
BIENNIAL OSIM BRIDGE INSPECTION & CAPITAL NEED ANALYSIS

SUMMARY REPORT



TSI PROJECT NO: 24079

September 2025

(Final)



GANANOQUE

Submitted To:

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1.0 Introduction

TSI Inc. was retained by the Corporation of the Town of Gananoque to perform detailed visual inspection of the Municipality's structural culverts and bridges in accordance with the MTO Ontario Structure Inspection Manual (OSIM-2018). The scope of work included carrying out biennial OSIM inspection for three (3) road bridges, ten (10) pedestrian bridges and eleven (11) pedestrian boardwalks in accordance with the requirements of the most recent edition (2018) of MTO OSIM manual. This summary report contains the individual OSIM inspection forms, as well as the Maintenance Needs Plan, and the 10-year (Rehabilitation/Replacement) Capital Plan for all structures inspected.

2.0 Scope of Work

The assignment involved the following:

- A detailed visual inspection of each structure under direct supervision of a Professional Engineer, licensed in the Province of Ontario, and trained by the Ministry of Transportation to do OSIM inspection;
- Generating OSIM inspection reports including representative pictures, observation notes, and comments from the field inspection for each structure;
- Completion of a prioritized list of maintenance needs for each structure and associated cost estimate (in current year dollars);
- Completion of a prioritized list of repairs and/or replacement needs for each structure, and its corresponding capital cost estimate, (in current year dollars);
- A detailed Summary Report presented herein.

3.0 Purpose

It is intended that the results of the assignment will be used by the Municipality to ensure that the following items are properly administrated:

- Ensure that the Municipality's structures remain at an acceptable level of safety;
- Ensure that the useful service life of the structures is prolonged;
- Ensure that maintenance and rehabilitation needs are identified and recorded for future planning;

- Ensure that the Municipality has adequate economic and technical information to effectively plan for additional studies and investigations, repair, and/ or replacement of the structure.

4.0 Structure Inspection

4.1 Methodology

The structures were visually inspected in accordance with the MTO Ontario Structure Inspection Manual (OSIM). To achieve the goals and objectives of this assignment, an element-by-element visual assessment of each structure was completed to identify material defects, performance deficiencies, and maintenance needs. The “severity and extent” approach, as outlined in the Preface of the OSIM, was used to simplify the process of using inspection information to estimate bridge rehabilitation needs and costs.

Prior to undertaking visual field inspections, previous OSIM reports were reviewed. A copy of the original drawings, where available, was requested from the Municipality and/or the Ministry of Transportation, Ontario and reviewed prior to the field inspections. The inspection work was completed by three (3) qualified inspectors including an experienced Professional Engineer, licensed in the Province of Ontario. Field inspections were conducted in November 2024 and April 2025. The work was carried out in accordance with the Occupational Health and Safety Act and the requirements of the Ontario Traffic Control Manual Book 7 – Temporary Conditions, where applicable.

Binoculars, camera, tape measures, steel chain, chest waders, flotation vest, hammers, paint markers and other items as listed in Clause 1.4 of Section 1 under Part 2 of OSIM were used to complete the inspections.

During an OSIM inspection, elements of a bridge or culvert are inspected for visual signs of deterioration. Additionally, tactile inspections of accessible concrete elements, such as concrete sounding, are undertaken during an inspection. The tactile inspection uncovers deterioration that is not visually noticeable. The inspection manual provides guidelines for the calculation of the overall quantity of an element. Element quantities are based on the element type and are in units for area (m²), linear distance (m), units (each), etc.

Upon completion of the field inspections the structures were reviewed with regards to their individual maintenance and rehabilitation needs. A thorough review of each structure was completed for prioritizing and making recommendations appropriate for current and future use

requirements. A 10-year Capital Plan has been prepared to outline all replacement and/or rehabilitation recommendations, associated costs, and corresponding recommended timelines for each structure.

All reports and evaluation works have been internally reviewed to ensure accuracy and completeness. Report forms have been completed as per section 7 under Part 2 of OSIM. Budget estimates for recommended work have been based on recent project costs for similar work as well as industry benchmark costs.

4.2 Bridge Condition Index (BCI)

The BCI is calculated using asset management principals based on the remaining economic worth of the bridge. It is based on the premise that a bridge starts at a new condition and deteriorates to a lower condition with time. It uses actual inspection data from the various bridge elements and as the elements deteriorate, they have a lower economic value. Essentially, the BCI is a weighted average of all elements (since all elements are not of equal value to the bridge) and all Condition States (since each condition state represents a certain degree of loss of value of the element). The BCI begins at 100 when the bridge is in new condition and theoretically becomes 0 as all elements become fully in Poor condition. Practically, it is impossible for the BCI to fall to 0 since the entire bridge does not become poor before rehabilitation work is performed.

The BCI is based on the current value and replacement value of all elements in a bridge. The current value of the element is determined based on the depreciated value of the portions of the element that are in each of the four Condition States (Excellent, Good, Fair, and Poor). The following table provides weight factor used for condition states:

Condition State	Weight Factor
Excellent	1
Good	0.75
Fair	0.5
Poor	0.0

The BCI is used to plan repair and maintenance and does not imply for safety of a structure.

5.0 Determination of Costs

Given the cursory information obtained during the visual inspections and without having access to detailed design information, it is unrealistic to develop detailed cost estimates for each structure. For these reasons, benchmark budget costs were developed for categories of repair, rehabilitation and replacement. Usually, benchmark costs do not necessarily provide accurate costs for individual repairs/replacement but have proven to provide adequate accuracy for global budgeting purposes when dealing with a large number of structures.

For the purpose of this study, benchmark costs for the rehabilitation and replacement of structures are based on maintaining the existing width, length and alignment of each structure. However, the costs to replace the existing structures with structures meeting current geometric standards are included for comparison. For this purpose, an overall roadway width of 10 meters was used for both bridges and culverts. More accurate costs for each structure would be provided upon further engineering study and preliminary design based on exact repair, rehabilitation and replacement needs (including change in geometry). The following benchmark costs have been established for this report following the requirements of the inspection forms.

5.1 Bridge and Culvert replacement costs

Budget costs for the replacement of bridges are usually based on the deck surface area of individual structures (m^2). Therefore, benchmark replacement costs for this study were determined using the following unit costs based on the spans of individual bridges. The proposed unit costs are in general conformance with the recommendations of MTO Structural Financial Manual and our recent experience in the field. These unit costs include approach roadway costs (which do not vary with bridge span). In addition, the varying widths of bridges were considered to provide more realistic unit costs and to avoid large discrepancies in the replacement cost between bridges of different lengths, but similar surface areas.

Total Bridge Replacement Unit Costs		
Bridge Length (m)	Width (m)	Unit Replacement Cost (\$/m ²)
3-10	<10m	\$13,500.00
	≥10 m	\$12,500.00
10-20	<10m	\$12,500.00
	≥10 m	\$11,500.00
20-30	<10m	\$11,500.00
	≥10 m	\$10,500.00
>30	<10m	\$10,500.00
	≥10 m	\$9,500.00

In the case of boardwalks, the Unit Replacement Cost (\$/m²) is between \$3,000-10,000.

In the case of culverts, the plan area (or deck surface area) used in the calculation was ('total span' + 1 m) x ('length of culvert'). The purpose of using the Total Bridge Replacement Unit Costs table for culverts is to normalize the replacement cost figures. Although culverts are generally less expensive to construct than bridges, it is generally accepted that the expected service life span of a culvert is typically less than a bridge. It is valid, therefore, on a life cycle cost basis, to utilize the total Bridge Replacement Unit Costs table for all structures, whether they are bridge or culvert type.

5.2 Bridge Repair / Rehabilitation Costs

For budgeting purposes, costs for the rehabilitation of bridges are typically expressed as a percentage of the total replacement costs. Rehabilitation costs for this study are separated into four categories as presented in the table below.

Bridge Rehabilitation Costs	
Category	% of Replacement Cost
Major Bridge Rehabilitation	40-60
Minor Bridge Rehabilitation	20-40
Major Item Repair	10-20
Minor Item Repair	5 or less

5.3 Culvert Repair / Rehabilitation Costs

It is generally not practical to undertake major rehabilitation work to culvert crossings where significant material/performance deficiencies (e.g. metal liner (barrel) perforation or severe erosion of concrete) exist. Culvert replacement is normally planned in these circumstances. Repair work identified generally included repairs to the inlet and outlet structures such as headwalls, cut-off walls, retaining walls, restoration of backfill, slope protection at the culvert ends and installation / upgrading of guiderail. In the case of concrete barrels, some repair work to the barrels may be included if the opening is large enough to permit construction.

5.4 Approach Roadway Repair / Rehabilitation Costs

For this study, approaches are considered to be 30m of roadway from the center of each individual culvert (60 m total per culvert) and 6m of roadway from the end of the deck for each individual bridge (12m total per bridge). Repair / rehabilitation costs for approach roadways have been separated into three categories as presented in the table below.

Separate costs for Approach Roadway Repair / Rehabilitation have been included for Bridge Rehabilitation. For structure replacement costs and repairs, the approach roadway repair / rehabilitation costs have been included in the recommended work costs if applicable.

Approach Roadway Repair/Rehabilitation Costs	
Category	Cost
Capital Projects (Partial / Complete Paving, Guiderail)	\$80,000.00
Minor Repairs / Maintenance (Crack Sealing, Surface Sealing, Guiderail Repairs)	\$30,000.00
Crack Sealing Only	\$15,000.00

5.5 Construction Detour Costs

Several alternatives exist to maintain the flow of traffic when a bridge or culvert undergoes major rehabilitation or replacement. These include construction of a detour structure adjacent to the existing structure, a detour route around (avoiding) the structure, and the staging of the construction to allow traffic on the structure during construction. The construction of a detour structure is the costliest option and is usually recommended only when the other options are not possible. The detour route is the least expensive option but is often not practical due to the length of the detour route and the inconvenience to residents near the structure. The most frequently recommended option is the staging of rehabilitation work to allow the passage of traffic.

Since most bridge projects would consist of rehabilitation and not replacement, the staging of work would be the most frequently used option to maintain traffic during construction. Therefore, the benchmark costs for detours are based on “staging” of the work as per the following. These costs are based on additional costs incurred from staging of the work during construction (extra effort, time). Traffic control costs would be separate from detour costs and are presented later in this section.

Detour During Construction Costs	
Category	Cost
Detour (Minor Rehabilitation / Major Rehabilitation of Bridges Less than 10m Long / Culvert Replacement)	\$40,000.00
Detour (Major Rehabilitation / Bridge Replacement)	\$70,000.00

5.6 Traffic Control Costs

In addition to performing the work in stages to accommodate traffic, the safety of traffic passing on the bridge or over the culvert during construction must also be ensured. The costs of traffic control during staged projects would be as follows:

Traffic Control Costs	
Category	Cost
Traffic Control – Minor Rehabilitation	\$40,000.00
Traffic Control Major Rehabilitation	\$80,000.00

5.7 Utilities / Right of Way Costs

Most bridge or culvert rehabilitation / replacement projects do not require substantial expenses for the installation or modification of existing utilities. Similarly, most of these projects do not require an increase in right of way (ROW). Therefore, specific benchmark budget costs for these items were not developed.

5.8 Environmental Study Cost

Since bridge or culvert replacements / rehabilitations typically do not involve a change in alignment or a reduction in clearances under the structure, these projects usually fall under the Municipal Class Environmental Assessment (MCEA)-Schedule A or A+ for Ontario Municipal Highways. The specific requirement of these two schedules of MCEA do not include detailed environmental and mitigation plans, but typically requires written application with, and permission from, the appropriate environmental agencies (Ontario Ministry of Natural Resources, Ontario

Ministry of the Environment, Local Conservation Authorities (Permit to Take Water), etc.). Therefore, the benchmark budget cost for environmental study would be as follows (based on the requirement of Schedule A or A+ Environmental Assessment):

Environmental study Costs	
Category	Cost
Bridge / Culvert Replacement, Minor and Major Rehabilitation	\$15,000.00

5.9 Engineering Investigation

Further engineering investigation is recommended for several of the bridges and culverts as indicated on individual OSIM inspection forms. Benchmark budget costs for these additional engineering investigation works are presented in the table below:

Engineering Investigation		
Category	Type of Structure	Cost
Detailed Inspection / Rehabilitation Study – Full Bridge	Truss	\$60,000.00
	Other Structures	\$50,000.00
	Traffic Barrier Only*	\$15,000.00
Detailed Deck Condition Survey	Exposed Deck	\$35,000.00
	Asphalt Paved Deck	\$50,000.00
	Concrete Culvert with Height of Fill Less than 500mm**	\$25,000.00
Structure Evaluation	Truss	\$25,000.00
	Other Structures	\$20,000.00
Underwater Investigation	All Bridges	\$20,000.00
Monitoring of Deformation	All Bridges	\$10,000.00

* Requirements for traffic barriers on bridges and culverts were determined using the Canadian Highway Bridge Design Code, MTO Standards and best engineering standard practice. The evaluation of existing traffic barriers was based on assumed values of AADT and good engineering practice. For structures with existing approach guiderail, a review of the required approach / leaving end length of guiderail and end treatments (as per the MTO's Roadside Safety Manual) was not carried out.

** Deck condition survey on concrete culvert includes cores with no corrosion potential survey. Deck condition surveys on concrete culverts with a height of fill greater than 500 mm are not practical.

The benchmark budget costs for a Structure Evaluation and Detailed Deck Condition Survey would be reduced to 50% of that shown in the table above when any one of these are performed simultaneously with a Detailed Inspection / Rehabilitation Study.

Other investigations such as fatigue and seismic investigations would be included with the Detailed Inspection and Structure Evaluation (respectively), if deemed necessary by the engineer. Detailed coating condition surveys are typically only required where a failure of coating systems have occurred other than normal deterioration. A DART (Deck Assessment by Radar Technology) survey is not a commonly used investigation method. Detailed deck condition surveys are the most commonly used method of deck inspection. Therefore, individual costs for the various types of investigation described above are not provided.

5.10 Engineering Design Cost

For the purpose of this report, the "engineering design" associated with each bridge is estimated at 10% of the estimated rehabilitation/replacement cost.

5.11 Contract Administration, Construction Field Inspection and other design Services during Construction

For the purpose of this study, the total cost associated with "Contract Administration, Construction Field Inspection and other Design Services during Construction" is estimated at 15% of the estimated rehabilitation/replacement cost.

5.12 Other Costs

Any other costs not specified in the above (site specific requirements) are deemed to be covered in the total benchmark costs. Therefore, no specific amount for other work is specified in this report.

5.13 Contingency Costs

The benchmark costs used for budgeting purposes are based only on information obtained from visual OSIM inspections; hence, contingency allowances are already built into the benchmark costs. Therefore, specific amounts for contingencies will not be included in this report.

5.14 Total Capital Work Estimate

The total capital work estimate cost will be the sum of all above-noted costs identified under sub-sections 5.1 to 5.13 (where applicable).

6.0 Routine Maintenance

As part of the Municipality's overall bridge management program, a program of routine maintenance should be implemented and upkept for all structures. Maintaining this program will assist in minimizing the potential for premature deterioration of structural elements; and, when combined with a program of bridge rehabilitation, will assist in maximizing the useful service life of the Municipality's structure inventory.

Overall routine maintenance needs will vary depending on the type of structure, location, traffic volumes, winter maintenance procedures (sanding vs. salting, etc.), size of the structure, vintage and previous maintenance / rehabilitation carried out on the structure in the past. The following presents a general summary of routine maintenance operations that are considered applicable for the structures present within the Municipality's inventory:

6.1 Periodic bridge cleaning

This would include power-washing of all components exposed to roadway traffic and areas where debris accumulation is prevalent. This would include asphalt wearing surfaces, expansion joint gaps, edges of roadway, bearing seats, truss bottom chords, etc. Typically, this operation would be carried out on an annual basis, most likely each spring after winter sanding / salting operations have ceased; however, in some cases (i.e. gravel approach roadways, etc.), an increase in the number of cleanings per year may be required.

6.2 Concrete spot repairs

This would generally include localized patching of small concrete spalls and delamination located in areas within the roadway splash zones (top of deck, curbs, expansion joint block-outs, etc.). Completing these repairs will assist in preventing accelerated deterioration of concrete in these areas by reducing the ingress of chlorides, etc. There is no specific timing for these types of repairs, and they are generally performed on an as-needed basis.

6.3 Steel spot repairs / spot coating

This would generally include localized touch-ups to steel coatings located in areas within the roadway splash zones (truss bottom chords, exterior floor beams / stringers, etc.) as well as localized spot repairs in areas of appreciable section loss / corrosion. There is no specific timing for these types of repairs, and they are generally performed on an as-needed basis.

6.4 Clearing of debris in waterway

This would include clearing of trapped debris in the vicinity of the structure (upstream / downstream). This operation would typically be carried out on an annual basis, after the spring run-off period.

6.5 Asphalt surface repairs / rout and seal

This would include cold patch asphalt repairs, routing and sealing of wide cracks in asphalt. This operation would typically be carried out on an annual basis, after winter clearing operations have ceased.

6.6 Regrading of Approach Roadways (Gravel Roadway Surfaces)

This would include placing and grading fresh granular material on roadway surfaces. The timing of this work would depend on the overall volume and type of traffic typically traversing the roadway (truck haul route, summer cottage traffic route, etc.). Typically, this work would be carried out on an annual or bi-annual basis.

6.7 Bridge deck drainage

This would include maintaining existing deck drains free of debris and maintaining them in an unplugged condition. This operation would typically be carried out on an annual basis, after winter clearing operations have ceased.

6.8 Clearing of debris / vegetation from approach guiderail

This would involve removing debris and vegetation from in front of approach guiderail. Although this is mainly a safety measure (to ensure proper performance of the guiderail), it also assists in prolonging the lifespan of the guiderail (accumulation of debris can accelerate rot on wooden posts, corrosion on steel guiderail, etc.).

6.9 Surface sealing of exposed concrete surfaces

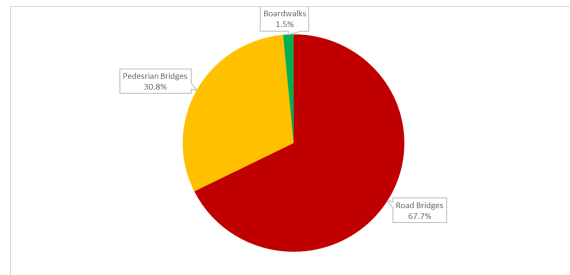
This would include cleaning and applying a concrete sealer on concrete surfaces exposed within the splash zone (exposed concrete decks, curbs, sidewalks and barrier walls); this operation is not typically required on an annual basis and would typically be completed in 3 to 5-year intervals. Sealing concrete surfaces periodically assists in minimizing the migration of chlorides into the concrete.

7.0 Structure Inventory Overview

TSI Inc. completed the OSIM inspection for twenty-four (24) Municipal Structures identified by the Town of Gananoque in 2024. The structures are split between three (3) road bridges, ten (10) pedestrian bridges and eleven (11) pedestrian boardwalks. In addition, based on MTO OSIM manual (Section 1.1.3.1, P. 1-2), the inspection interval of culverts with spans ranging from 3 to 6m can be increased to four years if the culvert is in good condition and the engineer/owner believes that the culvert or condition will not change significantly before the next inspection.

Structure replacement costs were calculated according to the guidelines in Section 5 of this report. The replacement cost of the bridges and boardwalks is included in **Appendix A**. The total replacement cost is approximately **\$14,900,000.0** broken down as follows for the **24** structures inspected:

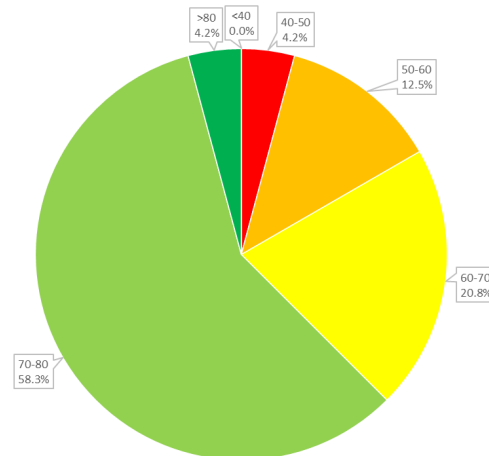
Replacement Costs		
Structure	Cost	Percentage
Road Bridges	\$10,100,000.0	67.7%
Pedestrian Bridges	\$4,600,000.0	30.8%
Boardwalks	\$225,000.0	1.5%
Total	<u>\$14,925,000.0</u>	100.0



To determine the overall condition of the structures in the transportation system, the number of structures in each Bridge Condition Index (BCI) Range was determined. This measure is more preferable than computing the average BCI value of all structures, which can be highly affected by the very new or very poor structure ratings. Based on the OSIM inspections, the following table provides a breakdown of the BCI values in each range for **Structures**:

BCI Range	Number	Percentage
<40	0	0.0%
40-50	1	4.2%
50-60	3	12.5%
60-70	5	20.8%
70-80	14	58.3%
>80	1	4.2%
Total	24	100.0%

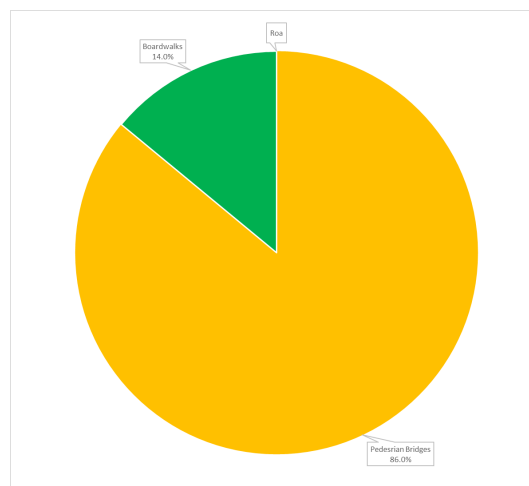
BCI range of structures.



The results clearly highlight the importance of proper planning and immediate action to be taken by the Counties in addressing the identified needs of the structures and to prolong the service life of its bridges and culverts.

The total anticipated capital costs of structures inspected is approximately **\$1,100,000.0** broken down into a 10-year asset management plan (**Appendix C**). Direct rehabilitation/replacement costs totaled approximately **\$800,000.0**. The rehabilitation/replacement costs will then be supplemented by additional costs associated with implementing detour, traffic control, environmental study, engineering design, etc. to comprise the total capital work costs. These costs are tabulated separately in **Appendix B**, while maintenance needs are included in **Appendix E**. A detailed list of additional investigations is brought in **Appendix D**. OSIM reports for structures are included in **Appendix G**.

Anticipated Capital Costs		
Structure	Cost	Percentage
Road Bridges	\$0.0	0.0%
Pedestrian Bridges	\$920,000.0	86.0%
Boardwalks	\$150,000.0	14.0%
Total	<u>\$1,070,000.0</u>	100.0



8.0 General Recommendations

Based on the inspection information, we recommend the following courses of action:

1. Act on all recommendations noted in this report and in individual OSIM reports.
2. Implement all maintenance needs as outlined in **Appendix E**.
3. Conduct follow-up OSIM inspections in two (2) years' time, or on a more frequent intervals as recommended.
4. Establish an infrastructure plan identifying priorities and budgets to guide annual Municipality budgeting processes for the repair and maintenance of bridges and culverts.
5. Continue project development to have "construction ready" (ready for tender) projects to take advantage of funding opportunities.

9.0 Limitations

The structural reviews were carried out to address the intent of applicable provincial Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Province of Ontario. No visual review can eliminate the possibility of obtaining partially imprecise or incomplete information. It can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the limited information obtained and in the formulation of remedial measures. Like all professional persons/entities rendering advice, we do not act as absolute insurers of the condition of the structures, but we commit ourselves to care and competence in reviewing the information and reaching those conclusions based on the limited data and information available.

