
- Maintenance repair to implement erosion control measures on embankments is recommended; and,
- Evidence of wide cracks and delamination on wingwalls, spall and wide cracks on ballast walls, severe spall with exposed rusted rebar and wide cracks and delamination on abutment walls, severe corrosion on diaphragm connections, severe weathering and split and checks on deck top and bridge barrier, and medium erosion on all embankments.

5.3 Current Work Program

5.3.1 Community Services – Parks Facilities Maintenance

The 2022 Budget included funding for general maintenance items (loose boards, vandalism, etc.).

The overall surfacing of the Bridge is a challenge to maintain and staff are constantly reattaching deck boards. As the replacement boards are milled and expensive, structure replacement is recommended by Parks Facilities Maintenance staff as a long term solution.

5.3.2 Development Services - Engineering

Based on the findings within the 2021 Biennial Structure Inspection report, the design of the replacement structure is currently planned in 2025 subject to Budget approval. This timing is within the expected lifecycle of the Bridge.

5.4 Co-ordination with Other Adjacent Works

The following are additional planned Capital projects in proximity to City Hall that are closely aligned in the capital forecast:

- City Hall Asphalt Parking Lot Review and Replacement;
- Active Transportation Master Plan trail circulation review; and,
- Internal pathway circulation review and replacement.


These projects are all tied to assets that are nearing the end of their respective lifecycles and they all dependent on each other from a programming and functional perspective. There would be a benefit to reviewing and designing these together through a single comprehensive process. Such a comprehensive process would allow for proper design integration and phasing of construction. However, there would be more 'front end' coordination and design work involved. Staff will advance a coordinated approach to renewing various capital improvements in proximity to City Hall in future capital budget submissions.

6.0 Relationship to the Oshawa Strategic Plan

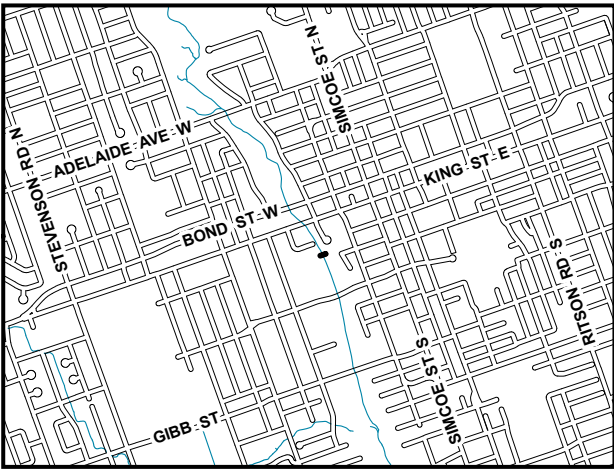
The Recommendation in this Report advances the Accountable Leadership and Economic Prosperity and Financial Stewardship goals of the Oshawa Strategic Plan.



Anthony Ambra, P.Eng., Director,
Engineering Services



Warren Munro, HBA, RPP, Commissioner,
Development Services Department



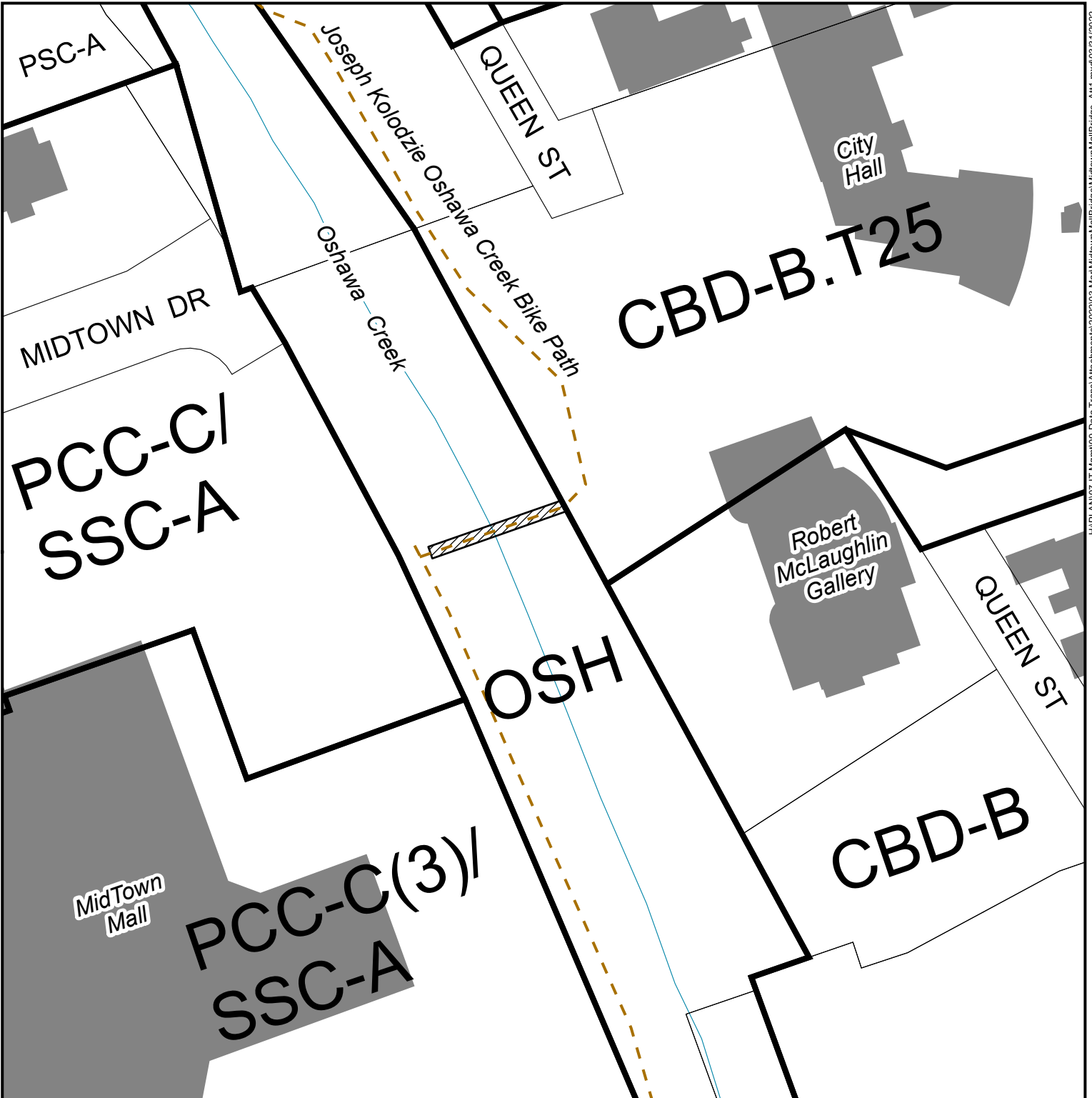
Item: DS-22-77
Attachment 1

Development Services Department

Subject: Midtown Mall Pedestrian Bridge
over Oshawa Creek
Ward: Ward 4
File: 03-05



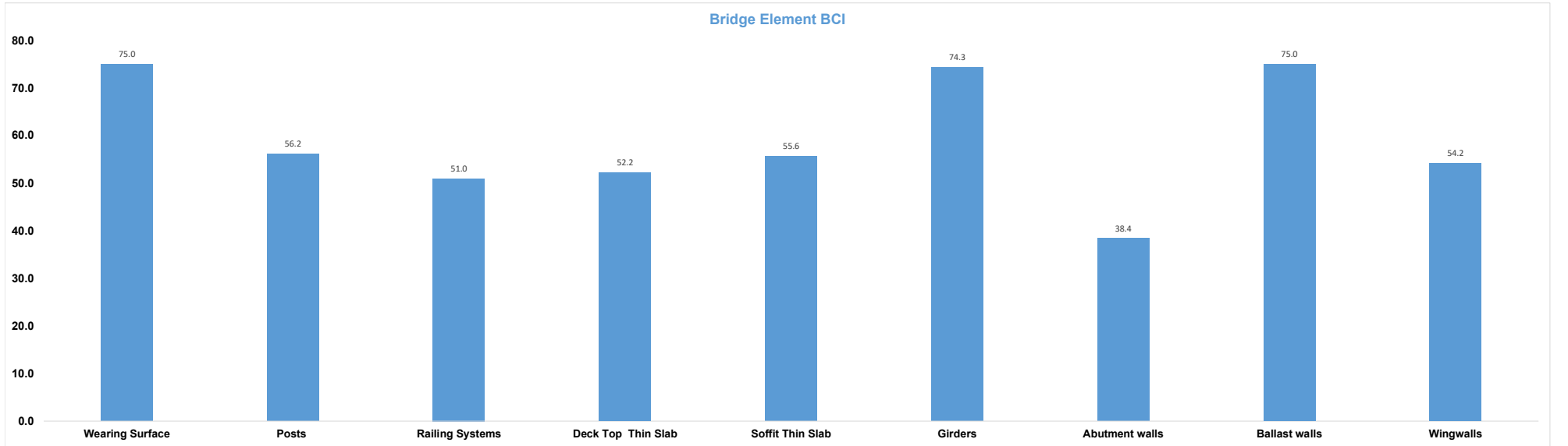
MidTown Mall Pedestrian Bridge 
Public Trails 



Structure Condition Summary Form				Bridge Condition Index (BCI): <u>57.9</u>			
Structure Name:	Midtown Mall Pedestrian Footbridge Over Oshawa Creek			I_t	Importance Factor for Traffic		
Structure Number:	MS-3-2011			I_e	Importance Factor for Economic Impact		
Date of Inspection:	August 16, 2021			I_w	Importance Factor for Bridge Width		
Assignment #:	21038			I_p	Importance Factor for Bridge Profile or Alignment		
Consultant:	TSI Inc.			Bridge Sufficiency Index: <u>57.9</u>			

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Element Qty. in Good Condition (0.75)	Element Qty. in Fair Condition (0.40)	Element Qty. in Poor Condition (0.00)	Total Replacement Value (TRV)	Current Element Value (CEV)	Condition Index (ECI)	Performance Deficiency	Maintenance Need
Approaches	Wearing Surface	Sq. m	6.0	8.8		8.8			52.8	39.6	75.0		
Barriers	Posts	Ea.	100.0	30.0		15.0	14.0	1.0	3000.0	1685.0	56.2		
	Railing Systems	m.	200.0	46.8		15.8	30.0	1.0	9360.0	4770.0	51.0		
Decks	Deck Top Thin Slab	Sq. m	120.0	51.5		22.5	25.0	4.0	6180.0	3225.0	52.2		
	Soffit Thin Slab	Sq. m	120.0	51.5		23.0	28.5		6180.0	3438.0	55.6		
Beams / Main Longitudinal Elements	Girders	Sq. m	150.0	99.2		97.2	2.0		14880.0	11055.0	74.3		
Abutments	Abutment walls	Sq. m	900.0	6.2		2.0	2.2	2.0	5580.0	2142.0	38.4		
	Ballast walls	Sq. m	350.0	0.9		0.9			315.0	236.3	75.0		
	Wingwalls	Sq. m	350.0	15.6		8.6	5.0	2.0	5460.0	2957.5	54.2		
Total:									51007.8	29548.4	57.9		

Note: Sections including bearings, diaphragms, deck drains, expansion joint sealants, embankments, foundations, stringers, streams, and accessories were not included as they do not impact the calculation.