Our undertaking at TSI Inc., therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the engineering profession. It is intended that the outcome of the structural reviews is to assist in reducing the client's risk associated with structural impairment. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of the Town of Gananoque and may not be reproduced in whole or in part, without the prior written consent of TSI Inc., or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. TSI Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

10.0 Closure

We trust that this report with its comments and recommendations provides you with sufficient information to develop your municipal structure Capital Plan. However, should you have any questions, please do not hesitate to contact our office.

Respectfully submitted,

TSI Inc.

A handwritten signature in blue ink that reads "Parisa Rameshni". The signature is stylized with a large, looping initial 'P' and a horizontal line underlining the name.

Parisa Rameshni

Ramin Rameshni, Ph.D., P.Eng.

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Appendix A: *Structure Inventory*

Structure Inventory																
Structure ID	Structure Name	Structure Location	Latitude	Longitude	Year Built	Structure Type	Type	BCI	No. of Spans	Length (m)	Width (m)	Road Width (m)	Replacement Cost (Structure only)	Current Structure Value	Identified Capital Work Needs	Anticipated Capital Cost
947	Water Street Swing Bridge	Water St (1 lane), sidewalk - south side only	44.325479	-76.159398	1894	Plate Girder - Half Through	Road Bridge	71.7	2	36.80	4.00		\$1,550,000.0	\$1,111,350.0	None	\$0.0
948	King Street Bridge	King St E (2 lanes), sidewalk - both sides	44.327033	-76.164556	1930	Slab on Steel Girder	Road Bridge	70.0	3	51.10	13.20	9.20	\$6,400,000.0	\$4,480,000.0	None	\$0.0
2221	Hudson Bridge	Machar St (1 lane), sidewalk - south side only	44.330728	-76.167581	2019	Acrow Panel Truss	Road Bridge	96.3	1	39.10	5.20	3.80	\$2,150,000.0	\$2,070,450.0	None	\$0.0
951	Gananoque River Pedestrian Bridge (Rail to Trail)	Lion's Trail (old Thousand Islands Railroad)	44.328486	-76.166889	1920	Timber Beam	Pedestrian Bridge	56.4	3	31.60	1.80		\$600,000.0	\$338,400.0	Major Rehabilitation	\$360,000.0
953	Black (Snappers) Bridge	Lion's Trail (old Thousand Islands Railroad)	44.338872	-76.174972	1924	Pony Truss	Pedestrian Bridge	58.8	1	36.00	6.20	1.30	\$1,880,000.0	\$1,105,440.0	Major Rehabilitation	\$530,000.0
950	Confederation Basin Pedestrian Bridge	unnamed pathway over Dam (55 m North of Tanner Street)	44.327860	-76.166260	1979	Slab on Steel Girder	Pedestrian Bridge	79.8	4	41.80	3.85		\$1,600,000.0	\$1,276,800.0	None	\$0.0
13692	Power Canal Pedestrian Bridge	unnamed pathway over Dam (30 m South of Park Street)	44.328115	-76.165825	2015	Slab on Steel Girder	Pedestrian Bridge	62.2	1	9.00	2.10		\$250,000.0	\$155,500.0	None	\$0.0
13693	Riverside Loop Pedestrian Bridge	Riverside Loop Trail	44.337680	-76.175190	2004	Boardwalk	Pedestrian Bridge	72.7	1	5.80	1.22	0.80	\$35,000.0	\$25,445.0	None	\$0.0
14107	Narrows Loop South Pedestrian Bridge	Narrows Loop Trail	44.341475	-76.175270		Boardwalk	Pedestrian Bridge	71.6	1	3.55	1.20	0.90	\$20,000.0	\$14,320.0	None	\$0.0
14108	Stocking Hill Creek Pedestrian Bridge	Roger's Trail	44.340655	-76.164418		Boardwalk	Pedestrian Bridge	70.7	1	18.40	1.25		\$70,000.0	\$49,490.0	Minor Rehabilitation	\$17,500.0
14109	Grasshopper Park Pedestrian Bridge	River Trail	44.330666	-76.153366		Boardwalk	Pedestrian Bridge	71.1	1	6.20	1.20		\$35,000.0	\$24,885.0	None	\$0.0
14110	Arthur Street Pedestrian Bridge	River Trail	44.333300	-76.147055		Boardwalk	Pedestrian Bridge	72.0	10	26.80	1.50		\$60,000.0	\$43,200.0	None	\$0.0
14111	McLean Forest Pedestrian Bridge	River Trail	44.334070	-76.145620		Boardwalk	Pedestrian Bridge	68.0	2	6.60	1.55		\$50,000.0	\$34,000.0	Minor Rehabilitation	\$12,500.0
14112	Herbert I	Roger's Trail	44.339450	-76.160460		Boardwalk	Pedestrian Boardwalk	43.8	1	3.60	0.90		\$15,000.0	\$6,570.0	Replacement	\$18,750.0
14113	Herbert II	Roger's Trail	44.339530	-76.160280		Boardwalk	Pedestrian Boardwalk	75.0	1	2.45	0.80		\$20,000.0	\$15,000.0	None	\$0.0
14114	Herbert III	Roger's Trail	44.339710	-76.160150		Boardwalk	Pedestrian Boardwalk	75.0	1	3.80	0.80		\$15,000.0	\$11,250.0	None	\$0.0
14115	Herbert IV	Roger's Trail	44.341140	-76.158800		Boardwalk	Pedestrian Boardwalk	75.0	1	3.10	0.80		\$10,000.0	\$7,500.0	None	\$0.0
14116	Narrows Loop I (North)	Narrows Loop Trail	44.342910	-76.175850		Boardwalk	Pedestrian Boardwalk	75.0	1	3.40	1.20		\$20,000.0	\$15,000.0	None	\$0.0
14117	Riverside Loop I	Riverside Loop Trail	44.337690	-76.174760		Boardwalk	Pedestrian Boardwalk	75.0	1	5.20	1.20		\$25,000.0	\$18,750.0	None	\$0.0
14118	Riverside Loop II	Riverside Loop Trail	44.337487	-76.174359		Boardwalk	Pedestrian Boardwalk	56.1	1	7.44	1.20		\$30,000.0	\$16,830.0	Replacement	\$37,500.0
14119	Riverside Loop III	Riverside Loop Trail	44.336902	-76.173399		Boardwalk	Pedestrian Boardwalk	69.4	1	5.19	1.20		\$25,000.0	\$17,350.0	Replacement	\$31,250.0
14120	Riverside Loop IV	Riverside Loop Trail	44.336117	-76.172498		Boardwalk	Pedestrian Boardwalk	66.2	1	8.47	1.20		\$35,000.0	\$23,170.0	Replacement	\$43,750.0
14121	Snappers Loop I	Snappers Loop Trail	44.340320	-76.175130		Boardwalk	Pedestrian Boardwalk	64.1	1	1.85	0.70		\$15,000.0	\$9,615.0	Replacement	\$18,750.0
14122	Wilson 1		44.339760	-76.151580		Boardwalk	Pedestrian Boardwalk	75.0	1	2.45	0.60		\$15,000.0	\$11,250.0	None	\$0.0
Total:													\$14,925,000.0	\$10,881,565.0		\$1,070,000.0

Appendix B: *Anticipated Capital Costs*

Anticipated Capital Costs										
Structure ID	Structure Name	BCI	Rehabilitation/Replacement Cost	Approach Repair/Rehabilitation Costs	Detour Construction Cost	Traffic Control	Engineering Investigations	Design	Contract Administration	Total
14112	Herbert I	43.8	\$15,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,500.0	\$2,250.0	\$18,750.0
14118	Riverside Loop II	56.1	\$30,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3,000.0	\$4,500.0	\$37,500.0
951	Gananoque River Pedestrian Bridge (Rail to Trail)	56.4	\$240,000.0	\$0.0	\$0.0	\$40,000.0	\$20,000.0	\$24,000.0	\$36,000.0	\$360,000.0
953	Black (Snappers) Bridge	58.8	\$376,000.0	\$0.0	\$0.0	\$40,000.0	\$20,000.0	\$37,600.0	\$56,400.0	\$530,000.0
14121	Snappers Loop I	64.1	\$15,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,500.0	\$2,250.0	\$18,750.0
14120	Riverside Loop IV	66.2	\$35,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3,500.0	\$5,250.0	\$43,750.0
14119	Riverside Loop III	69.1	\$25,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2,500.0	\$3,750.0	\$31,250.0
14111	McLean Forest Pedestrian Bridge	68.0	\$10,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,000.0	\$1,500.0	\$12,500.0
14108	Stocking Hill Creek Pedestrian Bridge	70.7	\$14,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,400.0	\$2,100.0	\$17,500.0
	Total:		\$760,000.0					Total: \$1,070,000.0		

Appendix C: Capital Work 10-Year Plan

Capital Work 10-Year Plan (in \$1000's)																	
Structure ID	Structure Name	BCI	Repair Needs	Recommended Timing		Description	2025 (\$000)	2026 (\$000)	2027 (\$000)	2028 (\$000)	2029 (\$000)	2030 (\$000)	2031 (\$000)	2032 (\$000)	2033 (\$000)	2034 (\$000)	10-Year Plan (\$000)
				1 to 5 Years	6 to 10 Years												
14112	Herbert I	43.8	Replacement	✓		Design Construction & CA	\$1.500	\$17.250	\$3.000								\$18.750
14118	Riverside Loop II	56.1	Replacement	✓		Design Construction & CA				\$34.500							\$37.500
951	Gananoque River Pedestrian Bridge (Rail to Trail)	56.4	Major Rehabilitation	✓		Design Construction & CA	\$44.000	\$316.000									\$360.000
953	Black (Snappers) Bridge	58.8	Major Rehabilitation		✓	Design Construction & CA			\$57.600	\$472.400							\$530.000
14121	Snappers Loop I	64.1	Replacement		✓	Design Construction & CA					\$1.500	\$17.250					\$18.750
14120	Riverside Loop IV	66.2	Replacement		✓	Design Construction & CA					\$3.500	\$40.250					\$43.750
14119	Riverside Loop III	69.4	Replacement		✓	Design Construction & CA					\$2.500	\$28.750					\$31.250
14111	McLean Forest Pedestrian Bridge	68.0	Minor Rehabilitation		✓	Design Construction & CA					\$1.000	\$11.500					\$12.500
14108	Stocking Hill Creek Pedestrian Bridge	70.7	Minor Rehabilitation		✓	Design Construction & CA					\$1.400	\$16.100					\$17.500
Total:							\$45.500	\$333.250	\$60.600	\$506.900	\$9.900	\$113.850	\$0.000	\$0.000	\$0.000	\$0.000	\$1,070.000

Appendix D: *Additional Investigations*

Additional Investigations										
Structure ID	Structure Name	Type	BCI	Length (m)	Width (m)	Road Width (m)	Additional Investigations	Priority		
								Urgent	1 Year	2 Year
951	Gananoque River Pedestrian Bridge (Rail to Trail)	Timber Beam	56.4	31.6	1.8	0.0	Underwater Investigation		\$20,000.0	
953	Black (Snappers) Bridge	Pony Truss	58.8	36.0	6.2	1.3	Underwater Investigation		\$20,000.0	
13692	Power Canal Pedestrian Bridge	Slab on Steel Girder	62.2	9.0	2.1	0.0	Underwater Investigation		\$20,000.0	
Total Cost:								\$0.0	\$60,000.0	\$0.0

Appendix E: *Maintenance Needs*

Maintenance Needs										
Structure ID	Structure Name	Structure Type	BCI	Length (m)	Width (m)	Road Width (m)	Maintenance Needs	Priority		
								Ongoing	1 Year	2 Year
14108	Stocking Hill Creek Pedestrian Bridge	Boardwalk	70.7	18.4	1.3	0.0	To remove beaver dam and Debris.		\$3,000.0	
14109	Grasshopper Park Pedestrian Bridge	Boardwalk	71.1	6.2	1.2	0.0	To remove heavy vegetation.		\$2,000.0	
14122	Wilson 1	Boardwalk	75.0	2.5	0.6	0.0	To remove fallen trees.		\$1,500.0	
Total Costs:								\$0.0	\$6,500.0	\$0.0

Appendix F: Approach Rehabilitation Structures

Appendix G: *OSIM Reports*

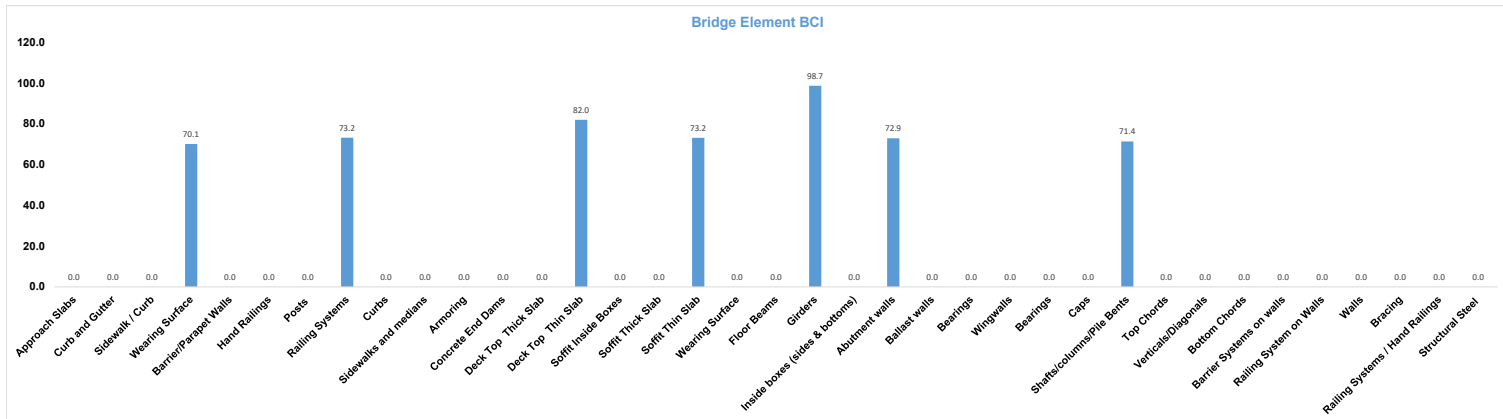
Structure Condition Summary Form	
Structure Name:	Confederation Basin Pedestrian Bridge
Structure Number:	950
Date of Inspection:	November 13, 2024
Assignment #:	24079
Consultant:	TSI Inc.

Bridge Condition Index (BCI):	<u>79.8</u>	
I_t	_____	Importance Factor for Traffic
I_c	_____	Importance Factor for Economic Impact
I_w	_____	Importance Factor for Bridge Width
I_p	_____	Importance Factor for Bridge Profile or Alignment
Bridge Sufficiency Index:	<u>79.8</u>	

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
					(1.00)	(0.75)	(0.40)	(0.00)	(TRV)				
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	29.20		25.70	3.00	0.50	175.2	122.9	70.1		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	200.0	83.60		79.40	4.20		16720.0	12246.0	73.2		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	152.57	49.94	97.63	5.00		18308.4	15019.5	82.0		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	152.57		144.57	8.00		18308.4	13395.3	73.2		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	200.0	166.08	157.58	8.50			33216.0	32791.0	98.7		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0	25.20		23.70	1.50		22680.0	16537.5	72.9		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0	37.80		34.10	3.50	0.20	34020.0	24277.5	71.4		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	143428.0	114389.7	79.8
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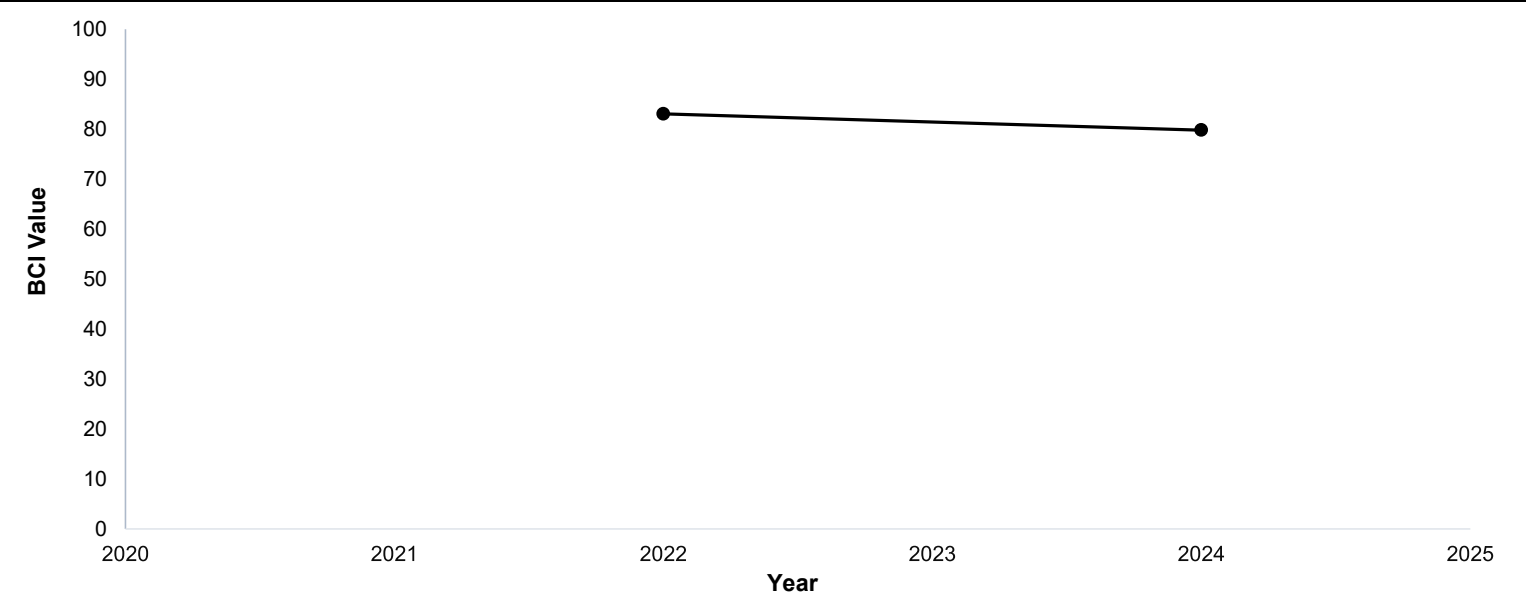
Structure Name:		Confederation Basin Pedestrian Bridge										
Main Hwy/Road #:	unnamed pathway over Dam		Services on structure:	Navig. Water		Non-Navig. Water		Ped.		☒		
	On structure	☒		Rail		Road		Other				
	Under structure											
			Services under structure:	Navig. Water		Non-Navig. Water		Ped.		☒		
				Rail		Road		Other				
Structure Location:		55 m North of Tanner Street										
Latitude:		44.32786		Longitude:		-76.16626						
Owner/Custodian:	Town of Gananoque			Heritage	Not Cons.		Cons./not App.		List/not Desig.			
				Designation:	Desig./not List		Desig. & List					
MTO Region:	Eastern Region			Hwy Class:	Freeway		Arterial					
					Collector		Local					
MTO District:	Kingston			Posted Speed:			No. of Lanes:					
Old County:	Leeds and Grenville			AADT:			% Trucks:					
Township:	Leeds			Inspection Route Sequence:								
Structure Type:	Slab on Steel Girder			Interchange Number:								
Total Deck Length:	41.80		m	Interchange Structure Number:								
Overall Str. Width:	3.65		m	Min. Vertical Clearance:								
Total Deck Area:	152.57		sq. m	Special Routes:	Transit		Truck					
Culvert Length:			m		School		Bicycle					
Roadway Width:			m	Detour Length Around Bridge:				km				
Skew Angle:			Degrees	Traffic Directional Bound:		North/South						
No. of Spans:	4.0			Fill on Structure:				m				
Span Lengths:	3.7. 6.5. 3.4. 3.7										m	

Year Built:	1979	Year of Last Major Rehabilitation:	2016
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

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		2024	79.8		
Regular OSIM		2022	83.07		



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

Field Inspection Information:					
Date of Inspection:	November 13, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Sunny				
Temperature:	4 °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 of Crack Widths:	X			
Investigation Notes: Bridge is on dam structure. Dam safety review is recommended.					
Overall Structure Notes:					
Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace	
Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years		
Overall Comments:	Structure is generally in good condition. Evidence of wide crack with efflorescence was noted on dam sluits. Dam safety review is recommended.				
Date of Next Inspection:	2026				

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:	Decks	Length:	41.80					
Element Name:	Deck Top– Thin Slab	Width:	3.65					
Location:	Top of Structure	Height:	0.08					
Material:	Cast-in-Place Concrete	Count (items):	1					
Element Type:	Exposed Wearing Surface	Total Quantity:	152.57 m ²					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2	49.94	97.63	5.00		00		
Comments:	Evidence of minor cracks was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Barriers	Length:	41.80					
Element Name:	Railing Systems	Width:						
Location:	East & West of Structure	Height:	3.65					
Material:	Steel	Count (items):	2					
Element Type:		Total Quantity:	83.60 m					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m		79.40	4.20		00		
Comments:	- Minor coating loss on top rail. - Railing mid-span is slightly unstable, likely due to lack of a corner post.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Abutments	Length:							
Element Name:	Abutment walls	Width:	3.60						
Location:	North and South	Height:	3.50						
Material:	Cast-in-Place Concrete	Count (items):	2						
Element Type:		Total Quantity:	25.20 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		23.70	1.50		00			
Comments:	• Evidence of minor crack and efflorescence 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 the structure	Height:							
Material:	Native	Count (items):							
Element Type:		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:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Decks	Length:	41.80				
Element Name:	Soffit– Thin Slab	Width:	3.65				
Location:	Below the deck	Height:					
Material:	Steel	Count (items):	1				
Element Type:		Total Quantity:	152.57 m ²				
Environment:	Moderate	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m2		144.57	8.00		00	
Comments:	• Generally in good condition.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Beams/Main Longitudinal Element (MLE'S)	Length:	17.30				
Element Name:	Girders	Width:					
Location:	Below Deck	Height:	0.30				
Material:	Steel	Count (items):	16				
Element Type:		Total Quantity:	166.08 m ²				
Environment:	Moderate	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m2	157.58	8.50			00	
Comments:	• Generally in excellent condition.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Piers	Length:	3.60						
Element Name:	Shafts/Columns/Pile Bents	Width:							
Location:	Underside of deck	Height:	3.50						
Material:	Cast-in-Place Concrete	Count (items):	3						
Element Type:		Total Quantity:	37.80 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		34.10	3.50	0.20	00			
Comments:	- Evidence of crack and efflorescence was noted. - Bridge is on dam structure. Dam safety review is recommended. - Evidence of wide crack with efflorescence was noted on dam sluits.								
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	Height:							
Material:	Native	Count (items):	4						
Element Type:		Total Quantity:	4.00 Each						
Environment:		Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00			00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Approaches	Length:	4.00					
Element Name:	Wearing Surface	Width:	3.65					
Location:	North and South Approaches	Height:						
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:		Total Quantity:	29.20 m2					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		25.70	3.00	0.50			
Comments:	Evidence of crack was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Foundations	Length:						
Element Name:	Foundation (Below Ground Level)	Width:						
Location:	Below Abutments walls, Wingwalls and Piers	Height:						
Material:		Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:	☒					
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	N/A		All					
Comments:	- 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

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 1 : East Elevation



Figure 2 : West Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 3 : Bridge Looking North



Figure 4 : Bridge Looking South

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 5 : Stream Looking East (D/S)



Figure 6 : Stream Looking West (U/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 7 : Bridge Deck (Typ.)