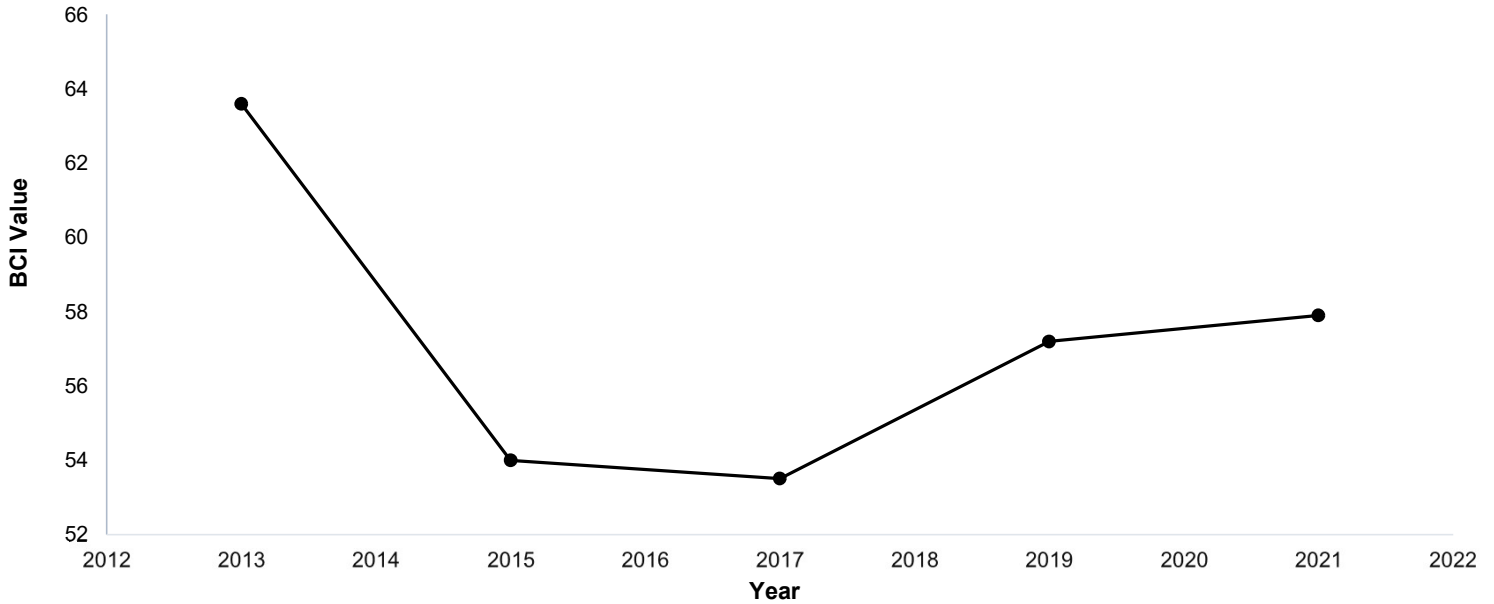
Inventory Data:																			
Structure Name: MIDTOWN MALL PEDESTRIAN FOOTBRIDGE OVER OSHAWA CREEK																			
Main Hwy/Road #:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">On structure</td><td style="width: 50%; padding: 2px;"></td></tr> <tr><td style="padding: 2px;">Under structure</td><td style="padding: 2px;"></td></tr> </table>	On structure		Under structure		Services on structure:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">Navig. Water</td><td style="width: 50%; padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Rail</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Non-Navig. Water</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Road</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Ped.</td><td style="padding: 2px;"><input checked="" type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Other</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> </table>	Navig. Water	<input type="checkbox"/>	Rail	<input type="checkbox"/>	Non-Navig. Water	<input type="checkbox"/>	Road	<input type="checkbox"/>	Ped.	<input checked="" type="checkbox"/>	Other	<input type="checkbox"/>
On structure																			
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Non-Navig. Water	<input type="checkbox"/>																		
Road	<input type="checkbox"/>																		
Ped.	<input checked="" type="checkbox"/>																		
Other	<input type="checkbox"/>																		
Structure Location: 0.01 km E of Midtown Mall Parking Lot		Services under structure:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">Navig. Water</td><td style="width: 50%; padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Rail</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Non-Navig. Water</td><td style="padding: 2px;"><input checked="" type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Road</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Ped.</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Other</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> </table>	Navig. Water	<input type="checkbox"/>	Rail	<input type="checkbox"/>	Non-Navig. Water	<input checked="" type="checkbox"/>	Road	<input type="checkbox"/>	Ped.	<input type="checkbox"/>	Other	<input type="checkbox"/>				
Navig. Water	<input type="checkbox"/>																		
Rail	<input type="checkbox"/>																		
Non-Navig. Water	<input checked="" type="checkbox"/>																		
Road	<input type="checkbox"/>																		
Ped.	<input type="checkbox"/>																		
Other	<input type="checkbox"/>																		
Latitude: 43.89502642	Longitude: -78.86694808	Owner/Custodian: Oshawa																	
MTO Region: Central	Heritage Designation:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">Not Cons.</td><td style="width: 50%; padding: 2px;"><input checked="" type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Desig./not List</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Cons./not App.</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Desig. & List</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">List/not Desig.</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> </table>	Not Cons.	<input checked="" type="checkbox"/>	Desig./not List	<input type="checkbox"/>	Cons./not App.	<input type="checkbox"/>	Desig. & List	<input type="checkbox"/>	List/not Desig.	<input type="checkbox"/>	MTO District: Central Region						
Not Cons.	<input checked="" type="checkbox"/>																		
Desig./not List	<input type="checkbox"/>																		
Cons./not App.	<input type="checkbox"/>																		
Desig. & List	<input type="checkbox"/>																		
List/not Desig.	<input type="checkbox"/>																		
Old County: Ontario	Hwy Class:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">Freeway</td><td style="width: 50%; padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Collector</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Arterial</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Local</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> </table>	Freeway	<input type="checkbox"/>	Collector	<input type="checkbox"/>	Arterial	<input type="checkbox"/>	Local	<input type="checkbox"/>	Posted Speed: <input type="text"/>								
Freeway	<input type="checkbox"/>																		
Collector	<input type="checkbox"/>																		
Arterial	<input type="checkbox"/>																		
Local	<input type="checkbox"/>																		
Township: 3	AADT: <input type="text"/>	Inspection Route Sequence: <input type="text"/>	No. of Lanes: 1																
Structure Type: Timber Slab on Timber Girders	Interchange Number: <input type="text"/>	% Trucks: <input type="text"/>	Interchange Structure Number: <input type="text"/>																
Total Deck Length: 23.40 m	Min. Vertical Clearance: <input type="text"/> m	Special Routes:																	
Overall Str. Width: 2.20 m	Detour Length Around Bridge: <input type="text"/> km	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width: 50%; padding: 2px;">Transit</td><td style="width: 50%; padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">School</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Truck</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> <tr><td style="padding: 2px;">Bicycle</td><td style="padding: 2px;"><input type="checkbox"/></td></tr> </table>	Transit	<input type="checkbox"/>	School	<input type="checkbox"/>	Truck	<input type="checkbox"/>	Bicycle	<input type="checkbox"/>	Traffic Directional Bound: East/West								
Transit	<input type="checkbox"/>																		
School	<input type="checkbox"/>																		
Truck	<input type="checkbox"/>																		
Bicycle	<input type="checkbox"/>																		
Total Deck Area: 51.48 sq. m	Fill on Structure: <input type="text"/> m	Skew Angle: <input type="text"/> Degrees																	
Culvert Length: <input type="text"/> m	No. of Spans: 1.0																		
Roadway Width: 2.1 m	Span Lengths: <input type="text"/> 22.80 m																		

Historical Data:			
Year Built:	<input type="text" value="1970"/>	Year of Last Major Rehabilitation:	<input type="text"/>
Last Regular OSIM Inspection:	<input type="text" value="2019"/>	Year of Last Minor Rehabilitation:	<input type="text"/>
Last Enhanced OSIM Inspection:	<input type="text"/>	Year of Last Bridge Evaluation:	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.):	<input type="text"/>	Current Load Limit:	<input type="text"/> tons
Last Underwater Inspection:	<input type="text"/>	Load Limit By-Law #:	<input type="text"/>
Last Condition Survey:	<input type="text"/>	By-Law Expiry Date:	<input type="text"/>

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Regular OSIM		2021	57.9		
Regular OSIM		2019	57.2		
Regular OSIM		2017	53.51		
Regular OSIM		2015	54		
Regular OSIM		2013	63.59		



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

Field Inspection Information:			
Date of Inspection:	August 16, 2021	Type of Inspection:	<input checked="" type="checkbox"/> Reg. OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Ramin Rameshni, PhD, P.Eng.		
Others in Party:	Saber Teimoori, EIT; Moein Rezaei, Bilal Liaquat		
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.		
Weather:	Overcast		
Temperature:	26 °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:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
	Monitoring of Deformations, Settlements and Movements:	X	
	Monitoring of Crack Widths:	X	
Investigation Notes:			
Overall Structure Notes:			
Recommended Work on Structure:	<input type="checkbox"/> None	<input type="checkbox"/> Minor Rehab.	<input checked="" type="checkbox"/> Major Rehab. <input type="checkbox"/> Replace
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years	<input checked="" type="checkbox"/> 6 to 10 years	
Overall Comments:	Structure is generally in fair condition. Evidence of wide cracks and delamination on wingwalls, spall and wide cracks on ballast walls, severe spall with exposed rusted rebar and wide cracks and delamination on abutment walls, severe corrosion on diaphragm connections, severe weathering and split and checks on deck top and bridge barrier, and medium erosion on all embankments was noted. Major rehabilitation is recommended to replace corroded connections of diaphragms, deck timber planks and bridge barrier, and conduct concrete repair to abutments. Moreover, maintenance repair to implement erosion control measures on embankments is recommended.		
Date of Next Inspection:	2023		

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/Wall drainage

- 12 Slippery surfaces
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other Performance Deficiencies

Maintenance Needs:

- 01 Lift and Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Railing System Repair
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair of Bridge Concrete
- 09 Repair of Bridge Timber
- 10 Work for Modular Bridges
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Works for Drainage System
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other Maintenance

Element Group:	Approaches		Length:	2.00		
Element Name:	Wearing Surface		Width:	2.20		
Location:	West Approaches to Structure		Height:			
Material:	Asphalt		Count (items):	1		
Element Type:	Asphalt Wearing Surface		Total Quantity:	4.40 m ²		
Environment:	Severe		Limited Inspection:			
Protection System:	None					
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies
	m ²		4.40			00
Comments:	• Generally in good condition.					
Recommended Work:	Rehab		Replace	Maintenance Needs:		00
	1-5 years		6-10 years	Urgent	1 year	2 years