Figure 8 : West Railing

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 9 : East Railing



Figure 10 : SE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 11 : NE Embankment



Figure 12 : NW Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 13 : SW Embankment

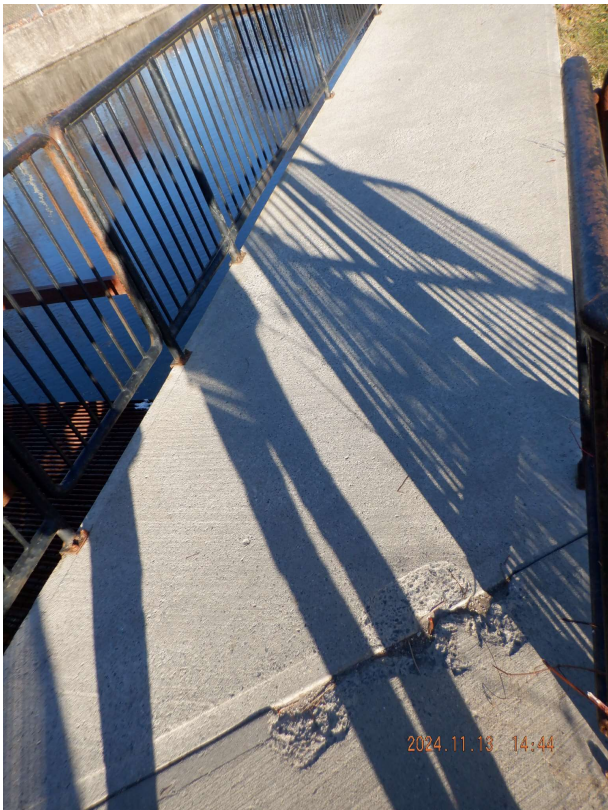


Figure 14 : North Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 15 : Deck Dam (Typ.)



Figure 16 : Streambed Condition (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Confederation Basin Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 55 m North of Tanner Street



Figure 17 : South Approach

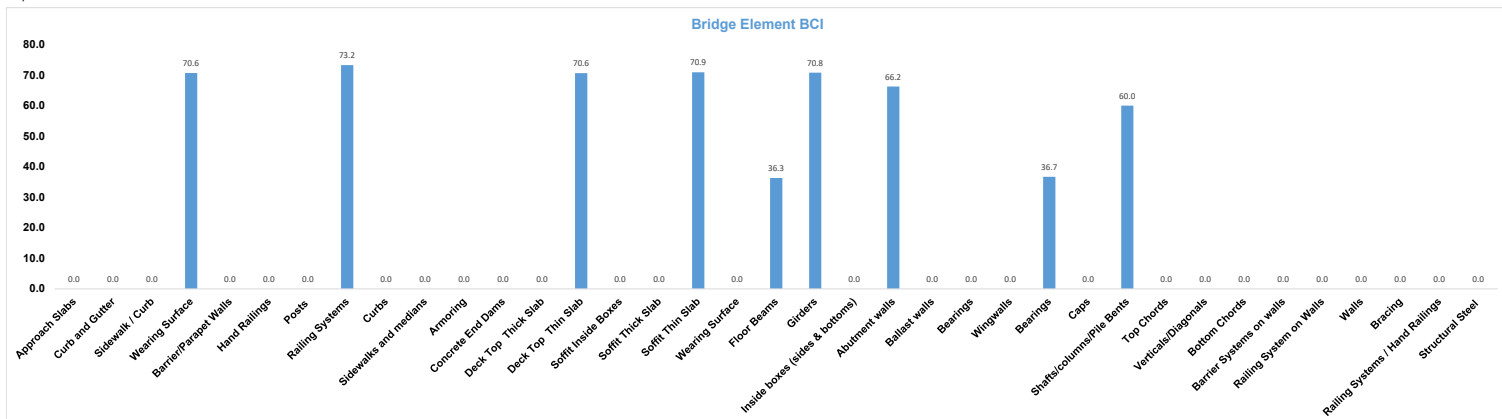


Figure 18 : Dam Sluits (Typ.)-Evidence of Wide Crack with Efflorescence

Structure Condition Summary Form		Bridge Condition Index (BCI): <u>56.4</u>	
Structure Name:	<u>Gananoque River Pedestrian Bridge (Rail to Trail)</u>	I_t	<u> </u> Importance Factor for Traffic
Structure Number:	<u>951</u>	I_c	<u> </u> Importance Factor for Economic Impact
Date of Inspection:	<u>November 13, 2024</u>	I_w	<u> </u> Importance Factor for Bridge Width
Assignment #:	<u>24079</u>	I_b	<u> </u> Importance Factor for Bridge Profile or Alignment
Consultant:	<u>TSI Inc.</u>	Bridge Sufficiency Index:	<u>56.4</u>

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.

Total:	188420.0	106197.8	56.4
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Inventory Data:

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)			
Main Hwy/Road #:	Lion's Trail (old Thousand Islands)		Services on structure:
	On structure	☒	
	Under structure		
			Navig. Water ☐ Non-Navig. Water ☐ Rail ☐ Road ☐
			Ped. ☒ Other ☐
Structure Location: 150 m East of River Street			
Latitude:	44.328486	Longitude:	-76.166889
Owner/Custodian:	Town of Gananoque	Heritage	Not Cons. ☐
		Designation:	Desig./not List ☐
		Cons./not App. ☐	List/not Desig. ☐
		Desig. & List ☐	
MTO Region:	Eastern Region	Hwy Class:	Freeway ☐
			Arterial ☐
			Collector ☐
MTO District:	Kingston	Posted Speed:	
Old County:	Leeds and Grenville	AADT:	
Township:	Leeds	Inspection Route Sequence:	
Structure Type:	Timber Beam	Interchange Number:	
Total Deck Length:	31.60 m	Interchange Structure Number:	
Overall Str. Width:	1.80 m	Min. Vertical Clearance:	
Total Deck Area:	56.88 sq. m	Special Routes:	Transit ☐
Culvert Length:			School ☐
Roadway Width:			Truck ☐
Skew Angle:			Bicycle ☐
No. of Spans:	3.0	Detour Length Around Bridge:	
Span Lengths:	10.1, 9.5, 10.1 m		

Historical Data:

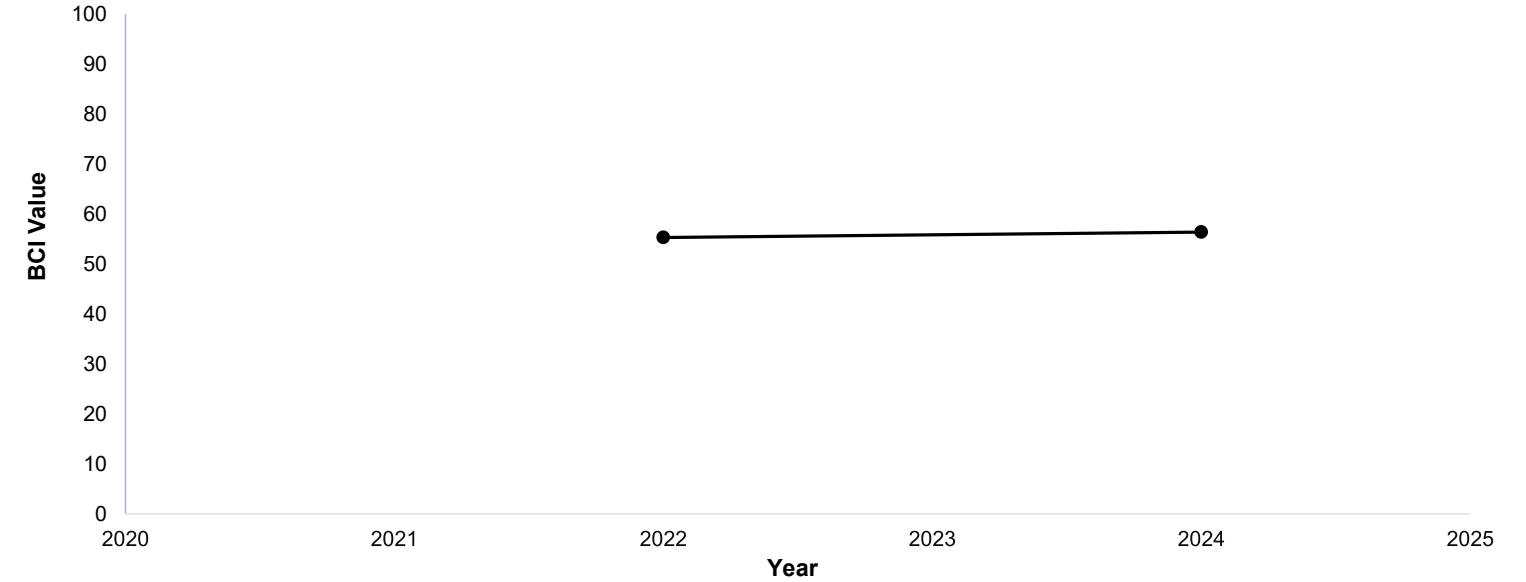
Year Built:	1920	Year of Last Major Rehabilitation:	2008
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

* Railing improvements were made 2011/2012.

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Regular OSIM		2024	56.4		
Regular OSIM		2022	55.32		



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

Field Inspection Information:					
Date of Inspection:	November 13, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Sunny				
Temperature:	4 °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 of Crack Widths:		X		
Investigation Notes: Limited access due to high water level.					
Overall Structure Notes:					
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☒ Major Rehab.	☐ Replace	
Timing of Recommended Work:	☐ 1 to 5 years	☐ 6 to 10 years			
Overall Comments:	Generally in fair condition. Evidence of weathering, rot, checks and splits in some deck boards, spalling, AAR and rust stain in abutment and pier, crack on pier foundation, corrosion on girder, crack, checks and decay on floor beam (ties) was noted.				
Date of Next Inspection:	2026				

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:	Decks	Length:	31.90						
Element Name:	Deck Top– Thin Slab	Width:	4.00						
Location:	Top of Structure	Height:	0.20						
Material:	Wood	Count (items):	1						
Element Type:	Exposed Wearing Surface	Total Quantity:	127.60 m ²						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		112.13	14.99	0.48	00			
Comments:	• Generally in good condition. • Evidence of weathering, checks and splits in some boards was noted. • Evidence of medium rot was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Barriers	Length:	31.60						
Element Name:	Railing Systems	Width:							
Location:	North & South of Structure	Height:	1.40						
Material:	Wood	Count (items):	2						
Element Type:		Total Quantity:	63.20 m						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m		60.00	3.20		00			
Comments:	• Evidence of weathering and rotted anchors was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Abutments	Length:						
Element Name:	Abutment walls	Width:	3.90					
Location:	East and West side of structure	Height:	2.00					
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:		Total Quantity:	15.60 m ²					
Environment:	Moderate	Limited Inspection:	☒					
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		11.85	3.60	0.15			
Comments:	- Evidence of light spalling, AAR and rust stain was noted. (from previous report) - Limited access due to high water level.						00	
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 the structure	Height:						
Material:	Native	Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	N/A		All					
Comments:							00	
Recommended Work:	Rehab	Replace	Maintenance Needs:			00		
	1-5 years	6-10 years	Urgent	1 year	2 years			

Element Group:	Decks	Length:	31.90						
Element Name:	Soffit– Thin Slab	Width:	4.00						
Location:	Below the deck	Height:							
Material:	Wood	Count (items):	1						
Element Type:		Total Quantity:	127.60 m ²						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		112.60	15.00		00			
Comments:	- Limited access to soffit. It is rated according to deck top. - Limited access due to high water level.								
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:	31.60						
Element Name:	Girders	Width:	0.25						
Location:	Below Deck	Height:	0.60						
Material:	Steel	Count (items):	6						
Element Type:		Total Quantity:	227.52 m ²						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		203.17	21.50	2.85	00			
Comments:	- Evidence of corrosion and perforation was noted. (from previous report) - Limited access due to high water level.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Piers	Length:	3.90					
Element Name:	Shafts/Columns/Pile Bents	Width:						
Location:	Underside of deck-Mid span	Height:	3.00					
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:	Concrete Shafts, Pier Walls	Total Quantity:	23.40 m ²					
Environment:	Moderate	Limited Inspection:	☒					
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		13.80	9.20	0.40	00		
Comments:	- Evidence of crack, AAR, rust stain and deterioration was noted. (from previous report) - Limited access due to high water level.							
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	Height:						
Material:	Native	Count (items):	4					
Element Type:		Total Quantity:	4.00 Each					
Environment:		Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	Each		4.00			00		
Comments:								
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:	4.00						
Location:	East and West Approaches	Height:							
Material:	Gravel	Count (items):	2						
Element Type:		Total Quantity:	16.00 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		14.00	2.00		00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Foundations	Length:							
Element Name:	Foundation (Below Ground Level)	Width:							
Location:	Below Abutments walls, Wingwalls and Piers	Height:							
Material:		Count (items):							
Element Type:		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:	• 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:	Piers	Length:						
Element Name:	Bearings	Width:						
Location:	On Piers	Height:						
Material:	Steel	Count (items):		12				
Element Type:	Plate	Total Quantity:		12.00		Each		
Environment:	Moderate	Limited Inspection:		☒				
Protection System:	None					Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	Each			11.00	1.00	00		
Comments:	- Evidence of corrosion was noted. (from previous report) - Limited access due to high water level.							
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:		31.60				
Element Name:	Floor Beams	Width:		4.00				
Location:	Below of deck	Height:		0.20				
Material:	Wood	Count (items):						
Element Type:	Deck ties	Total Quantity:		391.84		m2		
Environment:	Moderate	Limited Inspection:		☒				
Protection System:	None					Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		26.84	305.00	60.00	00		
Comments:	- Generally in fair condition. (from previous report) - Evidence of crack, checks and decay was noted. (from previous report) - Evidence of vegetation growth was noted. - Limited access due to high water level.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street



Figure 3 : Trail Looking East



Figure 4 : Trail Looking West

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street

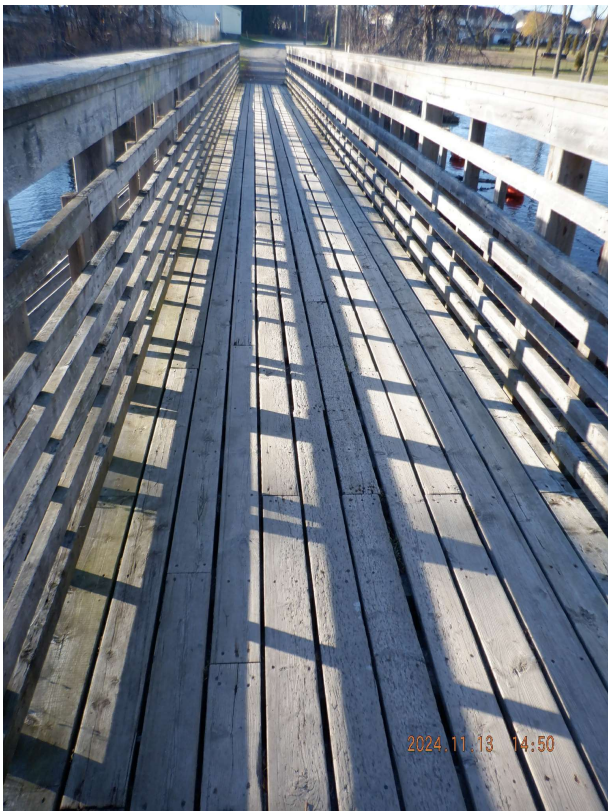


Figure 5 : Bridge Railing (Typ.)



Figure 6 : North Railing (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street



Figure 7 : South Railing (Typ.)



Figure 8 : Approach Railing (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street



Figure 9 : North Approach



Figure 10 : South Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street



Figure 11 : Pier Foundation (Typ.)



Figure 12 : Exterior Girder (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Gananoque River Pedestrian Bridge (Rail to Trail)

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 150 m East of River Street

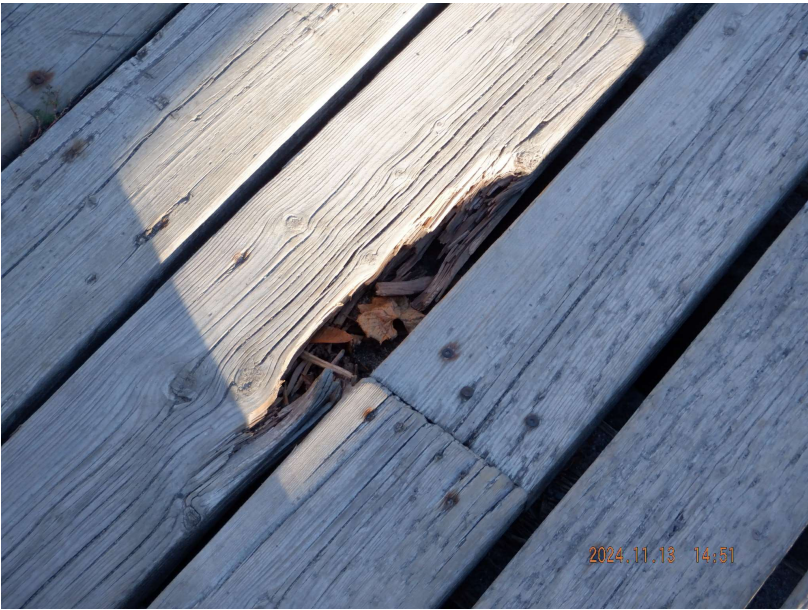


Figure 13 : Bridge Deck-Evidence of Medium Rot



Figure 14 : Overhead Utility-North

Structure Condition Summary Form	
Structure Name:	Black (Snappers) Bridge
Structure Number:	953
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

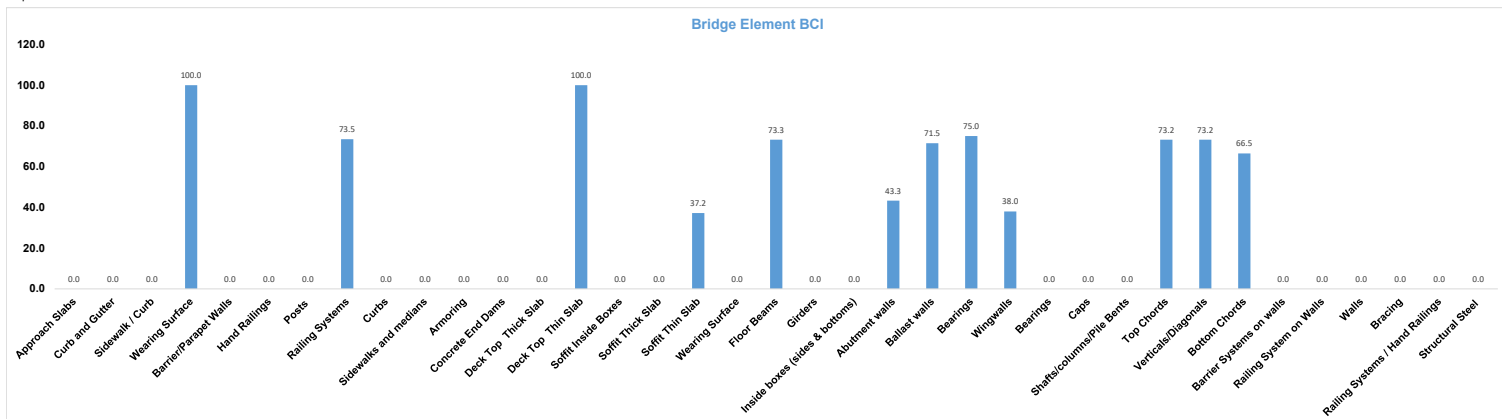
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index: 58.8

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
Approaches	Approach Slabs	Sq. m	140.0		(1.00)	(0.75)	(0.40)	(0.00)	(TRV)	0.0	0.0	0.0	
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	3.12	3.12				18.7	18.7	100.0		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	100.0	72.00		68.90	3.10		7200.0	5291.5	73.5		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	46.80	46.80				5616.0	5616.0	100.0		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	223.20			207.70	15.50	26784.0	9969.6	37.2		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0	110.84		105.34	5.50		22168.0	16241.0	73.3		
	Girders	Sq. m	200.0						0.0	0.0	0.0		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0	55.13		7.83	45.00	2.30	49612.5	21481.9	43.3		
	Ballast walls	Sq. m	350.0	15.44		13.92	1.50	0.02	5402.3	3862.7	71.5		
	Bearings	Ea.	1,000.0	4.00		4.00			4000.0	3000.0	75.0		
	Wingwalls	Sq. m	350.0	52.92			50.27	2.65	18522.0	7037.8	38.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0	84.68		80.38	4.30		25404.0	18601.5	73.2		
	Verticals/Diagonals	Sq. m	300.0	84.28		79.98	4.30		25284.0	18511.5	73.2		
	Bottom Chords	Sq. m	300.0	90.72		69.72	20.00	1.00	27216.0	18087.0	66.5		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	217227.5	127719.2	58.8
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Inventory Data:

Structure Name: Black (Snappers) Bridge			
Main Hwy/Road #:	Lion's Trail (old Thousand Islands)		
	On structure	☒	
	Under structure	☐	
Services on structure:		<i>Navig. Water</i> ☐ <i>Rail</i> ☐	<i>Non-Navig. Water</i> ☐ <i>Road</i> ☐
		<i>Ped.</i> ☒ <i>Other</i> ☐	
Services under structure:		<i>Navig. Water</i> ☒ <i>Rail</i> ☐	<i>Non-Navig. Water</i> ☐ <i>Road</i> ☐
		<i>Ped.</i> ☐ <i>Other</i> ☐	
Structure Location: 400 m North of Nalon Road			
Latitude:	44.338872	Longitude:	-76.174972
Owner/Custodian:	Town of Gananoque	Heritage Designation:	<i>Not Cons.</i> ☐ <i>Desig./not List</i> ☐
		<i>Cons./not App.</i> ☐ <i>Desig. & List</i> ☐	<i>List/not Desig.</i> ☐
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i> ☐ <i>Collector</i> ☐
		<i>Arterial</i> ☐ <i>Local</i> ☐	
MTO District:	Kingston	Posted Speed:	
Old County:	Leeds and Grenville	AADT:	
Township:	Leeds	% Trucks:	
Structure Type:	Pony Truss	Inspection Route Sequence:	
Total Deck Length:	36.00 m	Interchange Number:	
Overall Str. Width:	6.20 m	Interchange Structure Number:	
Total Deck Area:	223.20 sq. m	Min. Vertical Clearance:	m
Culvert Length:		Special Routes:	<i>Transit</i> ☐ <i>School</i> ☐
Roadway Width:	1.3 m	<i>Truck</i> ☐ <i>Bicycle</i> ☐	
Skew Angle:	Degrees	Detour Length Around Bridge:	km
No. of Spans:	1.0	Traffic Directional Bound:	North/South
Span Lengths:	36.00 m		
Fill on Structure: m			

Historical Data:

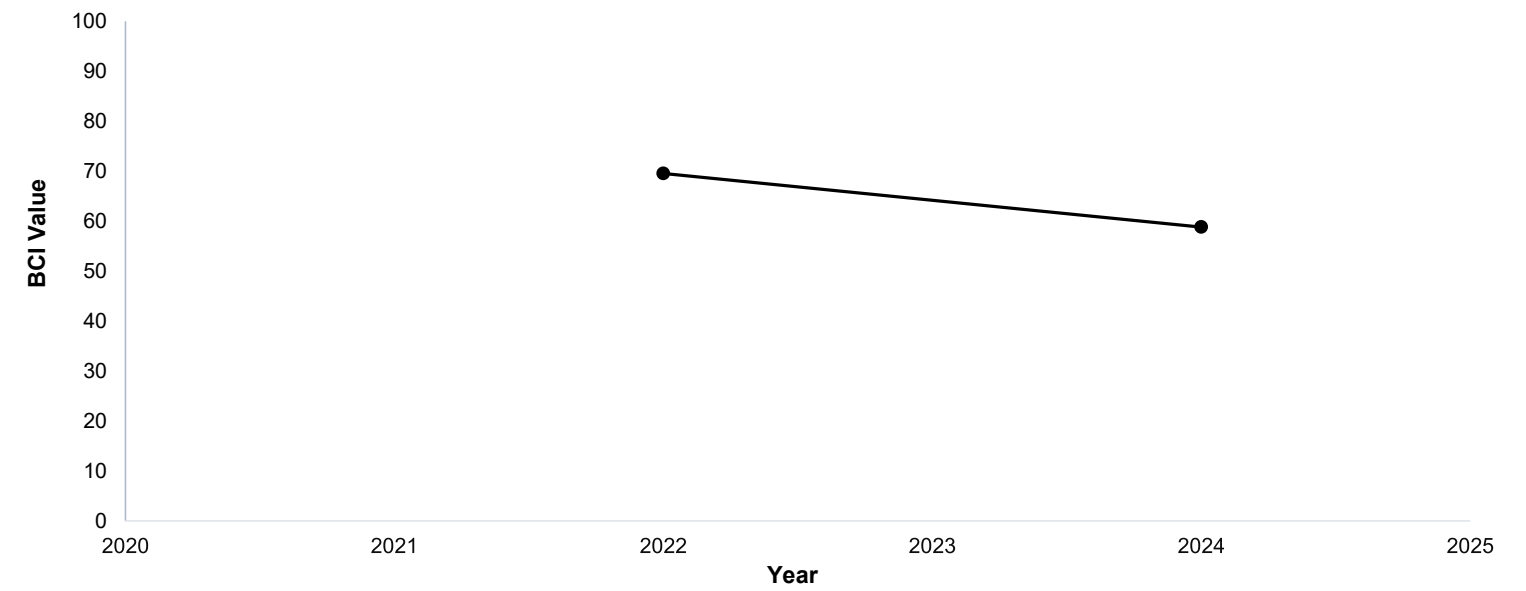
Year Built:	1924	Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	2022
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description): * Rehabilitation has been done in 2022. Deck top exposed surface is replaced.