Element Group:	Approaches		Length:	2.00		
Element Name:	Wearing Surface		Width:	2.20		
Location:	East Approaches to Structure		Height:			
Material:	Other		Count (items):	1		
Element Type:	Concrete Tile		Total Quantity:	4.40 m ²		
Environment:	Severe		Limited Inspection:			
Protection System:	None					
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies
	m ²		4.40			00
Comments:	• Generally in good condition.					
Recommended Work:	Rehab		Replace	Maintenance Needs:		00
	1-5 years		6-10 years	Urgent	1 year	2 years

Element Group:	Barriers		Length:	23.40			
Element Name:	Railing Systems		Width:	0.04			
Location:	North & South Side of Structure		Height:	0.09			
Material:	Wood		Count (items):	2.00			
Element Type:	Timber Railing		Total Quantity:	46.80		m	
Environment:	Severe		Limited Inspection:				
Protection System:	None					Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*		
	m		15.80	30.0	1.0	00	
Comments:	<ul style="list-style-type: none"> Evidence of medium to severe weathering and medium split and checks was noted. Barrier system was noted substandard. 						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:		00
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent	1 year	2 years
<ul style="list-style-type: none"> To replace bridge barrier. 							

Element Group:	Barriers		Length:				
Element Name:	Posts		Width:				
Location:	North & South Side of Structure		Height:				
Material:	Wood		Count (items):	30			
Element Type:	Wood Posts		Total Quantity:	30.0		Each	
Environment:	Severe		Limited Inspection:				
Protection System:	Paint					Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*		
	Each		15.0	14.0	1.0	00	
Comments:	<ul style="list-style-type: none"> Evidence of weathering and medium checks on all posts. Evidence of section loss at southeast post. 						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:		00
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent	1 year	2 years
<ul style="list-style-type: none"> To replace bridge barrier. 							

Element Group:	Joints				Length:	1.80			
Element Name:	Seals/Sealants				Width:				
Location:	On Top of Abutments				Height:				
Material:	Plastic				Count (items):	2.0			
Element Type:	Strip Seal				Total Quantity:	2.0		Each	
Environment:	Severe				Limited Inspection:				
Protection System:	None								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each			2.0		00			
Comments:	• Evidence of minor to medium bulging was noted.								
Recommended Work:	Rehab		Replace	Maintenance Needs:		00			
	1-5 years		6-10 years	Urgent	1 year	2 years			

Element Group:	Decks				Length:	23.40			
Element Name:	Deck Top				Width:	2.20			
Location:	Top of Deck				Height:				
Material:	Timber				Count (items):				
Element Type:	Transverse Timber Planks				Total Quantity:	51.50		m ²	
Environment:	Severe				Limited Inspection:				
Protection System:	None								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m ²		22.50	25.00	4.00	00			
Comments:	• Evidence of severe weathering, medium to severe split and check, and localized medium rot was noted.								
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:		00		
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent	1 year	2 years		
• To replace deck top.									

Element Group:	Decks		Length:	23.40		
Element Name:	Soffit – Thin Slab		Width:	2.20		
Location:	Underside of Structure		Height:			
Material:	Timber		Count (items):			
Element Type:	Transverse Timber Planks		Total Quantity:	51.50		m ²
Environment:	Moderate		Limited Inspection:			
Protection System:	None					Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*	
	m ²		23.00	28.50		00
Comments:	<ul style="list-style-type: none"> Evidence of medium rot and medium split and checks was noted. 					
Recommended Work:		Rehab		Replace	Maintenance Needs:	00
		1-5 years		6-10 years	Urgent	1 year 2 years

Element Group:	Beams/Main Longitudinal Element (MLE'S)		Length:	23.40		
Element Name:	Girders		Width:	0.28		
Location:	Underside of Structure		Height:	0.92		
Material:	Wood		Count (items):	2.0		
Element Type:	Rectangular Timber Girders		Total Quantity:	99.20		m ²
Environment:	Benign		Limited Inspection:			
Protection System:	None					Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*	
	m ²		97.20	2.00		00
Comments:	<ul style="list-style-type: none"> Evidence of minor to medium split and check was noted. 					
Recommended Work:		Rehab		Replace	Maintenance Needs:	00
		1-5 years		6-10 years	Urgent	1 year 2 years

Element Group:	Beams/Main Longitudinal Element (MLE'S)		Length:				
Element Name:	Diaphragms		Width:				
Location:	Underside of Structure		Height:				
Material:	Wood		Count (items):	5.0			
Element Type:	Timber Diaphragm		Total Quantity:	5.0		Each	
Environment:	Benign		Limited Inspection:				
Protection System:	None					Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*		
	Each			3.0	2.0	00	
Comments:	<ul style="list-style-type: none"> Evidence of minor rot on timber diaphragms, and severe corrosion on steel connections was noted. 						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:		00
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent	1 year	2 years
<ul style="list-style-type: none"> To replace diaphragm corroded connections. 							

Element Group:	Abutments		Length:	0.3			
Element Name:	Abutment Walls		Width:	2.0			
Location:	East & West Underside of Structure		Height:	1.3			
Material:	Concrete		Count (items):	2			
Element Type:	Reinforced Concrete Walls		Total Quantity:	6.2		m ²	
Environment:	Benign		Limited Inspection:				
Protection System:	None					Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*		
	m ²		2.0	2.20	2.00	00	
Comments:	<ul style="list-style-type: none"> Evidence of wide cracks and delamination on east abutment, and severe spall with exposed rusted rebar, wide cracks and delamination on west abutment was noted. 						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:		00
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent	1 year	2 years
<ul style="list-style-type: none"> To conduct concrete repair to abutments. 							