** Previous history: A new combination pedestrian/bicycle barrier was built in 2006 as part of upgrading the Gananoque trail system. Approximately 35 railway ties were replaced and running boards installed at this time.

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Regular OSIM		2024	58.8		Rehabilitation has been done in 2022.
Regular OSIM		2022	69.54		This should be 60.5- Unknown calculation.



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

Field Inspection Information:					
Date of Inspection:	November 23, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Cloudy				
Temperature:	7° 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 of Crack Widths:	X			
Investigation Notes: Rehabilitation has been done in 2022 (new deck top exposed surface). Limited access due to high water level.					
Overall Structure Notes:					
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☒ Major Rehab.	☐ Replace	
Timing of Recommended Work:	☐ 1 to 5 years	☒ 6 to 10 years			
Overall Comments:	Generally structure is in good to fair condition. Evidence of disintegration, crack, efflorescence, AAR, graffiti & rust stain in abutment and wingwall, severe disintegration and exposed rusted rebar on SE corner of abutment, decay, weathering, checks and shakes on soffit, corrosion on floor beam was noted. Minor rehab is recommended for concrete repair and soffit repair.				
Date of Next Inspection:	2026				

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:	Decks	Length:	36.00						
Element Name:	Deck Top– Thin Slab	Width:	1.30						
Location:	Top of Structure	Height:							
Material:	Wood	Count (items):	1						
Element Type:	Exposed Wearing Surface	Total Quantity:	46.80 m ²						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2	46.80				00			
Comments:	• Generally in excellent condition. • Rehabilitation has been done in 2022.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Barriers	Length:	36.00						
Element Name:	Railing Systems	Width:							
Location:	East & West of Structure	Height:	1.40						
Material:	Wood	Count (items):	2						
Element Type:	Wood Rail <83mm Thick on Wood Post	Total Quantity:	72.00 m						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m		68.90	3.10		00			
Comments:	• Evidence of weathering was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Abutments	Length:						
Element Name:	Abutment walls	Width:	7.35					
Location:	North and South side of structure	Height:	3.75					
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:		Total Quantity:	55.13 m ²					
Environment:	Moderate	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		7.83	45.00	2.30			
Comments:	- Evidence of disintegration, crack, efflorescence, AAR, graffiti & rust stain was noted. - Evidence of severe disintegration and exposed rusted rebar on SE corner 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 the structure	Height:						
Material:	Native	Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	N/A		All					
Comments:								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Decks	Length:	36.00						
Element Name:	Soffit– Thin Slab	Width:	6.20						
Location:	Below the deck	Height:							
Material:	Wood	Count (items):	1						
Element Type:		Total Quantity:	223.20 m ²						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2			207.70	15.50	00			
Comments:	- Evidence of decay, weathering, checks and shakes was noted. (from previous report) - Limited access due to high water level.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Abutments	Length:	4.20						
Element Name:	Wingwalls	Width:							
Location:	NE, NW, SE, SW	Height:	3.15						
Material:	Cast-in-Place Concrete	Count (items):	4						
Element Type:		Total Quantity:	52.92 m ²						
Environment:	Benign	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2			50.27	2.65	00			
Comments:	Evidence of disintegration, efflorescence, AAR and crack was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Abutments	Length:							
Element Name:	Bearings	Width:							
Location:	North and South	Height:							
Material:	Steel	Count (items):		4					
Element Type:	Plate	Total Quantity:		4.00 Each					
Environment:		Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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	Height:							
Material:	Native	Count (items):		4					
Element Type:		Total Quantity:		4.00 Each					
Environment:		Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:			00	
		1-5 years		6-10 years		Urgent		1 year	2 years

Element Group:	Approaches	Length:	1.20					
Element Name:	Wearing Surface	Width:	1.30					
Location:	North & South Approaches	Height:						
Material:	Wood	Count (items):	2					
Element Type:		Total Quantity:	3.12 m2					
Environment:	Moderate	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2	3.12				00		
Comments:								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Foundations	Length:						
Element Name:	Foundation (Below Ground Level)	Width:						
Location:	Below Abutments walls, Wingwalls and Piers	Height:						
Material:		Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:	☒					
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	N/A		All			00		
Comments:	- 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:	Beams/Main Longitudinal Element (MLE'S)	Length:	5.80						
Element Name:	Stringers	Width:	0.15						
Location:	Below of deck	Height:	0.51						
Material:	Steel	Count (items):	24						
Element Type:	I Type	Total Quantity:	24.00 Each						
Environment:	Benign	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		19.00	5.00		00			
Comments:	- Evidence of corrosion was noted. (from previous report) - Limited access due to high water level.								
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:	5.80						
Element Name:	Floor Beams	Width:	0.35						
Location:	Below of deck	Height:	0.84						
Material:	Steel	Count (items):	7						
Element Type:	I-Type	Total Quantity:	110.84 m2						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		105.34	5.50		00			
Comments:	- Generally in good condition. - Evidence of corrosion was noted. (from previous report) - Limited access due to high water level.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Abutments	Length:							
Element Name:	Ballast walls	Width:	7.35						
Location:	North & South	Height:	1.05						
Material:	Cast-in-Place Concrete	Count (items):	2						
Element Type:		Total Quantity:	15.44 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		13.92	1.50	0.02	00			
Comments:	Evidence of timber blocking, debris, AAR and cracks was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Trusses/Arches	Length:	36.00						
Element Name:	Bottom Chords	Width:	0.15						
Location:	East & West	Height:	0.48						
Material:	Steel	Count (items):	2						
Element Type:	I-Type	Total Quantity:	90.72 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		69.72	20.00	1.00	00			
Comments:	- Generally in good condition. - Evidence of corrosion was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Trusses/Arches	Length:	29.00						
Element Name:	Top Chords	Width:	0.25						
Location:	East & West	Height:	0.48						
Material:	Steel	Count (items):	2						
Element Type:	I Type	Total Quantity:	84.68 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		80.38	4.30		00			
Comments:	• Evidence of corrosion was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Trusses/Arches	Length:	4.30						
Element Name:	Verticals	Width:	0.24						
Location:	East & West	Height:	0.25						
Material:	Steel	Count (items):	20						
Element Type:	I-Type	Total Quantity:	84.28 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		79.98	4.30		00			
Comments:	• Generally in good condition. • Evidence of corrosion was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Accessories (Attachments and Signs)			Length:					
Element Name:	Signs			Width:					
Location:	NE, NW, SE, SW			Height:					
Material:	Steel			Count (items):		4			
Element Type:				Total Quantity:		4.00		Each	
Environment:	Severe			Limited Inspection:					
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00			00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:			00	
		1-5 years		6-10 years		Urgent		1 year	2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 1 : West Elevation



Figure 2 : Stream Looking East (D/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 3 : Stream Looking West (U/S)



Figure 4 : North Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 5 : South Approach



Figure 6 : Lookout Area (Typ.x4)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road

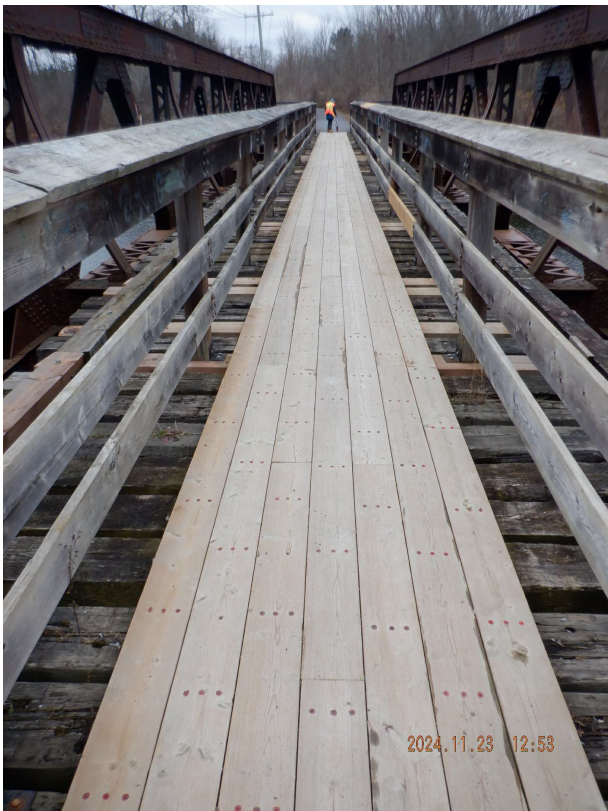


Figure 7 : Bridge Deck (Typ.)



Figure 8 : East Railing (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 9 : West Railing (Typ.)



Figure 10 : Original Bridge Truss (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 11 : Bridge Bearing Seat (Typ.)-Evidence of Severe Disintegration



Figure 12 : North Abutment (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Black (Snappers) Bridge

Hwy/Road Name: Lion's Trail (old Thousand Islands Railroad)

Location: 400 m North of Nalon Road



Figure 13 : SE Wingwall (Typ.)



Figure 14 : Overhead Utility-West

BIENNIAL OSIM BRIDGE INSPECTION & CAPITAL NEED ANALYSIS

SUMMARY REPORT



TSI PROJECT NO: 24079

September 2025

(Final)



GANANOQUE

Submitted To:

The Corporation of the Town of Gananoque
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Appendices

Appendix A: Structure Inventory

Appendix B: Anticipated Capital Costs

Appendix C: Capital Work 10-Year Plan

Appendix D: Additional Investigations

Appendix E: Maintenance Needs

Appendix F: Approach Rehabilitation Structures

Appendix G: OSIM Reports

1.0 Introduction

TSI Inc. was retained by the Corporation of the Town of Gananoque to perform detailed visual inspection of the Municipality's structural culverts and bridges in accordance with the MTO Ontario Structure Inspection Manual (OSIM-2018). The scope of work included carrying out biennial OSIM inspection for three (3) road bridges, ten (10) pedestrian bridges and eleven (11) pedestrian boardwalks in accordance with the requirements of the most recent edition (2018) of MTO OSIM manual. This summary report contains the individual OSIM inspection forms, as well as the Maintenance Needs Plan, and the 10-year (Rehabilitation/Replacement) Capital Plan for all structures inspected.

2.0 Scope of Work

The assignment involved the following:

- A detailed visual inspection of each structure under direct supervision of a Professional Engineer, licensed in the Province of Ontario, and trained by the Ministry of Transportation to do OSIM inspection;
- Generating OSIM inspection reports including representative pictures, observation notes, and comments from the field inspection for each structure;
- Completion of a prioritized list of maintenance needs for each structure and associated cost estimate (in current year dollars);
- Completion of a prioritized list of repairs and/or replacement needs for each structure, and its corresponding capital cost estimate, (in current year dollars);
- A detailed Summary Report presented herein.

3.0 Purpose

It is intended that the results of the assignment will be used by the Municipality to ensure that the following items are properly administrated:

- Ensure that the Municipality's structures remain at an acceptable level of safety;
- Ensure that the useful service life of the structures is prolonged;
- Ensure that maintenance and rehabilitation needs are identified and recorded for future planning;

- Ensure that the Municipality has adequate economic and technical information to effectively plan for additional studies and investigations, repair, and/ or replacement of the structure.

4.0 Structure Inspection

4.1 Methodology

The structures were visually inspected in accordance with the MTO Ontario Structure Inspection Manual (OSIM). To achieve the goals and objectives of this assignment, an element-by-element visual assessment of each structure was completed to identify material defects, performance deficiencies, and maintenance needs. The “severity and extent” approach, as outlined in the Preface of the OSIM, was used to simplify the process of using inspection information to estimate bridge rehabilitation needs and costs.

Prior to undertaking visual field inspections, previous OSIM reports were reviewed. A copy of the original drawings, where available, was requested from the Municipality and/or the Ministry of Transportation, Ontario and reviewed prior to the field inspections. The inspection work was completed by three (3) qualified inspectors including an experienced Professional Engineer, licensed in the Province of Ontario. Field inspections were conducted in November 2024 and April 2025. The work was carried out in accordance with the Occupational Health and Safety Act and the requirements of the Ontario Traffic Control Manual Book 7 – Temporary Conditions, where applicable.

Binoculars, camera, tape measures, steel chain, chest waders, flotation vest, hammers, paint markers and other items as listed in Clause 1.4 of Section 1 under Part 2 of OSIM were used to complete the inspections.

During an OSIM inspection, elements of a bridge or culvert are inspected for visual signs of deterioration. Additionally, tactile inspections of accessible concrete elements, such as concrete sounding, are undertaken during an inspection. The tactile inspection uncovers deterioration that is not visually noticeable. The inspection manual provides guidelines for the calculation of the overall quantity of an element. Element quantities are based on the element type and are in units for area (m²), linear distance (m), units (each), etc.

Upon completion of the field inspections the structures were reviewed with regards to their individual maintenance and rehabilitation needs. A thorough review of each structure was completed for prioritizing and making recommendations appropriate for current and future use

requirements. A 10-year Capital Plan has been prepared to outline all replacement and/or rehabilitation recommendations, associated costs, and corresponding recommended timelines for each structure.

All reports and evaluation works have been internally reviewed to ensure accuracy and completeness. Report forms have been completed as per section 7 under Part 2 of OSIM. Budget estimates for recommended work have been based on recent project costs for similar work as well as industry benchmark costs.

4.2 Bridge Condition Index (BCI)

The BCI is calculated using asset management principals based on the remaining economic worth of the bridge. It is based on the premise that a bridge starts at a new condition and deteriorates to a lower condition with time. It uses actual inspection data from the various bridge elements and as the elements deteriorate, they have a lower economic value. Essentially, the BCI is a weighted average of all elements (since all elements are not of equal value to the bridge) and all Condition States (since each condition state represents a certain degree of loss of value of the element). The BCI begins at 100 when the bridge is in new condition and theoretically becomes 0 as all elements become fully in Poor condition. Practically, it is impossible for the BCI to fall to 0 since the entire bridge does not become poor before rehabilitation work is performed.

The BCI is based on the current value and replacement value of all elements in a bridge. The current value of the element is determined based on the depreciated value of the portions of the element that are in each of the four Condition States (Excellent, Good, Fair, and Poor). The following table provides weight factor used for condition states:

Condition State	Weight Factor
Excellent	1
Good	0.75
Fair	0.5
Poor	0.0

The BCI is used to plan repair and maintenance and does not imply for safety of a structure.

5.0 Determination of Costs

Given the cursory information obtained during the visual inspections and without having access to detailed design information, it is unrealistic to develop detailed cost estimates for each structure. For these reasons, benchmark budget costs were developed for categories of repair, rehabilitation and replacement. Usually, benchmark costs do not necessarily provide accurate costs for individual repairs/replacement but have proven to provide adequate accuracy for global budgeting purposes when dealing with a large number of structures.

For the purpose of this study, benchmark costs for the rehabilitation and replacement of structures are based on maintaining the existing width, length and alignment of each structure. However, the costs to replace the existing structures with structures meeting current geometric standards are included for comparison. For this purpose, an overall roadway width of 10 meters was used for both bridges and culverts. More accurate costs for each structure would be provided upon further engineering study and preliminary design based on exact repair, rehabilitation and replacement needs (including change in geometry). The following benchmark costs have been established for this report following the requirements of the inspection forms.

5.1 Bridge and Culvert replacement costs

Budget costs for the replacement of bridges are usually based on the deck surface area of individual structures (m^2). Therefore, benchmark replacement costs for this study were determined using the following unit costs based on the spans of individual bridges. The proposed unit costs are in general conformance with the recommendations of MTO Structural Financial Manual and our recent experience in the field. These unit costs include approach roadway costs (which do not vary with bridge span). In addition, the varying widths of bridges were considered to provide more realistic unit costs and to avoid large discrepancies in the replacement cost between bridges of different lengths, but similar surface areas.

Total Bridge Replacement Unit Costs		
Bridge Length (m)	Width (m)	Unit Replacement Cost (\$/m ²)
3-10	<10m	\$13,500.00
	≥10 m	\$12,500.00
10-20	<10m	\$12,500.00
	≥10 m	\$11,500.00
20-30	<10m	\$11,500.00
	≥10 m	\$10,500.00
>30	<10m	\$10,500.00
	≥10 m	\$9,500.00

In the case of boardwalks, the Unit Replacement Cost (\$/m²) is between \$3,000-10,000.

In the case of culverts, the plan area (or deck surface area) used in the calculation was ('total span' + 1 m) x ('length of culvert'). The purpose of using the Total Bridge Replacement Unit Costs table for culverts is to normalize the replacement cost figures. Although culverts are generally less expensive to construct than bridges, it is generally accepted that the expected service life span of a culvert is typically less than a bridge. It is valid, therefore, on a life cycle cost basis, to utilize the total Bridge Replacement Unit Costs table for all structures, whether they are bridge or culvert type.

5.2 Bridge Repair / Rehabilitation Costs

For budgeting purposes, costs for the rehabilitation of bridges are typically expressed as a percentage of the total replacement costs. Rehabilitation costs for this study are separated into four categories as presented in the table below.

Bridge Rehabilitation Costs	
Category	% of Replacement Cost
Major Bridge Rehabilitation	40-60
Minor Bridge Rehabilitation	20-40
Major Item Repair	10-20
Minor Item Repair	5 or less

5.3 Culvert Repair / Rehabilitation Costs

It is generally not practical to undertake major rehabilitation work to culvert crossings where significant material/performance deficiencies (e.g. metal liner (barrel) perforation or severe erosion of concrete) exist. Culvert replacement is normally planned in these circumstances. Repair work identified generally included repairs to the inlet and outlet structures such as headwalls, cut-off walls, retaining walls, restoration of backfill, slope protection at the culvert ends and installation / upgrading of guiderail. In the case of concrete barrels, some repair work to the barrels may be included if the opening is large enough to permit construction.

5.4 Approach Roadway Repair / Rehabilitation Costs

For this study, approaches are considered to be 30m of roadway from the center of each individual culvert (60 m total per culvert) and 6m of roadway from the end of the deck for each individual bridge (12m total per bridge). Repair / rehabilitation costs for approach roadways have been separated into three categories as presented in the table below.

Separate costs for Approach Roadway Repair / Rehabilitation have been included for Bridge Rehabilitation. For structure replacement costs and repairs, the approach roadway repair / rehabilitation costs have been included in the recommended work costs if applicable.

Approach Roadway Repair/Rehabilitation Costs	
Category	Cost
Capital Projects (Partial / Complete Paving, Guiderail)	\$80,000.00
Minor Repairs / Maintenance (Crack Sealing, Surface Sealing, Guiderail Repairs)	\$30,000.00
Crack Sealing Only	\$15,000.00

5.5 Construction Detour Costs

Several alternatives exist to maintain the flow of traffic when a bridge or culvert undergoes major rehabilitation or replacement. These include construction of a detour structure adjacent to the existing structure, a detour route around (avoiding) the structure, and the staging of the construction to allow traffic on the structure during construction. The construction of a detour structure is the costliest option and is usually recommended only when the other options are not possible. The detour route is the least expensive option but is often not practical due to the length of the detour route and the inconvenience to residents near the structure. The most frequently recommended option is the staging of rehabilitation work to allow the passage of traffic.

Since most bridge projects would consist of rehabilitation and not replacement, the staging of work would be the most frequently used option to maintain traffic during construction. Therefore, the benchmark costs for detours are based on “staging” of the work as per the following. These costs are based on additional costs incurred from staging of the work during construction (extra effort, time). Traffic control costs would be separate from detour costs and are presented later in this section.

Detour During Construction Costs	
Category	Cost
Detour (Minor Rehabilitation / Major Rehabilitation of Bridges Less than 10m Long / Culvert Replacement)	\$40,000.00
Detour (Major Rehabilitation / Bridge Replacement)	\$70,000.00

5.6 Traffic Control Costs

In addition to performing the work in stages to accommodate traffic, the safety of traffic passing on the bridge or over the culvert during construction must also be ensured. The costs of traffic control during staged projects would be as follows:

Traffic Control Costs	
Category	Cost
Traffic Control – Minor Rehabilitation	\$40,000.00
Traffic Control Major Rehabilitation	\$80,000.00

5.7 Utilities / Right of Way Costs

Most bridge or culvert rehabilitation / replacement projects do not require substantial expenses for the installation or modification of existing utilities. Similarly, most of these projects do not require an increase in right of way (ROW). Therefore, specific benchmark budget costs for these items were not developed.

5.8 Environmental Study Cost

Since bridge or culvert replacements / rehabilitations typically do not involve a change in alignment or a reduction in clearances under the structure, these projects usually fall under the Municipal Class Environmental Assessment (MCEA)-Schedule A or A+ for Ontario Municipal Highways. The specific requirement of these two schedules of MCEA do not include detailed environmental and mitigation plans, but typically requires written application with, and permission from, the appropriate environmental agencies (Ontario Ministry of Natural Resources, Ontario

Ministry of the Environment, Local Conservation Authorities (Permit to Take Water), etc.). Therefore, the benchmark budget cost for environmental study would be as follows (based on the requirement of Schedule A or A+ Environmental Assessment):

Environmental study Costs	
Category	Cost
Bridge / Culvert Replacement, Minor and Major Rehabilitation	\$15,000.00

5.9 Engineering Investigation

Further engineering investigation is recommended for several of the bridges and culverts as indicated on individual OSIM inspection forms. Benchmark budget costs for these additional engineering investigation works are presented in the table below:

Engineering Investigation		
Category	Type of Structure	Cost
Detailed Inspection / Rehabilitation Study – Full Bridge	Truss	\$60,000.00
	Other Structures	\$50,000.00
	Traffic Barrier Only*	\$15,000.00
Detailed Deck Condition Survey	Exposed Deck	\$35,000.00
	Asphalt Paved Deck	\$50,000.00
	Concrete Culvert with Height of Fill Less than 500mm**	\$25,000.00
Structure Evaluation	Truss	\$25,000.00
	Other Structures	\$20,000.00
Underwater Investigation	All Bridges	\$20,000.00
Monitoring of Deformation	All Bridges	\$10,000.00

* Requirements for traffic barriers on bridges and culverts were determined using the Canadian Highway Bridge Design Code, MTO Standards and best engineering standard practice. The evaluation of existing traffic barriers was based on assumed values of AADT and good engineering practice. For structures with existing approach guiderail, a review of the required approach / leaving end length of guiderail and end treatments (as per the MTO's Roadside Safety Manual) was not carried out.