Element Group:	Abutments				Length:	0.3			
Element Name:	Ballast Walls				Width:	0.8			
Location:	East & West Underside of Structure				Height:	0.3			
Material:	Concrete				Count (items):	4			
Element Type:	Reinforced Concrete Wall				Total Quantity:	0.9		m ²	
Environment:	Benign				Limited Inspection:				
Protection System:	None								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m ²		0.9			00			
Comments:	<ul style="list-style-type: none"> Evidence of spalls patched with asphalt and wide cracks on west and wide cracks and rust stain on east ballast wall was noted. 								
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:			00	
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent		1 year	2 years	
<ul style="list-style-type: none"> To conduct concrete repair to ballast walls. 									

Element Group:	Abutments				Length:	2.3			
Element Name:	Wingwalls				Width:	0.3			
Location:	NE, NW, SW & SE Side of Structure				Height:	1.7			
Material:	Cast-in-Place Concrete				Count (items):	4.0			
Element Type:	Reinforced Concrete Walls				Total Quantity:	15.6		m ²	
Environment:	Benign				Limited Inspection:				
Protection System:	None								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m ²		8.6	5.0	2.0	00			
Comments:	<ul style="list-style-type: none"> Evidence of wide cracks and delamination was noted on abutments around barriers connection bases. 								
Recommended Work:	<input checked="" type="checkbox"/>	Rehab		Replace	Maintenance Needs:			00	
	<input checked="" type="checkbox"/>	1-5 years		6-10 years	Urgent		1 year	2 years	
<ul style="list-style-type: none"> To conduct concrete repair to wingwalls. 									

Element Group:	Foundations				Length:				
Element Name:	Foundation (Below Ground Level)				Width:				
Location:	Below Abutments & Wingwalls				Height:				
Material:	Unknown				Count (items):	All			
Element Type:	Unknown				Total Quantity:	All		N/A	
Environment:	Benign				Limited Inspection:	<input checked="" type="checkbox"/>			
Protection System:	Unknown								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	N/A		All			00			
Comments:	<ul style="list-style-type: none"> • Foundations are rated for performance only and not material condition. • No visible evidence of foundation instability was noted during the inspection. 								
Recommended Work:	Rehab		Replace	Maintenance Needs:		00			
	1-5 years		6-10 years	Urgent		1 year		2 years	

Element Group:	Embankments and Streams				Length:				
Element Name:	Embankments				Width:				
Location:	NE, NW, SE & SW of Structure				Height:				
Material:	Gravel				Count (items):	4			
Element Type:	Embankment				Total Quantity:	4.0		Each	
Environment:	Moderate				Limited Inspection:				
Protection System:	Vegetation								Perform. Deficiencies
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each			4.0		00			
Comments:	<ul style="list-style-type: none"> • Evidence of medium erosion on all embankment was noted. 								
Recommended Work:	Rehab		Replace	Maintenance Needs:		13			
	1-5 years		6-10 years	Urgent	<input checked="" type="checkbox"/>	1 year		2 years	
<ul style="list-style-type: none"> • To implement erosion control measures on all the embankments. 									

Element Group:	Embankments and Streams			Length:		
Element Name:	Slope Protection			Width:		
Location:	NE, NW, SE & SW of Structure			Height:		
Material:	Vegetation			Count (items):	4	
Element Type:	Slop Protection			Total Quantity:	4.0 Each	
Environment:	Moderate			Limited Inspection:		
Protection System:	None				Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair		Poor*
	Each			4.0	00	
Comments:	• Evidence of medium erosion on all embankment was noted.					
Recommended Work:		Rehab		Replace	Maintenance Needs:	00
		1-5 years		6-10 years	Urgent	1 year 2 years

Element Group:	Embankments and Streams			Length:		
Element Name:	Streams and Waterways			Width:		
Location:	Below Structure			Height:		
Material:	Native			Count (items):	All	
Element Type:	Stream			Total Quantity:	All N/A	
Environment:	Benign			Limited Inspection:		
Protection System:	None				Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair		Poor*
	N/A		All		00	
Comments:	• High volume and flow from north to south with no visible obstruction was noted.					
Recommended Work:		Rehab		Replace	Maintenance Needs:	00
		1-5 years		6-10 years	Urgent	1 year 2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 3 : Pathway Looking West



Figure 4 : Pathway Looking East

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 5 : East Bridge End Condition (Typ.)_Evidence of Medium to Wide Map Cracking & Rust Stain on Ballast Wall



Figure 6 : Asphalt Wearing Surface Condition over West Approach (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 7 : South Bridge Barrier (Typ.)