** Deck condition survey on concrete culvert includes cores with no corrosion potential survey. Deck condition surveys on concrete culverts with a height of fill greater than 500 mm are not practical.

The benchmark budget costs for a Structure Evaluation and Detailed Deck Condition Survey would be reduced to 50% of that shown in the table above when any one of these are performed simultaneously with a Detailed Inspection / Rehabilitation Study.

Other investigations such as fatigue and seismic investigations would be included with the Detailed Inspection and Structure Evaluation (respectively), if deemed necessary by the engineer. Detailed coating condition surveys are typically only required where a failure of coating systems have occurred other than normal deterioration. A DART (Deck Assessment by Radar Technology) survey is not a commonly used investigation method. Detailed deck condition surveys are the most commonly used method of deck inspection. Therefore, individual costs for the various types of investigation described above are not provided.

5.10 Engineering Design Cost

For the purpose of this report, the "engineering design" associated with each bridge is estimated at 10% of the estimated rehabilitation/replacement cost.

5.11 Contract Administration, Construction Field Inspection and other design Services during Construction

For the purpose of this study, the total cost associated with "Contract Administration, Construction Field Inspection and other Design Services during Construction" is estimated at 15% of the estimated rehabilitation/replacement cost.

5.12 Other Costs

Any other costs not specified in the above (site specific requirements) are deemed to be covered in the total benchmark costs. Therefore, no specific amount for other work is specified in this report.

5.13 Contingency Costs

The benchmark costs used for budgeting purposes are based only on information obtained from visual OSIM inspections; hence, contingency allowances are already built into the benchmark costs. Therefore, specific amounts for contingencies will not be included in this report.

5.14 Total Capital Work Estimate

The total capital work estimate cost will be the sum of all above-noted costs identified under sub-sections 5.1 to 5.13 (where applicable).

6.0 Routine Maintenance

As part of the Municipality's overall bridge management program, a program of routine maintenance should be implemented and upkept for all structures. Maintaining this program will assist in minimizing the potential for premature deterioration of structural elements; and, when combined with a program of bridge rehabilitation, will assist in maximizing the useful service life of the Municipality's structure inventory.

Overall routine maintenance needs will vary depending on the type of structure, location, traffic volumes, winter maintenance procedures (sanding vs. salting, etc.), size of the structure, vintage and previous maintenance / rehabilitation carried out on the structure in the past. The following presents a general summary of routine maintenance operations that are considered applicable for the structures present within the Municipality's inventory:

6.1 Periodic bridge cleaning

This would include power-washing of all components exposed to roadway traffic and areas where debris accumulation is prevalent. This would include asphalt wearing surfaces, expansion joint gaps, edges of roadway, bearing seats, truss bottom chords, etc. Typically, this operation would be carried out on an annual basis, most likely each spring after winter sanding / salting operations have ceased; however, in some cases (i.e. gravel approach roadways, etc.), an increase in the number of cleanings per year may be required.

6.2 Concrete spot repairs

This would generally include localized patching of small concrete spalls and delamination located in areas within the roadway splash zones (top of deck, curbs, expansion joint block-outs, etc.). Completing these repairs will assist in preventing accelerated deterioration of concrete in these areas by reducing the ingress of chlorides, etc. There is no specific timing for these types of repairs, and they are generally performed on an as-needed basis.

6.3 Steel spot repairs / spot coating

This would generally include localized touch-ups to steel coatings located in areas within the roadway splash zones (truss bottom chords, exterior floor beams / stringers, etc.) as well as localized spot repairs in areas of appreciable section loss / corrosion. There is no specific timing for these types of repairs, and they are generally performed on an as-needed basis.

6.4 Clearing of debris in waterway

This would include clearing of trapped debris in the vicinity of the structure (upstream / downstream). This operation would typically be carried out on an annual basis, after the spring run-off period.

6.5 Asphalt surface repairs / rout and seal

This would include cold patch asphalt repairs, routing and sealing of wide cracks in asphalt. This operation would typically be carried out on an annual basis, after winter clearing operations have ceased.

6.6 Regrading of Approach Roadways (Gravel Roadway Surfaces)

This would include placing and grading fresh granular material on roadway surfaces. The timing of this work would depend on the overall volume and type of traffic typically traversing the roadway (truck haul route, summer cottage traffic route, etc.). Typically, this work would be carried out on an annual or bi-annual basis.

6.7 Bridge deck drainage

This would include maintaining existing deck drains free of debris and maintaining them in an unplugged condition. This operation would typically be carried out on an annual basis, after winter clearing operations have ceased.

6.8 Clearing of debris / vegetation from approach guiderail

This would involve removing debris and vegetation from in front of approach guiderail. Although this is mainly a safety measure (to ensure proper performance of the guiderail), it also assists in prolonging the lifespan of the guiderail (accumulation of debris can accelerate rot on wooden posts, corrosion on steel guiderail, etc.).

6.9 Surface sealing of exposed concrete surfaces

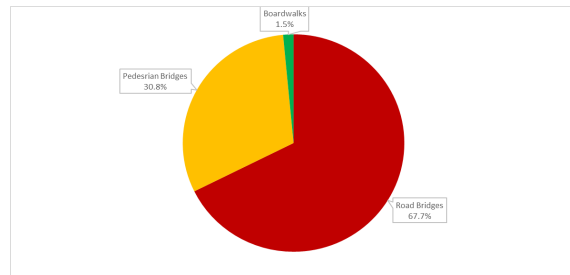
This would include cleaning and applying a concrete sealer on concrete surfaces exposed within the splash zone (exposed concrete decks, curbs, sidewalks and barrier walls); this operation is not typically required on an annual basis and would typically be completed in 3 to 5-year intervals. Sealing concrete surfaces periodically assists in minimizing the migration of chlorides into the concrete.

7.0 Structure Inventory Overview

TSI Inc. completed the OSIM inspection for twenty-four (24) Municipal Structures identified by the Town of Gananoque in 2024. The structures are split between three (3) road bridges, ten (10) pedestrian bridges and eleven (11) pedestrian boardwalks. In addition, based on MTO OSIM manual (Section 1.1.3.1, P. 1-2), the inspection interval of culverts with spans ranging from 3 to 6m can be increased to four years if the culvert is in good condition and the engineer/owner believes that the culvert or condition will not change significantly before the next inspection.

Structure replacement costs were calculated according to the guidelines in Section 5 of this report. The replacement cost of the bridges and boardwalks is included in **Appendix A**. The total replacement cost is approximately **\$14,900,000.0** broken down as follows for the **24** structures inspected:

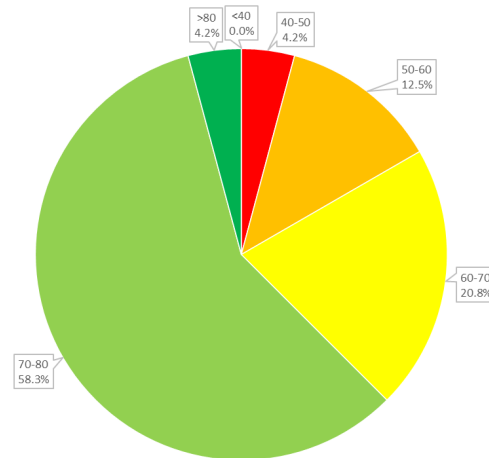
Replacement Costs		
Structure	Cost	Percentage
Road Bridges	\$10,100,000.0	67.7%
Pedestrian Bridges	\$4,600,000.0	30.8%
Boardwalks	\$225,000.0	1.5%
Total	<u>\$14,925,000.0</u>	100.0



To determine the overall condition of the structures in the transportation system, the number of structures in each Bridge Condition Index (BCI) Range was determined. This measure is more preferable than computing the average BCI value of all structures, which can be highly affected by the very new or very poor structure ratings. Based on the OSIM inspections, the following table provides a breakdown of the BCI values in each range for **Structures**:

BCI Range	Number	Percentage
<40	0	0.0%
40-50	1	4.2%
50-60	3	12.5%
60-70	5	20.8%
70-80	14	58.3%
>80	1	4.2%
Total	24	100.0%

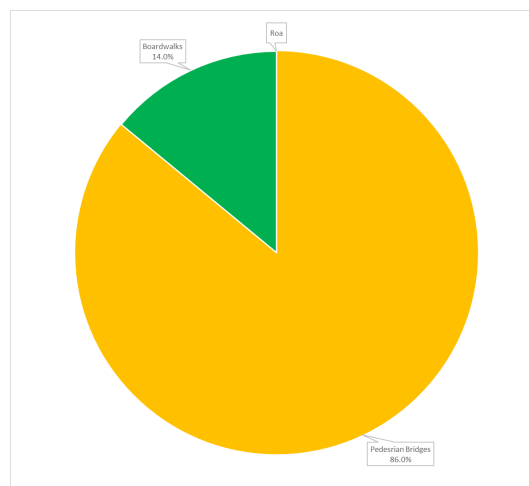
BCI range of structures.



The results clearly highlight the importance of proper planning and immediate action to be taken by the Counties in addressing the identified needs of the structures and to prolong the service life of its bridges and culverts.

The total anticipated capital costs of structures inspected is approximately **\$1,100,000.0** broken down into a 10-year asset management plan (**Appendix C**). Direct rehabilitation/replacement costs totaled approximately **\$800,000.0**. The rehabilitation/replacement costs will then be supplemented by additional costs associated with implementing detour, traffic control, environmental study, engineering design, etc. to comprise the total capital work costs. These costs are tabulated separately in **Appendix B**, while maintenance needs are included in **Appendix E**. A detailed list of additional investigations is brought in **Appendix D**. OSIM reports for structures are included in **Appendix G**.

Anticipated Capital Costs		
Structure	Cost	Percentage
Road Bridges	\$0.0	0.0%
Pedestrian Bridges	\$920,000.0	86.0%
Boardwalks	\$150,000.0	14.0%
Total	<u>\$1,070,000.0</u>	100.0



8.0 General Recommendations

Based on the inspection information, we recommend the following courses of action:

1. Act on all recommendations noted in this report and in individual OSIM reports.
2. Implement all maintenance needs as outlined in **Appendix E**.
3. Conduct follow-up OSIM inspections in two (2) years' time, or on a more frequent intervals as recommended.
4. Establish an infrastructure plan identifying priorities and budgets to guide annual Municipality budgeting processes for the repair and maintenance of bridges and culverts.
5. Continue project development to have "construction ready" (ready for tender) projects to take advantage of funding opportunities.

9.0 Limitations

The structural reviews were carried out to address the intent of applicable provincial Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Province of Ontario. No visual review can eliminate the possibility of obtaining partially imprecise or incomplete information. It can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the limited information obtained and in the formulation of remedial measures. Like all professional persons/entities rendering advice, we do not act as absolute insurers of the condition of the structures, but we commit ourselves to care and competence in reviewing the information and reaching those conclusions based on the limited data and information available.

Our undertaking at TSI Inc., therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the engineering profession. It is intended that the outcome of the structural reviews is to assist in reducing the client's risk associated with structural impairment. No other warranty or representation, either expressed or implied, is included or intended in this report.

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10.0 Closure

We trust that this report with its comments and recommendations provides you with sufficient information to develop your municipal structure Capital Plan. However, should you have any questions, please do not hesitate to contact our office.

Respectfully submitted,

TSI Inc.

A handwritten signature in blue ink that reads "Parisa Rameshni". The signature is stylized with a large, looping initial 'P' and a horizontal line underlining the name.

Parisa Rameshni

Ramin Rameshni, Ph.D., P.Eng.

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Appendix A: *Structure Inventory*

Structure Inventory																
Structure ID	Structure Name	Structure Location	Latitude	Longitude	Year Built	Structure Type	Type	BCI	No. of Spans	Length (m)	Width (m)	Road Width (m)	Replacement Cost (Structure only)	Current Structure Value	Identified Capital Work Needs	Anticipated Capital Cost
947	Water Street Swing Bridge	Water St (1 lane), sidewalk - south side only	44.325479	-76.159398	1894	Plate Girder - Half Through	Road Bridge	71.7	2	36.80	4.00		\$1,550,000.0	\$1,111,350.0	None	\$0.0
948	King Street Bridge	King St E (2 lanes), sidewalk - both sides	44.327033	-76.164556	1930	Slab on Steel Girder	Road Bridge	70.0	3	51.10	13.20	9.20	\$6,400,000.0	\$4,480,000.0	None	\$0.0
2221	Hudson Bridge	Machar St (1 lane), sidewalk - south side only	44.330728	-76.167581	2019	Acrow Panel Truss	Road Bridge	96.3	1	39.10	5.20	3.80	\$2,150,000.0	\$2,070,450.0	None	\$0.0
951	Gananoque River Pedestrian Bridge (Rail to Trail)	Lion's Trail (old Thousand Islands Railroad)	44.328486	-76.166889	1920	Timber Beam	Pedestrian Bridge	56.4	3	31.60	1.80		\$600,000.0	\$338,400.0	Major Rehabilitation	\$360,000.0
953	Black (Snappers) Bridge	Lion's Trail (old Thousand Islands Railroad)	44.338872	-76.174972	1924	Pony Truss	Pedestrian Bridge	58.8	1	36.00	6.20	1.30	\$1,880,000.0	\$1,105,440.0	Major Rehabilitation	\$530,000.0
950	Confederation Basin Pedestrian Bridge	unnamed pathway over Dam (55 m North of Tanner Street)	44.327860	-76.166260	1979	Slab on Steel Girder	Pedestrian Bridge	79.8	4	41.80	3.85		\$1,600,000.0	\$1,276,800.0	None	\$0.0
13692	Power Canal Pedestrian Bridge	unnamed pathway over Dam (30 m South of Park Street)	44.328115	-76.165825	2015	Slab on Steel Girder	Pedestrian Bridge	62.2	1	9.00	2.10		\$250,000.0	\$155,500.0	None	\$0.0
13693	Riverside Loop Pedestrian Bridge	Riverside Loop Trail	44.337680	-76.175190	2004	Boardwalk	Pedestrian Bridge	72.7	1	5.80	1.22	0.80	\$35,000.0	\$25,445.0	None	\$0.0
14107	Narrows Loop South Pedestrian Bridge	Narrows Loop Trail	44.341475	-76.175270		Boardwalk	Pedestrian Bridge	71.6	1	3.55	1.20	0.90	\$20,000.0	\$14,320.0	None	\$0.0
14108	Stocking Hill Creek Pedestrian Bridge	Roger's Trail	44.340655	-76.164418		Boardwalk	Pedestrian Bridge	70.7	1	18.40	1.25		\$70,000.0	\$49,490.0	Minor Rehabilitation	\$17,500.0
14109	Grasshopper Park Pedestrian Bridge	River Trail	44.330666	-76.153366		Boardwalk	Pedestrian Bridge	71.1	1	6.20	1.20		\$35,000.0	\$24,885.0	None	\$0.0
14110	Arthur Street Pedestrian Bridge	River Trail	44.333300	-76.147055		Boardwalk	Pedestrian Bridge	72.0	10	26.80	1.50		\$60,000.0	\$43,200.0	None	\$0.0
14111	McLean Forest Pedestrian Bridge	River Trail	44.334070	-76.145620		Boardwalk	Pedestrian Bridge	68.0	2	6.60	1.55		\$50,000.0	\$34,000.0	Minor Rehabilitation	\$12,500.0
14112	Herbert I	Roger's Trail	44.339450	-76.160460		Boardwalk	Pedestrian Boardwalk	43.8	1	3.60	0.90		\$15,000.0	\$6,570.0	Replacement	\$18,750.0
14113	Herbert II	Roger's Trail	44.339530	-76.160280		Boardwalk	Pedestrian Boardwalk	75.0	1	2.45	0.80		\$20,000.0	\$15,000.0	None	\$0.0
14114	Herbert III	Roger's Trail	44.339710	-76.160150		Boardwalk	Pedestrian Boardwalk	75.0	1	3.80	0.80		\$15,000.0	\$11,250.0	None	\$0.0
14115	Herbert IV	Roger's Trail	44.341140	-76.158800		Boardwalk	Pedestrian Boardwalk	75.0	1	3.10	0.80		\$10,000.0	\$7,500.0	None	\$0.0
14116	Narrows Loop I (North)	Narrows Loop Trail	44.342910	-76.175850		Boardwalk	Pedestrian Boardwalk	75.0	1	3.40	1.20		\$20,000.0	\$15,000.0	None	\$0.0
14117	Riverside Loop I	Riverside Loop Trail	44.337690	-76.174760		Boardwalk	Pedestrian Boardwalk	75.0	1	5.20	1.20		\$25,000.0	\$18,750.0	None	\$0.0
14118	Riverside Loop II	Riverside Loop Trail	44.337487	-76.174359		Boardwalk	Pedestrian Boardwalk	56.1	1	7.44	1.20		\$30,000.0	\$16,830.0	Replacement	\$37,500.0
14119	Riverside Loop III	Riverside Loop Trail	44.336902	-76.173399		Boardwalk	Pedestrian Boardwalk	69.4	1	5.19	1.20		\$25,000.0	\$17,350.0	Replacement	\$31,250.0
14120	Riverside Loop IV	Riverside Loop Trail	44.336117	-76.172498		Boardwalk	Pedestrian Boardwalk	66.2	1	8.47	1.20		\$35,000.0	\$23,170.0	Replacement	\$43,750.0
14121	Snappers Loop I	Snappers Loop Trail	44.340320	-76.175130		Boardwalk	Pedestrian Boardwalk	64.1	1	1.85	0.70		\$15,000.0	\$9,615.0	Replacement	\$18,750.0
14122	Wilson 1		44.339760	-76.151580		Boardwalk	Pedestrian Boardwalk	75.0	1	2.45	0.60		\$15,000.0	\$11,250.0	None	\$0.0
Total:													\$14,925,000.0	\$10,881,565.0		\$1,070,000.0

Appendix B: *Anticipated Capital Costs*

Anticipated Capital Costs										
Structure ID	Structure Name	BCI	Rehabilitation/Replacement Cost	Approach Repair/Rehabilitation Costs	Detour Construction Cost	Traffic Control	Engineering Investigations	Design	Contract Administration	Total
14112	Herbert I	43.8	\$15,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,500.0	\$2,250.0	\$18,750.0
14118	Riverside Loop II	56.1	\$30,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3,000.0	\$4,500.0	\$37,500.0
951	Gananoque River Pedestrian Bridge (Rail to Trail)	56.4	\$240,000.0	\$0.0	\$0.0	\$40,000.0	\$20,000.0	\$24,000.0	\$36,000.0	\$360,000.0
953	Black (Snappers) Bridge	58.8	\$376,000.0	\$0.0	\$0.0	\$40,000.0	\$20,000.0	\$37,600.0	\$56,400.0	\$530,000.0
14121	Snappers Loop I	64.1	\$15,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,500.0	\$2,250.0	\$18,750.0
14120	Riverside Loop IV	66.2	\$35,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3,500.0	\$5,250.0	\$43,750.0
14119	Riverside Loop III	69.1	\$25,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2,500.0	\$3,750.0	\$31,250.0
14111	McLean Forest Pedestrian Bridge	68.0	\$10,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,000.0	\$1,500.0	\$12,500.0
14108	Stocking Hill Creek Pedestrian Bridge	70.7	\$14,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,400.0	\$2,100.0	\$17,500.0
		Total:	\$760,000.0					Total: \$1,070,000.0		

Appendix C: Capital Work 10-Year Plan

Capital Work 10-Year Plan (in \$1000's)																	
Structure ID	Structure Name	BCI	Repair Needs	Recommended Timing		Description	2025 (\$000)	2026 (\$000)	2027 (\$000)	2028 (\$000)	2029 (\$000)	2030 (\$000)	2031 (\$000)	2032 (\$000)	2033 (\$000)	2034 (\$000)	10-Year Plan (\$000)
				1 to 5 Years	6 to 10 Years												
14112	Herbert I	43.8	Replacement	✓		Design Construction & CA	\$1.500	\$17.250	\$3.000								\$18.750
14118	Riverside Loop II	56.1	Replacement	✓		Design Construction & CA				\$34.500							\$37.500
951	Gananoque River Pedestrian Bridge (Rail to Trail)	56.4	Major Rehabilitation	✓		Design Construction & CA	\$44.000	\$316.000									\$360.000
953	Black (Snappers) Bridge	58.8	Major Rehabilitation		✓	Design Construction & CA			\$57.600	\$472.400							\$530.000
14121	Snappers Loop I	64.1	Replacement		✓	Design Construction & CA					\$1.500	\$17.250					\$18.750
14120	Riverside Loop IV	66.2	Replacement		✓	Design Construction & CA					\$3.500	\$40.250					\$43.750
14119	Riverside Loop III	69.4	Replacement		✓	Design Construction & CA					\$2.500	\$28.750					\$31.250
14111	McLean Forest Pedestrian Bridge	68.0	Minor Rehabilitation		✓	Design Construction & CA					\$1.000	\$11.500					\$12.500
14108	Stocking Hill Creek Pedestrian Bridge	70.7	Minor Rehabilitation		✓	Design Construction & CA					\$1.400	\$16.100					\$17.500
Total:							\$45.500	\$333.250	\$60.600	\$506.900	\$9.900	\$113.850	\$0.000	\$0.000	\$0.000	\$0.000	\$1,070.000

Appendix D: *Additional Investigations*

Additional Investigations										
Structure ID	Structure Name	Type	BCI	Length (m)	Width (m)	Road Width (m)	Additional Investigations	Priority		
								Urgent	1 Year	2 Year
951	Gananoque River Pedestrian Bridge (Rail to Trail)	Timber Beam	56.4	31.6	1.8	0.0	Underwater Investigation		\$20,000.0	
953	Black (Snappers) Bridge	Pony Truss	58.8	36.0	6.2	1.3	Underwater Investigation		\$20,000.0	
13692	Power Canal Pedestrian Bridge	Slab on Steel Girder	62.2	9.0	2.1	0.0	Underwater Investigation		\$20,000.0	
Total Cost:								\$0.0	\$60,000.0	\$0.0

Appendix E: *Maintenance Needs*

Maintenance Needs										
Structure ID	Structure Name	Structure Type	BCI	Length (m)	Width (m)	Road Width (m)	Maintenance Needs	Priority		
								Ongoing	1 Year	2 Year
14108	Stocking Hill Creek Pedestrian Bridge	Boardwalk	70.7	18.4	1.3	0.0	To remove beaver dam and Debris.		\$3,000.0	
14109	Grasshopper Park Pedestrian Bridge	Boardwalk	71.1	6.2	1.2	0.0	To remove heavy vegetation.		\$2,000.0	
14122	Wilson 1	Boardwalk	75.0	2.5	0.6	0.0	To remove fallen trees.		\$1,500.0	
Total Costs:								\$0.0	\$6,500.0	\$0.0

Appendix F: Approach Rehabilitation Structures

Appendix G: *OSIM Reports*

Structure Condition Summary Form	
Structure Name:	Power Canal Pedestrian Bridge
Structure Number:	13692
Date of Inspection:	November 13, 2024
Assignment #:	24079
Consultant:	TSI Inc.

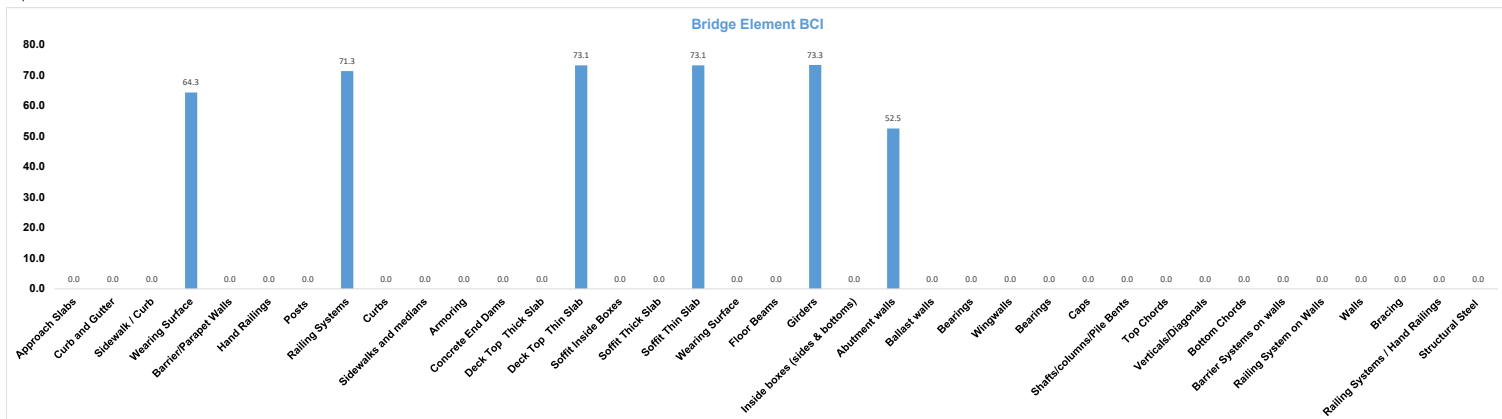
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index:	62.2
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Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
					(1.00)	(0.75)	(0.40)	(0.00)	(TRV)	0.0	0.0	0.0	
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	8.40		6.40	1.50	0.50	50.4	32.4	64.3		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	200.0	18.80		16.80	2.00		3760.0	2680.0	71.3		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	18.90		17.90	1.00		2268.0	1659.0	73.1		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	18.90		17.90	1.00		2268.0	1659.0	73.1		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	200.0	40.50		38.50	2.00		8100.0	5935.0	73.3		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0	20.00		10.80	6.00	3.20	18000.0	9450.0	52.5		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	34446.4	21415.4	62.2
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Inventory Data:

Structure Name: Power Canal Pedestrian Bridge					
Main Hwy/Road #:	unnamed pathway over Dam	Services on structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i>	<i>Ped.</i> ☒
	<i>On structure</i> ☒		<i>Rail</i>	<i>Road</i>	<i>Other</i>
	<i>Under structure</i>				
		Services under structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i> ☒	<i>Ped.</i>
			<i>Rail</i>	<i>Road</i>	<i>Other</i>
Structure Location: 30 m South of Park Street					
Latitude:	44.328115	Longitude:	-76.165825		
Owner/Custodian:	Town of Gananoque	Heritage	<i>Not Cons.</i>	<i>Cons./not App.</i>	<i>List/not Desig.</i>
		Designation:	<i>Desig./not List</i>	<i>Desig. & List</i>	
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i>	<i>Arterial</i>	
			<i>Collector</i>	<i>Local</i>	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Slab on Steel Girder	Interchange Number:			
Total Deck Length:	9.00 m	Interchange Structure Number:			
Overall Str. Width:	2.10 m	Min. Vertical Clearance: m			
Total Deck Area:	18.90 sq. m	Special Routes:	<i>Transit</i>	<i>Truck</i>	
Culvert Length:			<i>School</i>	<i>Bicycle</i>	
Roadway Width:		Detour Length Around Bridge: km			
Skew Angle:	Degrees	Traffic Directional Bound: North/South			
No. of Spans:	1.0	Fill on Structure: m			
Span Lengths:	9.00 m				

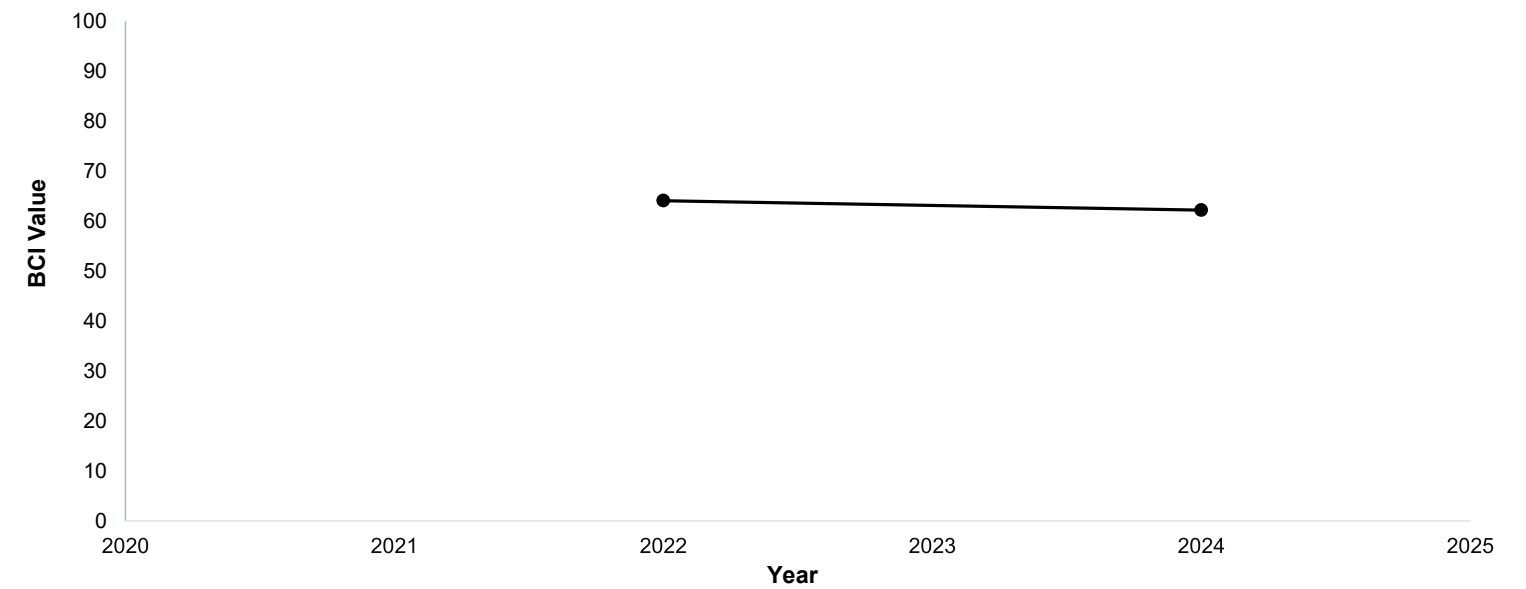
Historical Data:

Year Built:	2015	Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

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		2024	62.2		
Regular OSIM		2022	64.08		



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

Field Inspection Information:				
Date of Inspection:	November 13, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM
Inspector:	Ramin Rameshni, PhD, P.Eng.			
Others in Party:	Parisa Rameshni			
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.			
Weather:	Sunny			
Temperature:	4 °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 of Crack Widths:	X		
Investigation Notes: Limited inspection due to high water level. Need underwater investigation before any further decision.				
Overall Structure Notes:				
Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace
Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years	
Overall Comments:	Structure is generally in good condition. Evidence of wide cracks and scaling on abutment, corrosion on girder & railing system and crack on wearing surface was noted.			
Date of Next Inspection:	2026			

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:	Decks	Length:	9.00					
Element Name:	Deck Top– Thin Slab	Width:	2.10					
Location:	Top of Structure	Height:						
Material:	Cast-in-Place Concrete	Count (items):	1					
Element Type:	Exposed Wearing Surface	Total Quantity:	18.90 m ²					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		17.90	1.00		00		
Comments:	• Generally in good condition. • Evidence of light crack was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Barriers	Length:	9.40					
Element Name:	Railing Systems	Width:						
Location:	East & West of Structure	Height:	1.10					
Material:	Steel	Count (items):	2					
Element Type:		Total Quantity:	18.80 m					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m		16.80	2.00		00		
Comments:	• Evidence of medium rust was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Abutments	Length:						
Element Name:	Abutment walls	Width:	5.00					
Location:	North and South	Height:	2.00					
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:	Integral	Total Quantity:	20.00 m ²					
Environment:	Benign	Limited Inspection:	☒					
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		10.80	6.00	3.20			
Comments:	- Evidence of wide cracks and scaling was noted. (from previous report) - Limited inspection due to high water level.						00	
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 the structure	Height:						
Material:	Native	Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	N/A		All					
Comments:							00	
Recommended Work:	Rehab	Replace	Maintenance Needs:			00		
	1-5 years	6-10 years	Urgent	1 year	2 years			

Element Group:	Decks	Length:	9.00					
Element Name:	Soffit– Thin Slab	Width:	2.10					
Location:	Below the deck	Height:						
Material:	Corrugated Steel	Count (items):	1					
Element Type:		Total Quantity:	18.90 m ²					
Environment:	Moderate	Limited Inspection:	☒					
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		17.90	1.00		00		
Comments:	Limited access to soffit. It is rated according to deck top.							
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:	9.00					
Element Name:	Girders	Width:	0.30					
Location:	Below Deck	Height:	0.30					
Material:	Steel	Count (items):	2					
Element Type:		Total Quantity:	40.50 m ²					
Environment:	Moderate	Limited Inspection:	☒					
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		38.50	2.00		00		
Comments:	- Evidence of corrosion and coating loss was noted. (from previous report) - Limited inspection due to high water level.							
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:	2.10				
Location:	North and South Approaches	Height:					
Material:	Cast-in-Place Concrete	Count (items):	2				
Element Type:		Total Quantity:	8.40 m2				
Environment:	Moderate	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m2		6.40	1.50	0.50		
Comments:	• Evidence of wide crack was noted.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Embankments and Streams	Length:					
Element Name:	Embankments	Width:					
Location:	NE, NW, SE, SW	Height:					
Material:		Count (items):	4				
Element Type:		Total Quantity:	4.00 Each				
Environment:		Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	Each		4.00				
Comments:							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Foundations			Length:					
Element Name:	Foundation (Below Ground Level)			Width:					
Location:	Below Abutments walls...			Height:					
Material:				Count (items):					
Element Type:				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:	• 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

Structure Condition Summary Form	
Structure Name:	Power Canal Pedestrian Bridge
Structure Number:	13692
Date of Inspection:	November 13, 2024
Assignment #:	24079
Consultant:	TSI Inc.

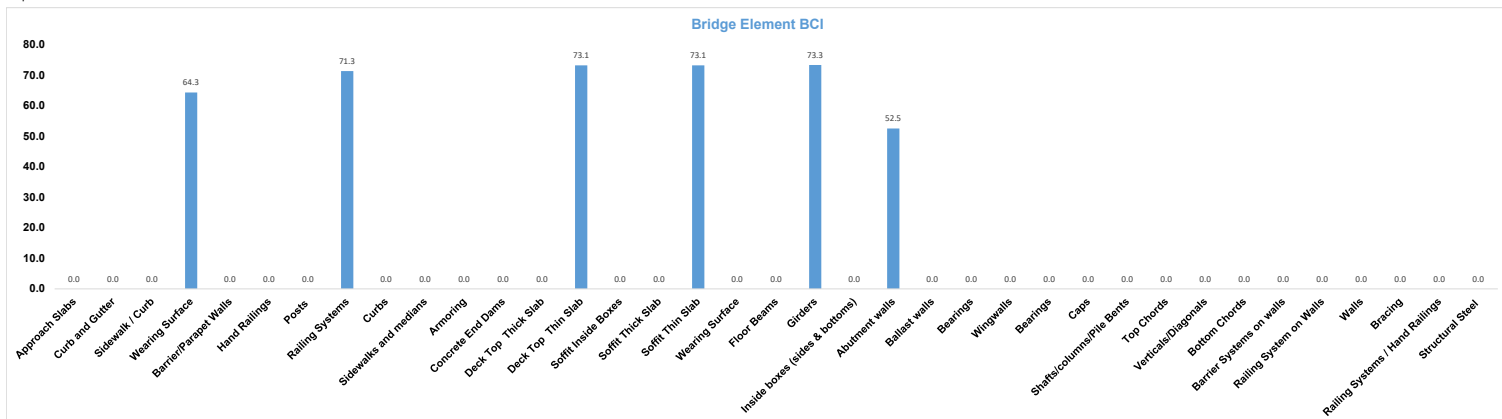
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index:	62.2
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Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
					(1.00)	(0.75)	(0.40)	(0.00)	(TRV)	0.0	0.0	0.0	
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	8.40		6.40	1.50	0.50	50.4	32.4	64.3		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	200.0	18.80		16.80	2.00		3760.0	2680.0	71.3		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	18.90		17.90	1.00		2268.0	1659.0	73.1		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	18.90		17.90	1.00		2268.0	1659.0	73.1		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	200.0	40.50		38.50	2.00		8100.0	5935.0	73.3		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0	20.00		10.80	6.00	3.20	18000.0	9450.0	52.5		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	34446.4	21415.4	62.2
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Inventory Data:

Structure Name: Power Canal Pedestrian Bridge					
Main Hwy/Road #:	unnamed pathway over Dam	Services on structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i>	<i>Ped.</i> ☒
	<i>On structure</i> ☒		<i>Rail</i>	<i>Road</i>	<i>Other</i>
	<i>Under structure</i>				
		Services under structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i> ☒	<i>Ped.</i>
			<i>Rail</i>	<i>Road</i>	<i>Other</i>
Structure Location: 30 m South of Park Street					
Latitude:	44.328115	Longitude:	-76.165825		
Owner/Custodian:	Town of Gananoque	Heritage	<i>Not Cons.</i>	<i>Cons./not App.</i>	<i>List/not Desig.</i>
		Designation:	<i>Desig./not List</i>	<i>Desig. & List</i>	
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i>	<i>Arterial</i>	
			<i>Collector</i>	<i>Local</i>	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Slab on Steel Girder	Interchange Number:			
Total Deck Length:	9.00 m	Interchange Structure Number:			
Overall Str. Width:	2.10 m	Min. Vertical Clearance: m			
Total Deck Area:	18.90 sq. m	Special Routes:	<i>Transit</i>	<i>Truck</i>	
Culvert Length:			<i>School</i>	<i>Bicycle</i>	
Roadway Width:		Detour Length Around Bridge: km			
Skew Angle:	Degrees	Traffic Directional Bound: North/South			
No. of Spans:	1.0	Fill on Structure: m			
Span Lengths:	9.00 m				

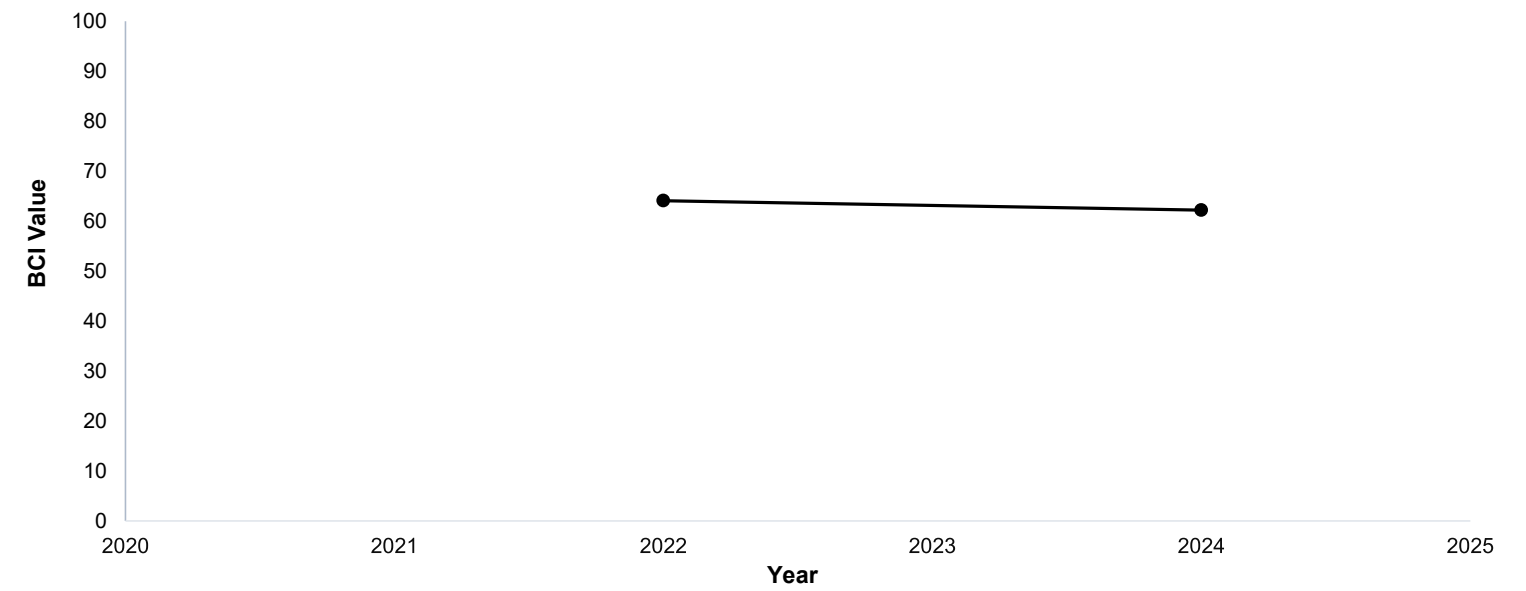
Historical Data:

Year Built:	2015	Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

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		2024	62.2		
Regular OSIM		2022	64.08		



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

Field Inspection Information:																																																																																															
Date of Inspection:	November 13, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM																																																																																											
Inspector:	Ramin Rameshni, PhD, P.Eng.																																																																																														
Others in Party:	Parisa Rameshni																																																																																														
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.																																																																																														
Weather:	Sunny																																																																																														
Temperature:	4 °C																																																																																														
Additional Investigations Required:			<table border="1"> <thead> <tr> <th colspan="3">Priority</th> </tr> <tr> <th>None</th> <th>Normal</th> <th>Urgent</th> </tr> </thead> <tbody> <tr> <td colspan="3">Material Condition Survey</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>Detailed Deck Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Non-Destructive Delamination Survey of Asphalt-Covered Deck:</td> <td>X</td> <td></td> </tr> <tr> <td>Concrete Substructure Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Detailed Coating Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Detailed Timber Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Post-Tensioned Strand Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Underwater Investigation:</td> <td></td> <td>X</td> </tr> <tr> <td>Fatigue Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Seismic Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Structure Evaluation:</td> <td>X</td> <td></td> </tr> <tr> <td colspan="3">Monitoring</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>Monitoring of Deformations, Settlements and Movements:</td> <td>X</td> <td></td> </tr> <tr> <td>Monitoring of Crack Widths:</td> <td>X</td> <td></td> </tr> <tr> <td colspan="3">Investigation Notes:</td> </tr> <tr> <td colspan="3">Limited inspection due to high water level. Need underwater investigation before any further decision.</td> </tr> <tr> <td colspan="6">Overall Structure Notes:</td> </tr> <tr> <td>Recommended Work on Structure:</td> <td>☒ None</td> <td>☐ Minor Rehab.</td> <td>☐ Major Rehab.</td> <td>☐ Replace</td> <td></td> </tr> <tr> <td>Timing of Recommended Work:</td> <td></td> <td>☐ 1 to 5 years</td> <td>☐ 6 to 10 years</td> <td></td> <td></td> </tr> <tr> <td>Overall Comments:</td> <td colspan="5">Structure is generally in good condition. Evidence of wide cracks and scaling on abutment, corrosion on girder & railing system and crack on wearing surface was noted.</td> </tr> <tr> <td>Date of Next Inspection:</td> <td colspan="5">2026</td> </tr> </tbody></table>			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 of Crack Widths:	X		Investigation Notes:			Limited inspection due to high water level. Need underwater investigation before any further decision.			Overall Structure Notes:						Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace		Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years			Overall Comments:	Structure is generally in good condition. Evidence of wide cracks and scaling on abutment, corrosion on girder & railing system and crack on wearing surface was noted.					Date of Next Inspection:	2026				
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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:	Decks	Length:	9.00					
Element Name:	Deck Top– Thin Slab	Width:	2.10					
Location:	Top of Structure	Height:						
Material:	Cast-in-Place Concrete	Count (items):	1					
Element Type:	Exposed Wearing Surface	Total Quantity:	18.90 m ²					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		17.90	1.00		00		
Comments:	• Generally in good condition. • Evidence of light crack was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Barriers	Length:	9.40					
Element Name:	Railing Systems	Width:						
Location:	East & West of Structure	Height:	1.10					
Material:	Steel	Count (items):	2					
Element Type:		Total Quantity:	18.80 m					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m		16.80	2.00		00		
Comments:	• Evidence of medium rust was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Abutments	Length:						
Element Name:	Abutment walls	Width:	5.00					
Location:	North and South	Height:	2.00					
Material:	Cast-in-Place Concrete	Count (items):	2					
Element Type:	Integral	Total Quantity:	20.00 m ²					
Environment:	Benign	Limited Inspection:	☒					
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		10.80	6.00	3.20			
Comments:	- Evidence of wide cracks and scaling was noted. (from previous report) - Limited inspection due to high water level.						00	
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 the structure	Height:						
Material:	Native	Count (items):						
Element Type:		Total Quantity:	All N/A					
Environment:	Benign	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	N/A		All					
Comments:							00	
Recommended Work:	Rehab	Replace	Maintenance Needs:			00		
	1-5 years	6-10 years	Urgent	1 year	2 years			

Element Group:	Decks	Length:	9.00						
Element Name:	Soffit– Thin Slab	Width:	2.10						
Location:	Below the deck	Height:							
Material:	Corrugated Steel	Count (items):	1						
Element Type:		Total Quantity:	18.90 m ²						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		17.90	1.00		00			
Comments:	Limited access to soffit. It is rated according to deck top.								
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:	9.00						
Element Name:	Girders	Width:	0.30						
Location:	Below Deck	Height:	0.30						
Material:	Steel	Count (items):	2						
Element Type:		Total Quantity:	40.50 m ²						
Environment:	Moderate	Limited Inspection:	☒						
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		38.50	2.00		00			
Comments:	- Evidence of corrosion and coating loss was noted. (from previous report) - Limited inspection due to high water level.								
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:	2.10						
Location:	North and South Approaches	Height:							
Material:	Cast-in-Place Concrete	Count (items):	2						
Element Type:		Total Quantity:	8.40 m2						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		6.40	1.50	0.50	00			
Comments:	• Evidence of wide crack 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:	Embankments	Width:							
Location:	NE, NW, SE, SW	Height:							
Material:		Count (items):	4						
Element Type:		Total Quantity:	4.00 Each						
Environment:		Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00			00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Foundations			Length:					
Element Name:	Foundation (Below Ground Level)			Width:					
Location:	Below Abutments walls...			Height:					
Material:				Count (items):					
Element Type:				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:	• 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

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 1 : East Elevation



Figure 2 : West Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 3 : Bridge Looking North



Figure 4 : Bridge Looking South

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street

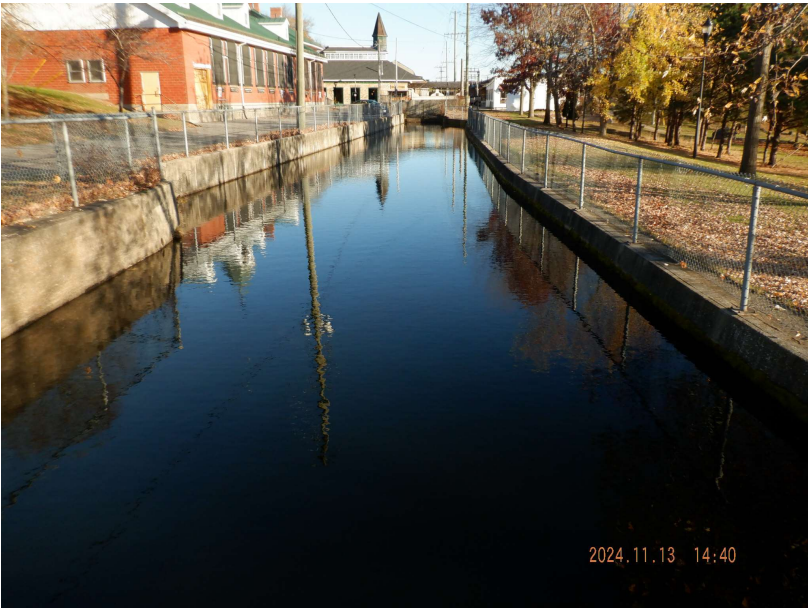


Figure 5 : Stream Looking East (D/S)



Figure 6 : Stream Looking West (U/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street

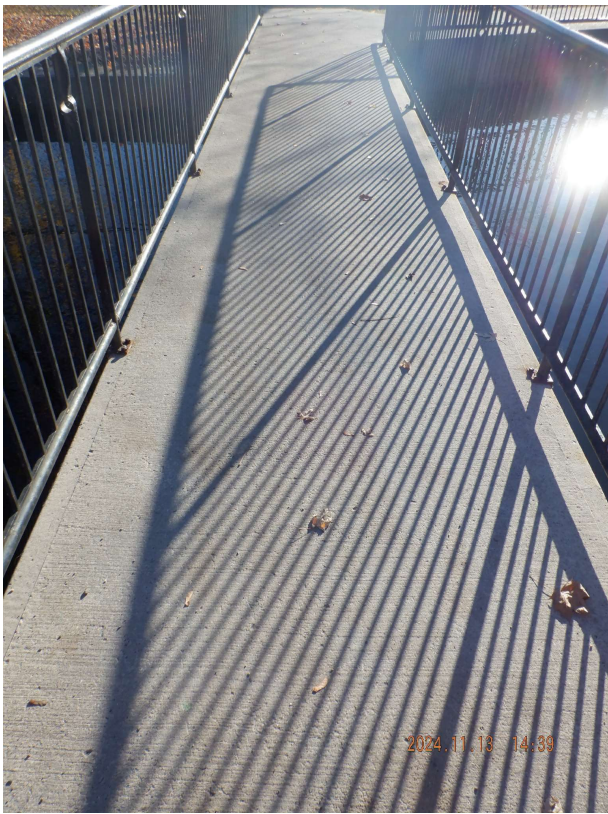


Figure 7 : Bridge Deck (Typ.)