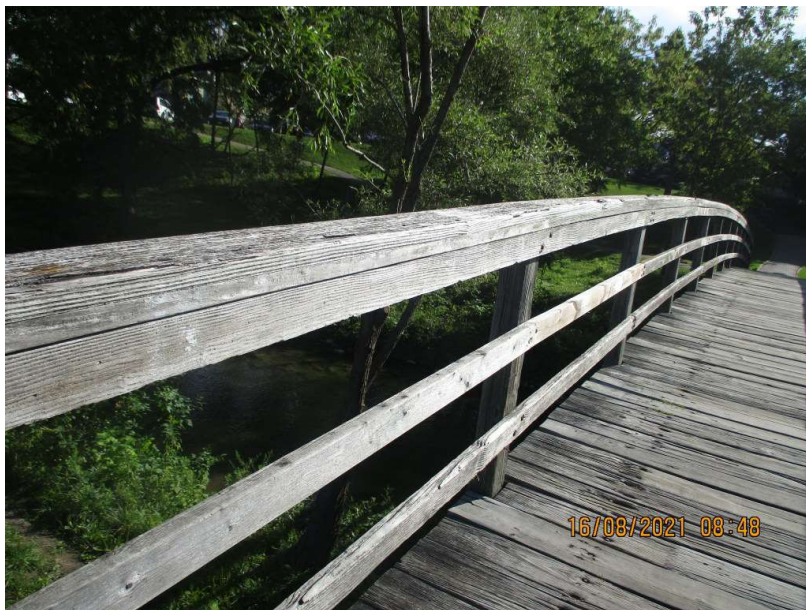


Figure 8 : North Bridge Barrier (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 9 : NW Wingwall_Evidence of Wide Cracks & Rust Stain around Barrier Connection to Wingwall



Figure 10 : NE Wingwall_Evidence of Wide Cracks around Barrier Connection

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 11 : SW Wingwall_Evidence of Medium Spall, Wide Longitudinal Crack & Rust Stain



Figure 12 : West Bridge End Condition (Typ.)_Evidence of Spall & Wide Cracks on Exposed Surface of Ballast Wall

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 13 : Deck Top Condition (Typ.)_Evidence of Severe Weathering and Wear & Tear



Figure 14 : South Bridge Barrier Top Face_Evidence of Severe Weathering

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot

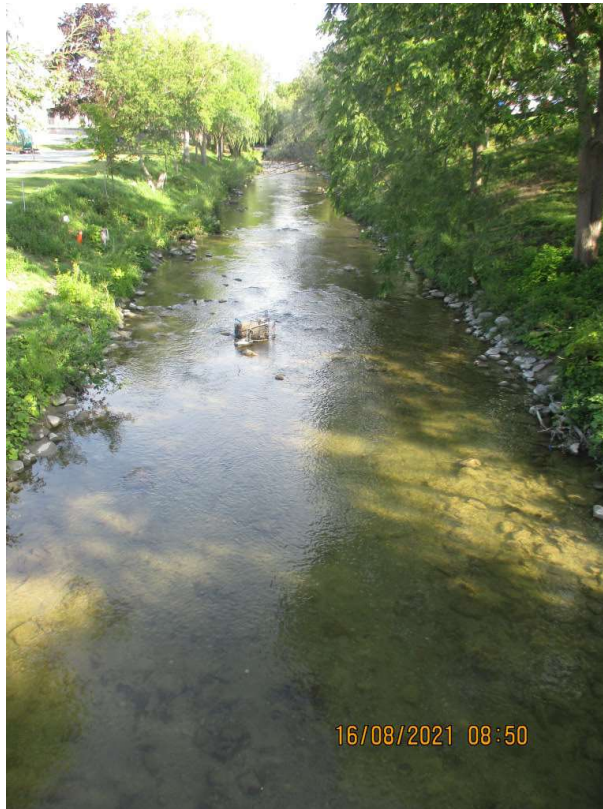


Figure 15 : Stream Looking North (Upstream)



Figure 16 : Stream Looking South (Downstream)

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 17 : Stream Bed Condition (Typ.)