Figure 8 : West Railing

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 9 : East Railing



Figure 10 : Exterior Railing & Fascia-Evidence of Medium Rust

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 11 : North Approach



Figure 12 : South Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 13 : NW Embankment



Figure 14 : SW Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 15 : SE Embankment

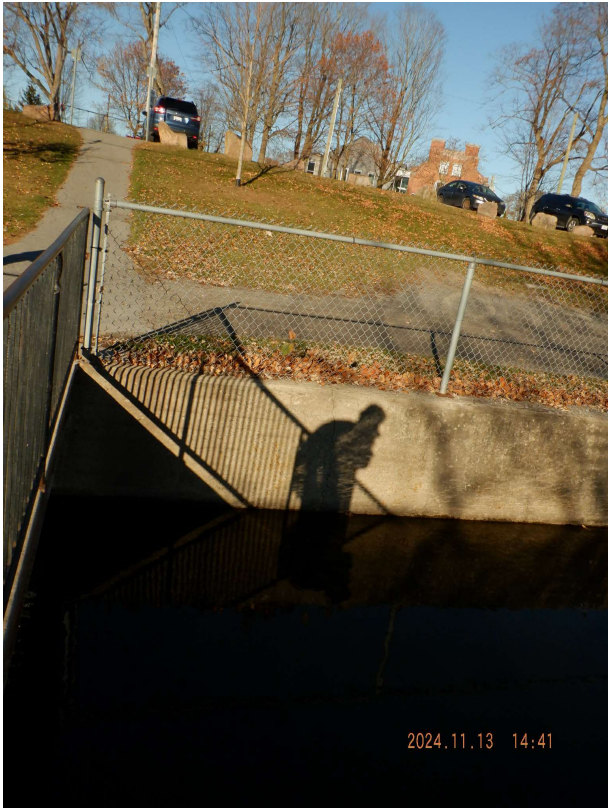


Figure 16 : NE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Power Canal Pedestrian Bridge

Hwy/Road Name: unnamed pathway over Dam

Location: 30 m South of Park Street



Figure 17 : Overhead Utility-North

Structure Condition Summary Form

Structure Name:	Riverside Loop Pedestrian Bridge
Structure Number:	13693
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

Bridge Condition Index (BCI): 72.7

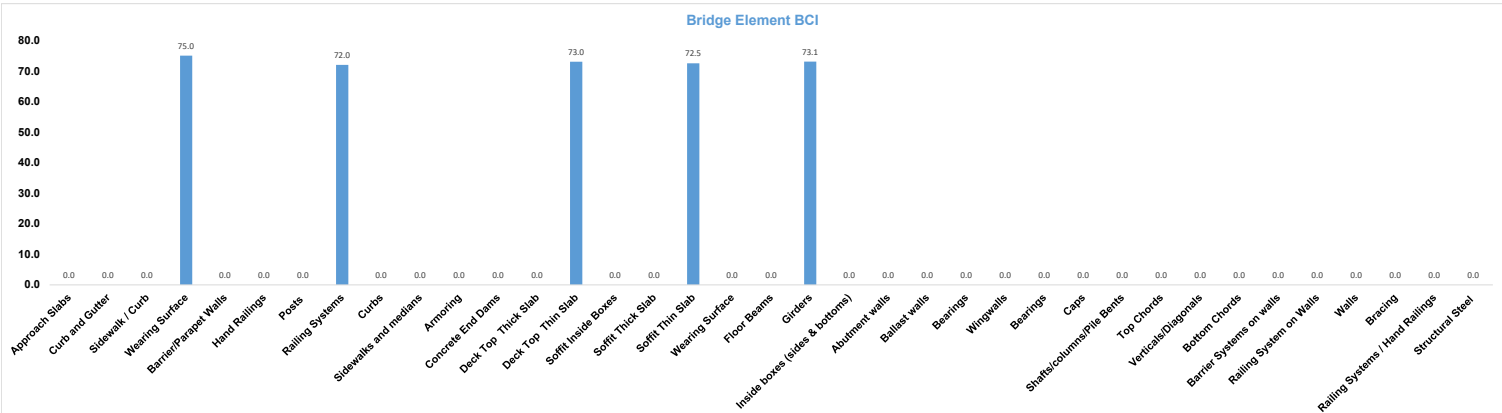
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index: 72.7

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)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	2.44		2.44			14.6	11.0	75.0		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	100.0	11.60		10.60	1.00		1160.0	835.0	72.0		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	7.08		6.68	0.40		849.1	620.0	73.0		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	7.08		6.58	0.50		849.1	615.8	72.5		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	150.0	14.50		13.70	0.80		2175.0	1589.3	73.1		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0						0.0	0.0	0.0		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	5047.9	3671.1	72.7
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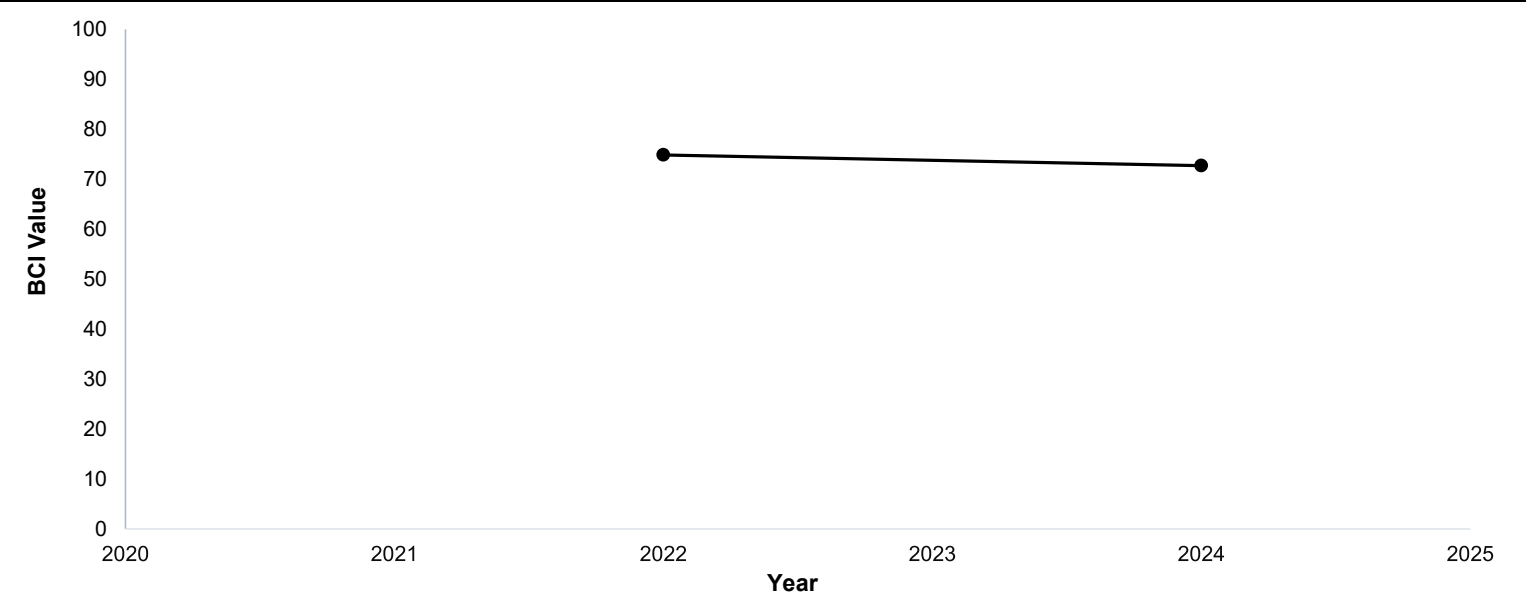
Structure Name:		Riverside Loop Pedestrian Bridge									
Main Hwy/Road #:	Riverside Loop Trail		Services on structure:	Navig. Water		Non-Navig. Water		Ped.		☒	
	On structure	☒		Rail		Road		Other			
	Under structure										
			Services under structure:	Navig. Water		Non-Navig. Water		Ped.			
				Rail		Road		Other			
Structure Location:		250 m North of Nalon Road									
Latitude:		44.33768		Longitude:		-76.17519					
Owner/Custodian:	Town of Gananoque			Heritage	Not Cons.		Cons./not App.		List/not Desig.		
				Designation:	Desig./not List		Desig. & List				
MTO Region:	Eastern Region			Hwy Class:	Freeway		Arterial				
					Collector		Local				
MTO District:	Kingston			Posted Speed:			No. of Lanes:	1			
Old County:	Leeds and Grenville			AADT:			% Trucks:				
Township:	Leeds			Inspection Route Sequence:							
Structure Type:	Boardwalk			Interchange Number:							
Total Deck Length:	5.80		m		Interchange Structure Number:						
Overall Str. Width:	1.22		m		Min. Vertical Clearance:						
Total Deck Area:	7.08		sq. m		Special Routes:	Transit		Truck			
Culvert Length:			m			School		Bicycle			
Roadway Width:	0.8		m		Detour Length Around Bridge:						
Skew Angle:			Degrees		Traffic Directional Bound:		East/West				
No. of Spans:	1.0				Fill on Structure:						
Span Lengths:	5.80										

Year Built:	2004	Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:	2022	Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

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		2024	72.7		
Regular OSIM		2022	74.84		



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

Field Inspection Information:					
Date of Inspection:	November 23, 2024	Type of Inspection:	☒ Reg. OSIM	☐ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Cloudy				
Temperature:	7 °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 of Crack Widths:		X		
Investigation Notes:					
Overall Structure Notes:					
Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace	
Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years		
Overall Comments:	Structure is generally in good condition.				
Date of Next Inspection:	2026				

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:	Decks	Length:	5.80				
Element Name:	Deck Top– Thin Slab	Width:	1.22				
Location:	Top of Structure	Height:					
Material:	Wood	Count (items):	1				
Element Type:	Exposed Wearing Surface	Total Quantity:	7.08 m ²				
Environment:	Severe	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m2		6.68	0.40		00	
Comments:	• Generally in good condition. • Evidence of light weathering was noted. • Evidence of gravel was noted on deck top.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Barriers	Length:	5.80				
Element Name:	Railing Systems	Width:					
Location:	North & South of Structure	Height:	1.10				
Material:	Wood	Count (items):	2				
Element Type:		Total Quantity:	11.60 m				
Environment:	Moderate	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m		10.60	1.00		00	
Comments:	• Evidence of light weathering was noted. • Bracing at the southwest corner has become detached from the railing.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Embankments and Streams				Length:				
Element Name:	Embankments				Width:				
Location:	NE, NW, SE, SW				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent		1 year	2 years

Element Group:	Decks	Length:	5.80					
Element Name:	Soffit– Thin Slab	Width:	1.22					
Location:	Below the deck	Height:						
Material:	Wood	Count (items):	1					
Element Type:		Total Quantity:	7.08 m ²					
Environment:	Moderate	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		6.58	0.50		00		
Comments:								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Approaches	Length:	1.00					
Element Name:	Wearing Surface	Width:	1.22					
Location:	East & West	Height:						
Material:	Native	Count (items):	2					
Element Type:		Total Quantity:	2.44 m ²					
Environment:	Benign	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		2.44			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:	Beams/Main Longitudinal Element (MLE'S)	Length:	5.80						
Element Name:	Girders	Width:	0.25						
Location:	North & South	Height:	0.25						
Material:	Wood	Count (items):	2						
Element Type:		Total Quantity:	14.50 m ²						
Environment:	Benign	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		13.70	0.80		00			
Comments:	Generally in good condition.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Riverside Loop Pedestrian Bridge

Hwy/Road Name: Riverside Loop Trail

Location: 250 m North of Nalon Road



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Riverside Loop Pedestrian Bridge

Hwy/Road Name: Riverside Loop Trail

Location: 250 m North of Nalon Road



Figure 3 : East Approach



Figure 4 : West Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Riverside Loop Pedestrian Bridge

Hwy/Road Name: Riverside Loop Trail

Location: 250 m North of Nalon Road



Figure 5 : Creek Looking North (D/S)



Figure 6 : Creek Looking South (U/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Riverside Loop Trail

Structure Name: Riverside Loop Pedestrian Bridge
Location: 250 m North of Nalon Road

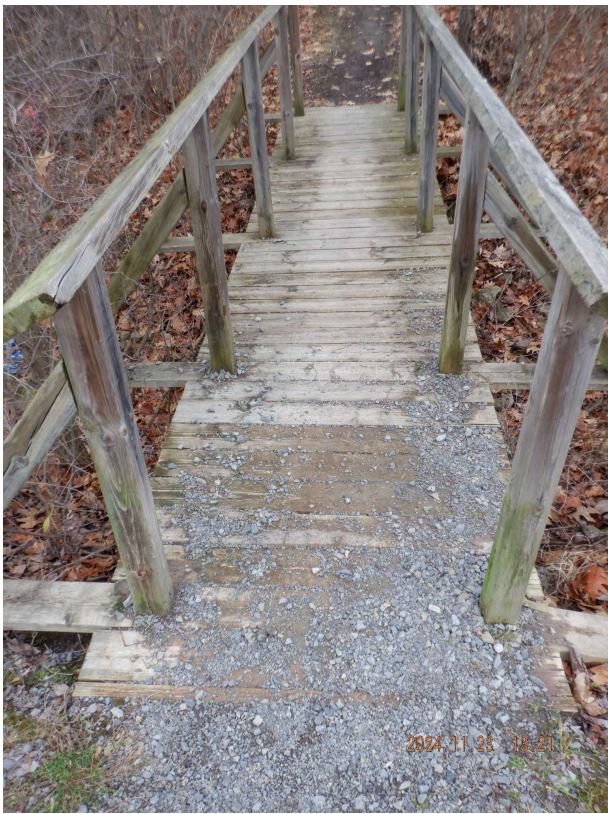


Figure 7 : Bridge Deck



Figure 8 : East Steps

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Riverside Loop Trail

Structure Name: Riverside Loop Pedestrian Bridge
Location: 250 m North of Nalon Road

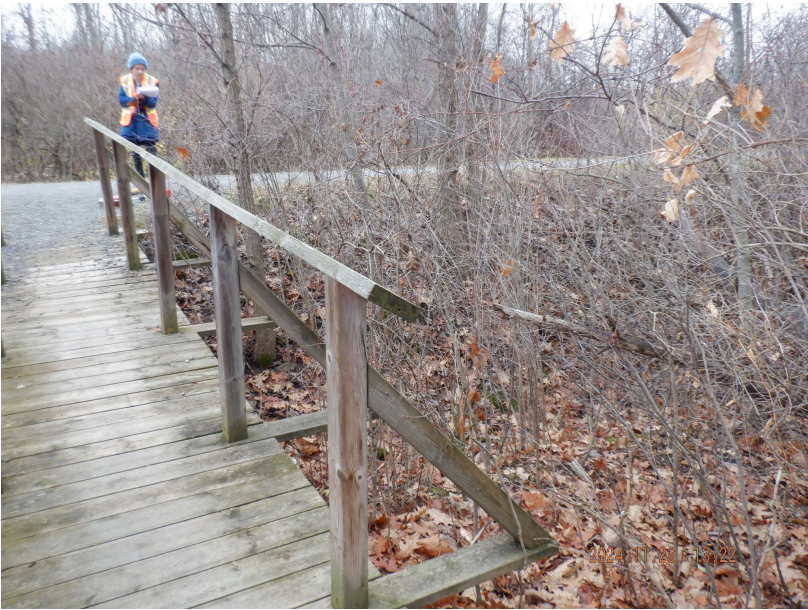


Figure 9 : North Railing



Figure 10 : South Railing

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Riverside Loop Trail

Structure Name: Riverside Loop Pedestrian Bridge
Location: 250 m North of Nalon Road



Figure 11 : NE Embankment



Figure 12 : NW Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Riverside Loop Pedestrian Bridge

Hwy/Road Name: Riverside Loop Trail

Location: 250 m North of Nalon Road



Figure 13 : SW Embankment



Figure 14 : SE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Riverside Loop Pedestrian Bridge

Hwy/Road Name: Riverside Loop Trail

Location: 250 m North of Nalon Road



Figure 15 : Soffit (Typ.)

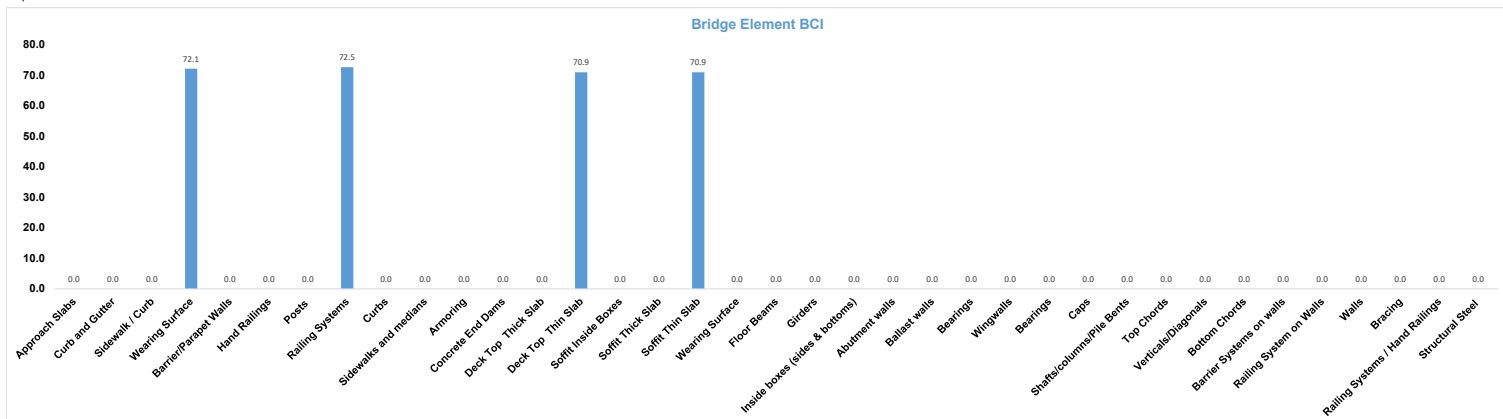
Structure Name:	Narrows Loop South Pedestrian Bridge
Structure Number:	14107
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

Bridge Condition Index (BCI):	71.6
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment
Bridge Sufficiency Index:	71.6

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)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	2.40		2.20	0.20		14.4	10.4	72.1		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	100.0	7.10		6.60	0.50		710.0	515.0	72.5		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	4.26		3.76	0.50		511.2	362.4	70.9		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	4.26		3.76	0.50		511.2	362.4	70.9		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	200.0						0.0	0.0	0.0		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0						0.0	0.0	0.0		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	1746.8	1250.2	71.6
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Inventory Data:

Structure Name: Narrows Loop South Pedestrian Bridge					
Main Hwy/Road #:	Narrows Loop Trail	Services on structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i>	<i>Ped.</i> ☒
	<i>On structure</i> ☒		<i>Rail</i>	<i>Road</i>	<i>Other</i>
	<i>Under structure</i>				
		Services under structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i> ☒	<i>Ped.</i>
			<i>Rail</i>	<i>Road</i>	<i>Other</i>
Structure Location:					
Latitude:	44.341475	Longitude:	-76.17527		
Owner/Custodian:	Town of Gananoque	Heritage	<i>Not Cons.</i>	<i>Cons./not App.</i>	<i>List/not Desig.</i>
		Designation:	<i>Desig./not List</i>	<i>Desig. & List</i>	
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i>	<i>Arterial</i>	
			<i>Collector</i>	<i>Local</i> ☒	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Boardwalk	Interchange Number:			
Total Deck Length:	3.55 m	Interchange Structure Number:			
Overall Str. Width:	1.20 m	Min. Vertical Clearance:	m		
Total Deck Area:	4.26 sq. m	Special Routes:	<i>Transit</i>	<i>Truck</i>	
Culvert Length:			<i>School</i>	<i>Bicycle</i>	
Roadway Width:	0.9 m	Detour Length Around Bridge:	km		
Skew Angle:	Degrees	Traffic Directional Bound:	North/South		
No. of Spans:	1.0	Fill on Structure:	m		
Span Lengths:	3.55 m				