Figure 18 : NW Embankment_Evidence of Medium Erosion

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot

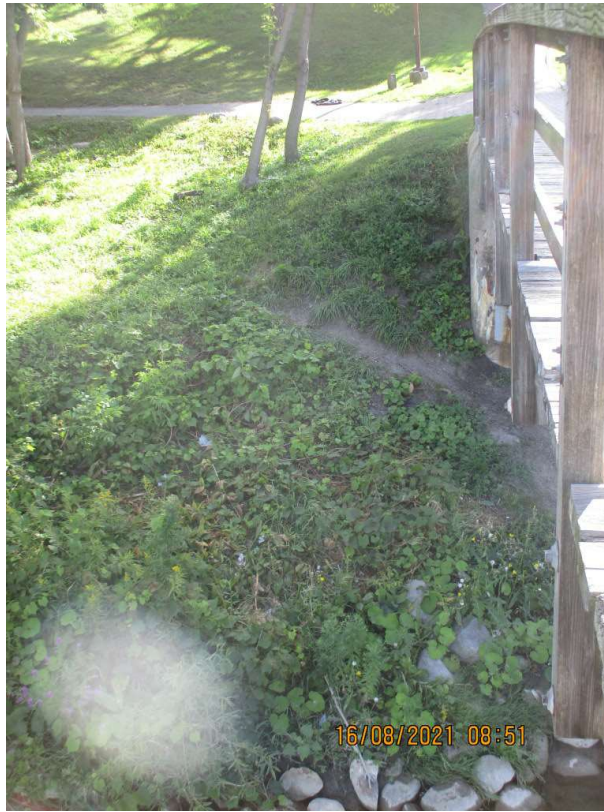


Figure 19 : NE Embankment_Evidence of Medium Erosion

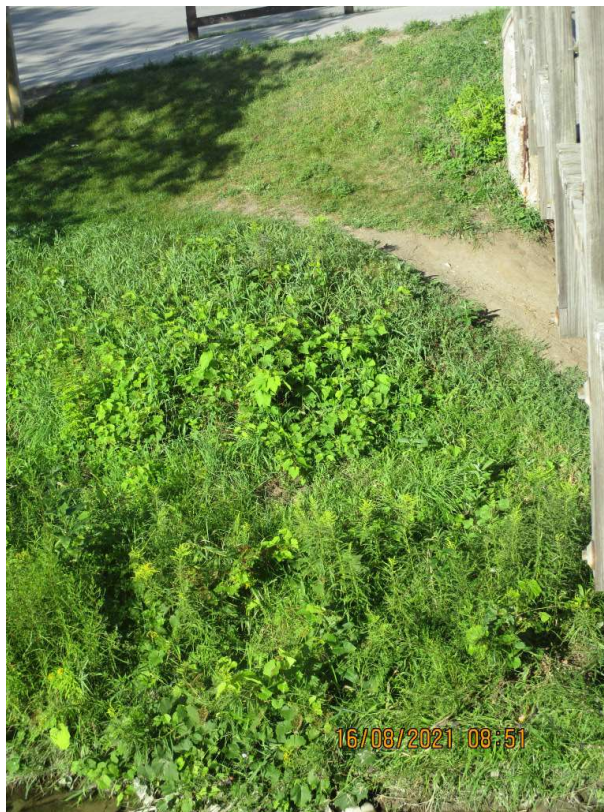


Figure 20 : SE Embankment_Evidence of Medium Erosion

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 21 : SE Embankment_Evidence of Medium Erosion

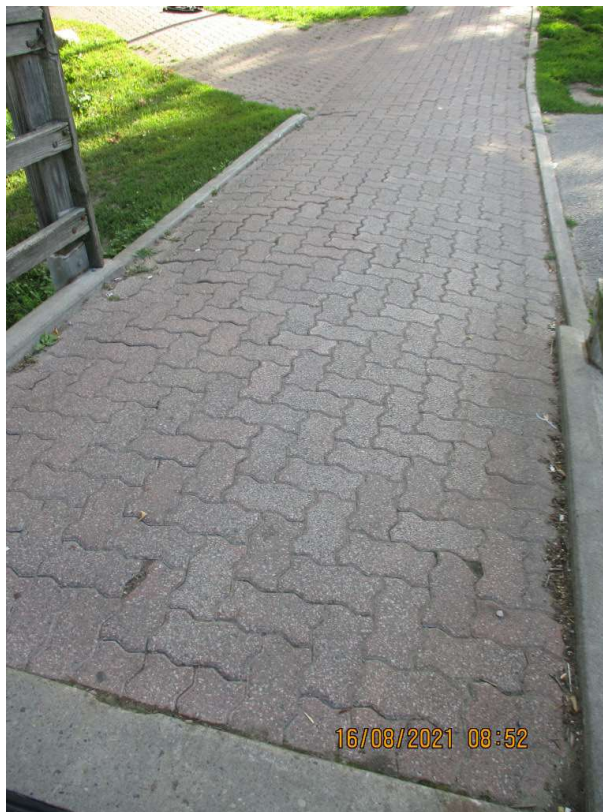


Figure 22 : East Approach (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 23 : SE Corner of Barrier_Evidence of Section Loss



Figure 24 : NE Coener of Barrier_Evidence of Severe Rot

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 25 : East Abutment (Typ.)_ Evidence of Wide Transverse Cracks



Figure 26 : Timber Diaphragm (Typ.)_ Evidence of Severe Corrosion on Connections

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 27 : Exterior Face of Girder (Typ.)



Figure 28 : Post Tensioning Rod Ends_Evidence of Medium to Severe Corrosion

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 29 : Soffit (Typ.)

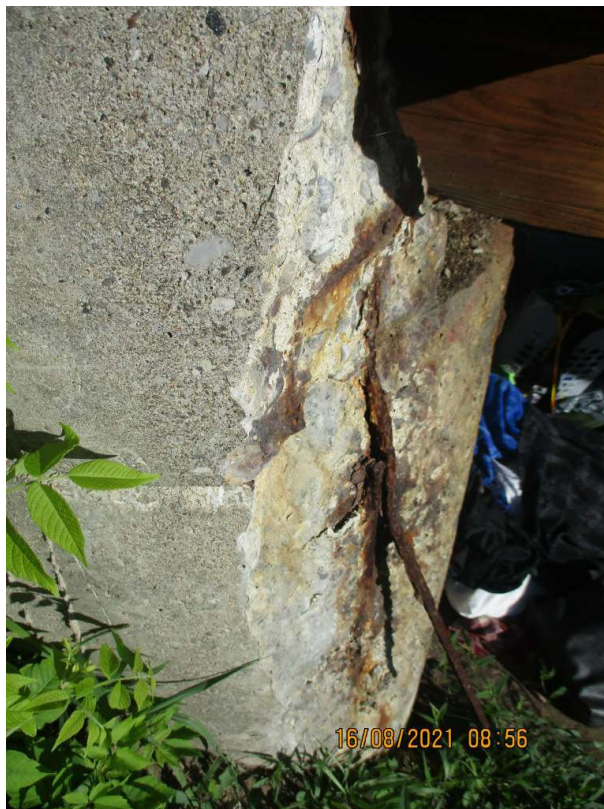


Figure 30 : West Abutment_Evidence of Severe Spall with Exposed Rusted Rebar

REPRESENTATIVE PHOTOGRAPHS

Owner: Oshawa

Hwy/Road Name: N/A

Structure Name: Midtown Mall Pedestrian Footbridge Over Oshawa Creek

Location: 0.01 km E of Midtown Mall Parking Lot



Figure 31 : Approach Barrier_Evidence of Medium Rot



Figure 32 : Approach Barrier (Typ.)