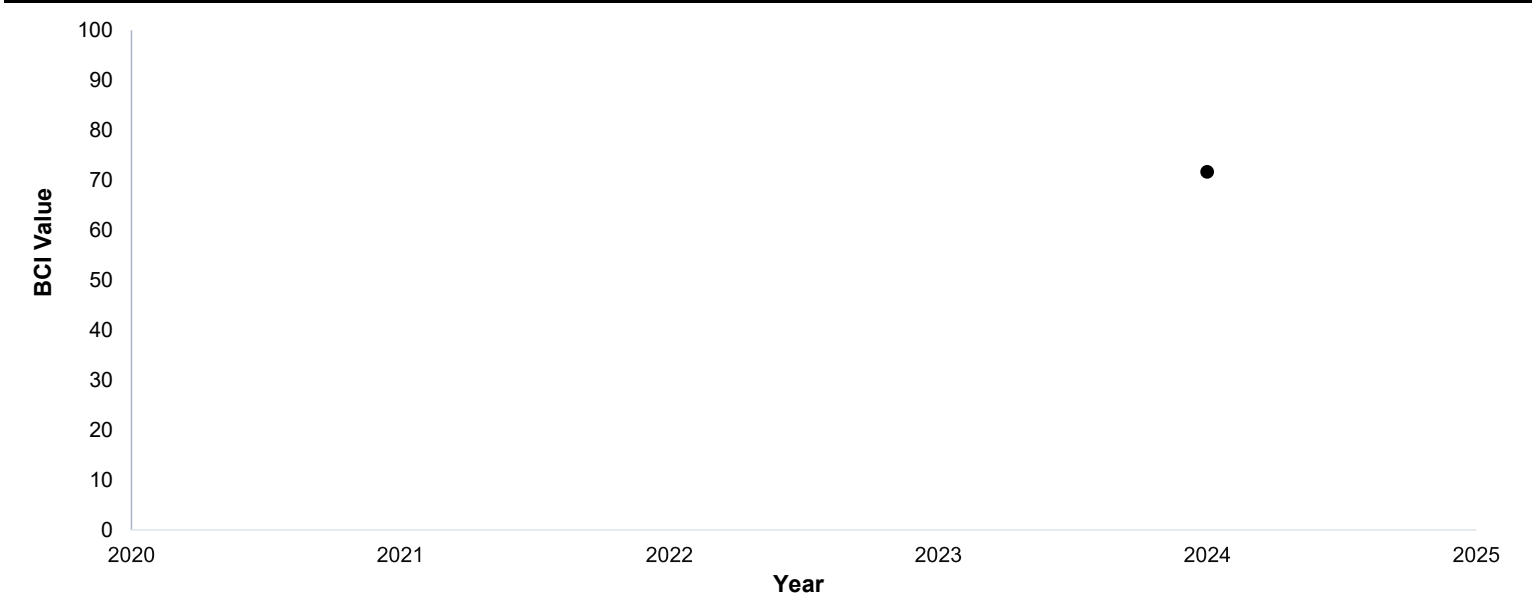
Historical Data:

Year Built:		Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:		Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Enhanced OSIM		2024	71.6		



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

Field Inspection Information:					
Date of Inspection:	November 23, 2024	Type of Inspection:	☐ Reg. OSIM	☒ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Cloudy				
Temperature:	7 °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 of Crack Widths:		X		
Investigation Notes:					
Overall Structure Notes:					
Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace	
Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years		
Overall Comments:	Structure is generally in good condition.				
Date of Next Inspection:	2026				

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:	Decks	Length:	3.55					
Element Name:	Deck Top– Thin Slab	Width:	1.20					
Location:	Top of Structure	Height:						
Material:	Wood	Count (items):	1					
Element Type:	Exposed Wearing Surface	Total Quantity:	4.26 m ²					
Environment:	Severe	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		3.76	0.50		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:	3.55					
Element Name:	Railing Systems	Width:						
Location:	East & West of Structure	Height:	1.10					
Material:	Wood	Count (items):	2					
Element Type:		Total Quantity:	7.10 m					
Environment:	Moderate	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m		6.60	0.50		00		
Comments:								
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				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent		1 year	2 years

Element Group:	Decks	Length:	3.55						
Element Name:	Soffit– Thin Slab	Width:	1.20						
Location:	Below the deck	Height:							
Material:	Wood	Count (items):	1						
Element Type:		Total Quantity:	4.26 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		3.76	0.50		00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Approaches	Length:	1.00						
Element Name:	Wearing Surface	Width:	1.20						
Location:	North & South	Height:							
Material:	Native	Count (items):	2						
Element Type:		Total Quantity:	2.40 m ²						
Environment:	Benign	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		2.20	0.20		00			
Comments:	Generally in good condition.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Narrows Loop Trail

Structure Name: Narrows Loop South Pedestrian Bridge
Location: N/A



Figure 1 : East Elevation



Figure 2 : West Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Narrows Loop Trail

Structure Name: Narrows Loop South Pedestrian Bridge
Location: N/A



Figure 3 : North Approach



Figure 4 : South Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Narrows Loop Trail

Structure Name: Narrows Loop South Pedestrian Bridge
Location: N/A

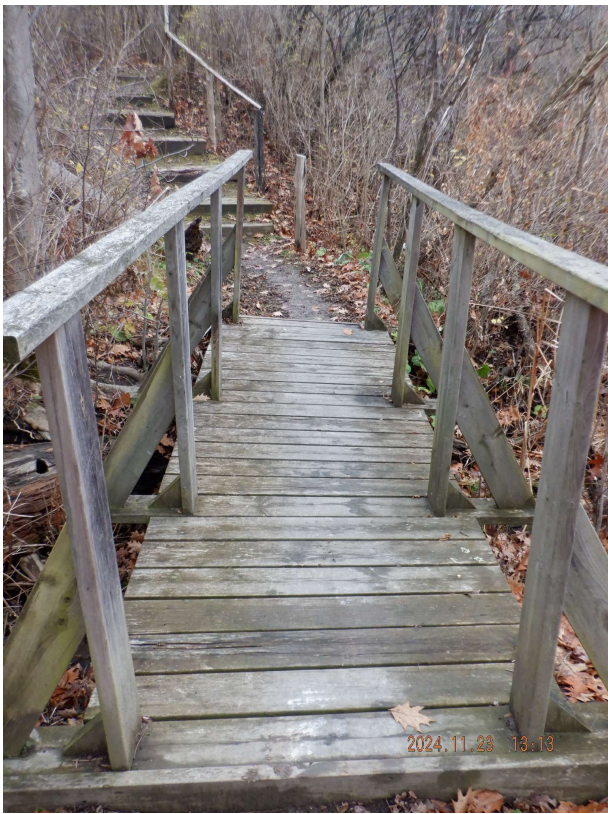


Figure 5 : Bridge Deck (Typ.)



Figure 6 : West Railing

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Narrows Loop Trail

Structure Name: Narrows Loop South Pedestrian Bridge
Location: N/A



Figure 7 : East Railing



Figure 8 : Soffit

Structure Condition Summary Form	
Structure Name:	Stocking Hill Creek Pedestrian Bridge
Structure Number:	14108
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

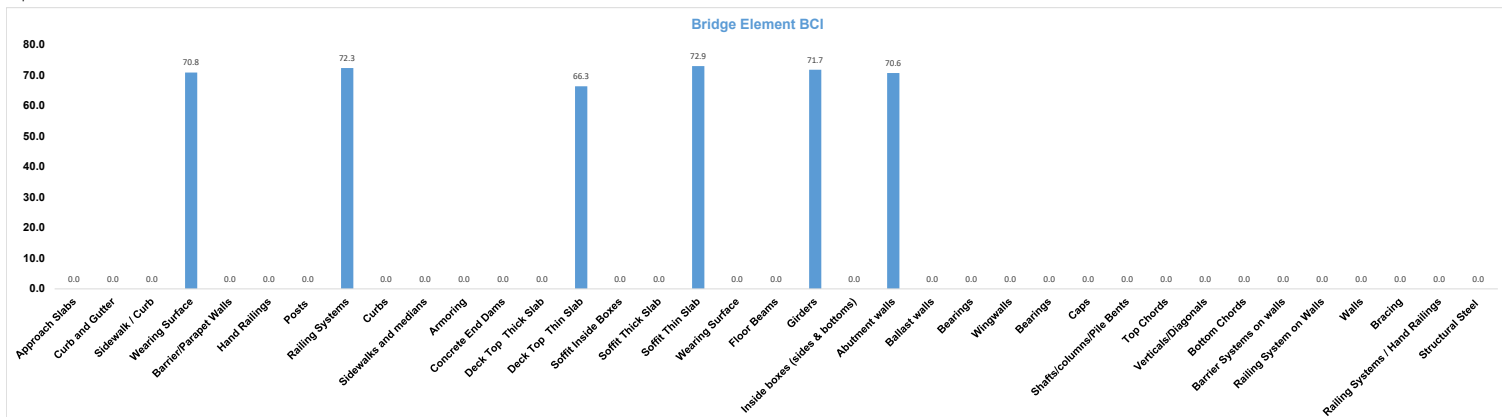
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index: 70.7

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
					(1.00)	(0.75)	(0.40)	(0.00)	(TRV)	0.0	0.0		
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	2.50		2.20	0.30		15.0	10.6	70.8		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	200.0						0.0	0.0	0.0		
	Railing Systems	m.	100.0	36.80		34.40	2.00	0.40	3680.0	2660.0	72.3		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	23.00		18.20	4.00	0.80	2760.0	1830.0	66.3		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	20.00		18.80	1.20		2400.0	1749.6	72.9		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	150.0	12.80		11.60	1.20		1920.0	1377.0	71.7		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0	4.00		3.50	0.50		3600.0	2542.5	70.6		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	14375.0	10169.7	70.7
---------------	----------------	----------------	-------------



Inventory Data:

Structure Name: Stocking Hill Creek Pedestrian Bridge					
Main Hwy/Road #:	Roger's Trail	Services on structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i>	<i>Ped.</i> ☒
	On structure ☒		<i>Rail</i>	<i>Road</i>	<i>Other</i>
	Under structure				
		Services under structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i> ☒	<i>Ped.</i>
			<i>Rail</i>	<i>Road</i>	<i>Other</i>
Structure Location:					
Latitude:	44.340655	Longitude:	-76.164418		
Owner/Custodian:	Town of Gananoque	Heritage	<i>Not Cons.</i>	<i>Cons./not App.</i>	<i>List/not Desig.</i>
		Designation:	<i>Desig./not List</i>	<i>Desig. & List</i>	
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i>	<i>Arterial</i>	
			<i>Collector</i>	<i>Local</i> ☒	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Boardwalk	Interchange Number:			
Total Deck Length:	18.40 m	Interchange Structure Number:			
Overall Str. Width:	1.25 m	Min. Vertical Clearance: m			
Total Deck Area:	23.00 sq. m	Special Routes:	<i>Transit</i>	<i>Truck</i>	
Culvert Length:			<i>School</i>	<i>Bicycle</i>	
Roadway Width:		Detour Length Around Bridge: km			
Skew Angle:	Degrees	Traffic Directional Bound: East/West			
No. of Spans:	1.0	Fill on Structure: m			
Span Lengths:	18.40 m				

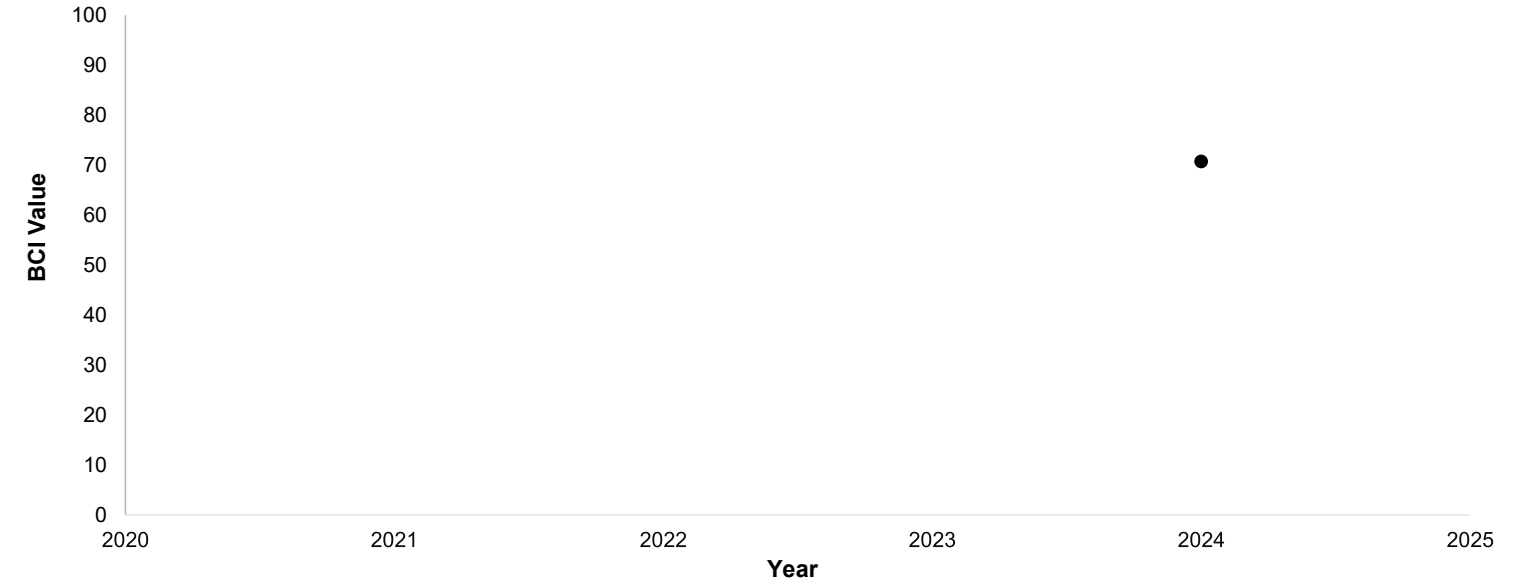
Historical Data:

Year Built:		Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:		Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Enhanced OSIM		2024	70.7		



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

Field Inspection Information:																																																																				
Date of Inspection:	November 23, 2024	Type of Inspection:	☐ Reg. OSIM	☒ Enhanced OSIM																																																																
Inspector:	Ramin Rameshni, PhD, P.Eng.																																																																			
Others in Party:	Parisa Rameshni																																																																			
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.																																																																			
Weather:	Cloudy																																																																			
Temperature:	7 °C																																																																			
Additional Investigations Required:		<table border="1"> <thead> <tr> <th></th> <th colspan="3">Priority</th> </tr> <tr> <th></th> <th>None</th> <th>Normal</th> <th>Urgent</th> </tr> </thead> <tbody> <tr> <td>Material Condition Survey</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Detailed Deck Condition Survey:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Non-Destructive Delamination Survey of Asphalt-Covered Deck:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Concrete Substructure Condition Survey:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Detailed Coating Condition Survey:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Detailed Timber Investigation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Post-Tensioned Strand Investigation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Underwater Investigation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Fatigue Investigation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Seismic Investigation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Structure Evaluation:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Monitoring</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Monitoring of Deformations, Settlements and Movements:</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Monitoring of Crack Widths:</td> <td>X</td> <td></td> <td></td> </tr> </tbody> </table>				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 of Crack Widths:	X		
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Monitoring of Crack Widths:	X																																																																			
Investigation Notes:																																																																				
Overall Structure Notes:																																																																				
Recommended Work on Structure:	☐ None	☒ Minor Rehab.	☐ Major Rehab.	☐ Replace																																																																
Timing of Recommended Work:	☐ 1 to 5 years	☒ 6 to 10 years																																																																		
Overall Comments:	Structure is generally in good condition. Evidence of broken plank on deck top, loose connection & rot on railing was noted. Minor rehab is recommended to fix railing and repair board. Maintenance repair is recommended to remove beaver dam and debris.																																																																			
Date of Next Inspection:	2026																																																																			

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:	Decks	Length:	18.40					
Element Name:	Deck Top– Thin Slab	Width:	1.25					
Location:	Top of Structure	Height:						
Material:	Wood	Count (items):	1					
Element Type:	Exposed Wearing Surface	Total Quantity:	23.00 m ²					
Environment:	Severe	Limited Inspection:						
Protection System:	None					Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		18.20	4.00	0.80	00		
Comments:	• Evidence of broken plank was noted.							
Recommended Work:	☒	Rehab		Replace	Maintenance Needs:		00	
		1-5 years	☒	6-10 years		Urgent	1 year	2 years

Element Group:	Barriers	Length:	18.40					
Element Name:	Railing Systems	Width:						
Location:	North & South of Structure	Height:	1.10					
Material:	Wood	Count (items):	2					
Element Type:		Total Quantity:	36.80 m					
Environment:	Moderate	Limited Inspection:						
Protection System:	None					Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m		34.40	2.00	0.40	00		
Comments:	• Evidence of loose connection & rot 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:	Embankments				Width:				
Location:	NE, NW, SE, SW				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:	Evidence of beaver dam and banches was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		18		
		1-5 years		6-10 years		Urgent		1 year	2 years
To remove beaver dam and debris.									

Element Group:	Decks	Length:	16.00						
Element Name:	Soffit– Thin Slab	Width:	1.25						
Location:	Below the deck	Height:							
Material:	Wood	Count (items):	1						
Element Type:		Total Quantity:	20.00 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		18.80	1.20		00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Approaches	Length:	1.00						
Element Name:	Wearing Surface	Width:	1.25						
Location:	East & West	Height:							
Material:	Native	Count (items):	2						
Element Type:		Total Quantity:	2.50 m ²						
Environment:	Benign	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		2.20	0.30		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:	Abutments	Length:	1.00						
Element Name:	Abutment walls	Width:	1.00						
Location:	East and West	Height:	0.50						
Material:	Wood	Count (items):	2						
Element Type:	Abutment crib	Total Quantity:	4.00 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		3.50	0.50		00			
Comments:									
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:	16.00						
Element Name:	Girders	Width:	0.20						
Location:	North & South	Height:							
Material:	Wood	Count (items):	2						
Element Type:		Total Quantity:	12.80 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		11.60	1.20		00			
Comments:	Generally in good condition.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A

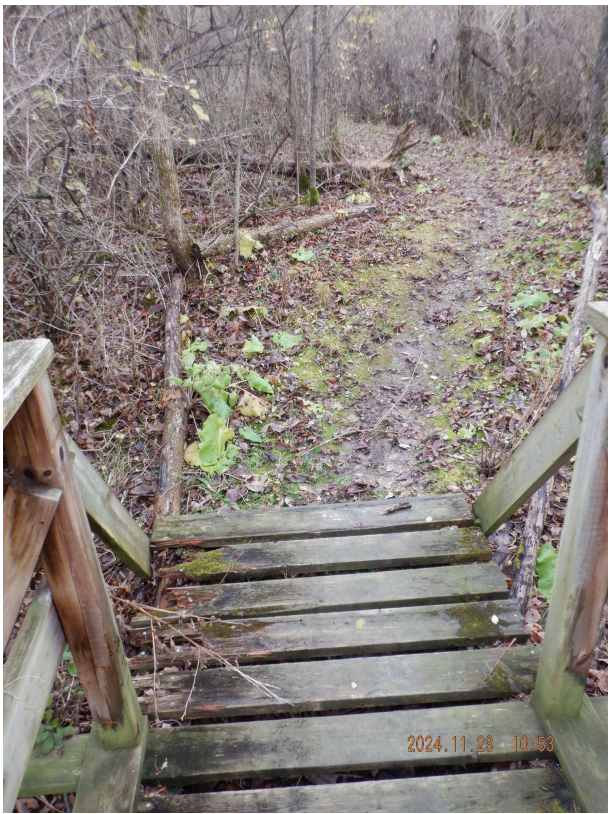


Figure 3 : East Approach



Figure 4 : West Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 5 : Stream Looking North (U/S)



Figure 6 : Stream Looking South (D/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 7 : West Approach-Staircase



Figure 8 : Bridge Deck (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 9 : Bridge Railing (Typ.)



Figure 10 : Bridge Railing-Evidence of Loose Connection

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 11 : Bridge Deck-Broken Plank



Figure 12 : Bridge Deck-Broken Plank

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 13 : Streambed Condition (Typ.)



Figure 14 : NE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 15 : NW Embankment



Figure 16 : SW Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 17 : SE Embankment



Figure 18 : Streambed-Evidence of Beaver Dam

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 19 : East Abutment Crib (Typ.)



Figure 20 : West Abutment Crib (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: Roger's Trail

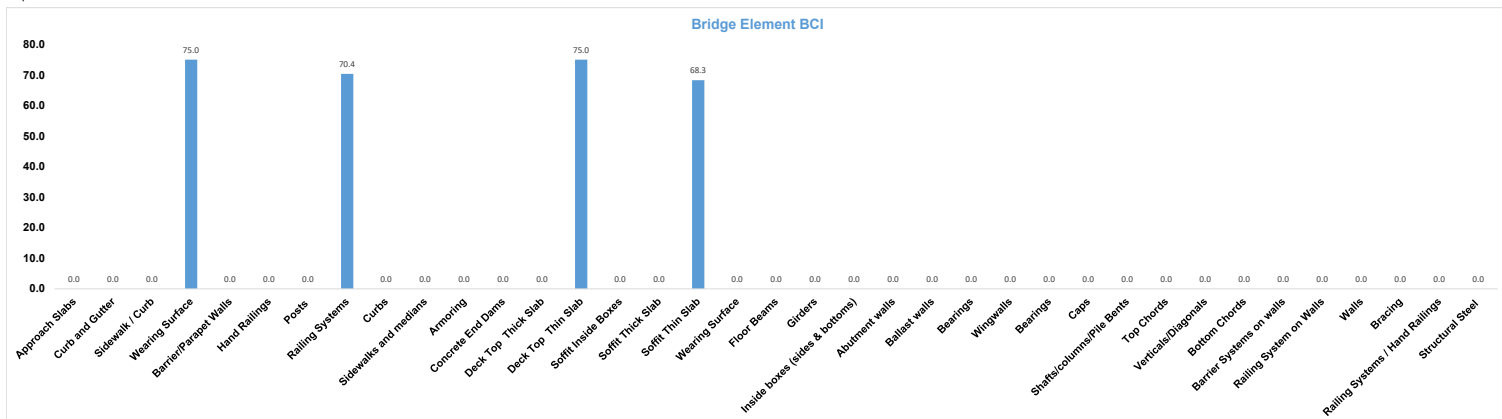
Structure Name: Stocking Hill Creek Pedestrian Bridge
Location: N/A



Figure 21 : Soffit (Typ.)

Structure Condition Summary Form		Bridge Condition Index (BCI): <u>71.1</u>	
Structure Name:	<u>Grasshopper Park Pedestrian Bridge</u>	I_t	<u> </u> Importance Factor for Traffic
Structure Number:	<u>14109</u>	I_c	<u> </u> Importance Factor for Economic Impact
Date of Inspection:	<u>November 13, 2024</u>	I_w	<u> </u> Importance Factor for Bridge Width
Assignment #:	<u>24079</u>	I_b	<u> </u> Importance Factor for Bridge Profile or Alignment
Consultant:	<u>TSI Inc.</u>	Bridge Sufficiency Index:	<u>71.1</u>

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: Grasshopper Park Pedestrian Bridge					
Main Hwy/Road #:	River Trail	Services on structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i>	<i>Ped.</i> ☒
	On structure ☒		<i>Rail</i>	<i>Road</i>	<i>Other</i>
	Under structure				
		Services under structure:	<i>Navig. Water</i>	<i>Non-Navig. Water</i> ☒	<i>Ped.</i>
			<i>Rail</i>	<i>Road</i>	<i>Other</i>
Structure Location:					
Latitude:	44.330666	Longitude:	-76.153366		
Owner/Custodian:	Town of Gananoque	Heritage	<i>Not Cons.</i>	<i>Cons./not App.</i>	<i>List/not Desig.</i>
		Designation:	<i>Desig./not List</i>	<i>Desig. & List</i>	
MTO Region:	Eastern Region	Hwy Class:	<i>Freeway</i>	<i>Arterial</i>	
			<i>Collector</i>	<i>Local</i> ☒	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Boardwalk	Interchange Number:			
Total Deck Length:	6.20 m	Interchange Structure Number:			
Overall Str. Width:	1.20 m	Min. Vertical Clearance: m			
Total Deck Area:	7.44 sq. m	Special Routes:	<i>Transit</i>	<i>Truck</i>	
Culvert Length:			<i>School</i>	<i>Bicycle</i>	
Roadway Width:		Detour Length Around Bridge: km			
Skew Angle:	Degrees	Traffic Directional Bound: East/West			
No. of Spans:	1.0	Fill on Structure: m			
Span Lengths:	6.20 m				

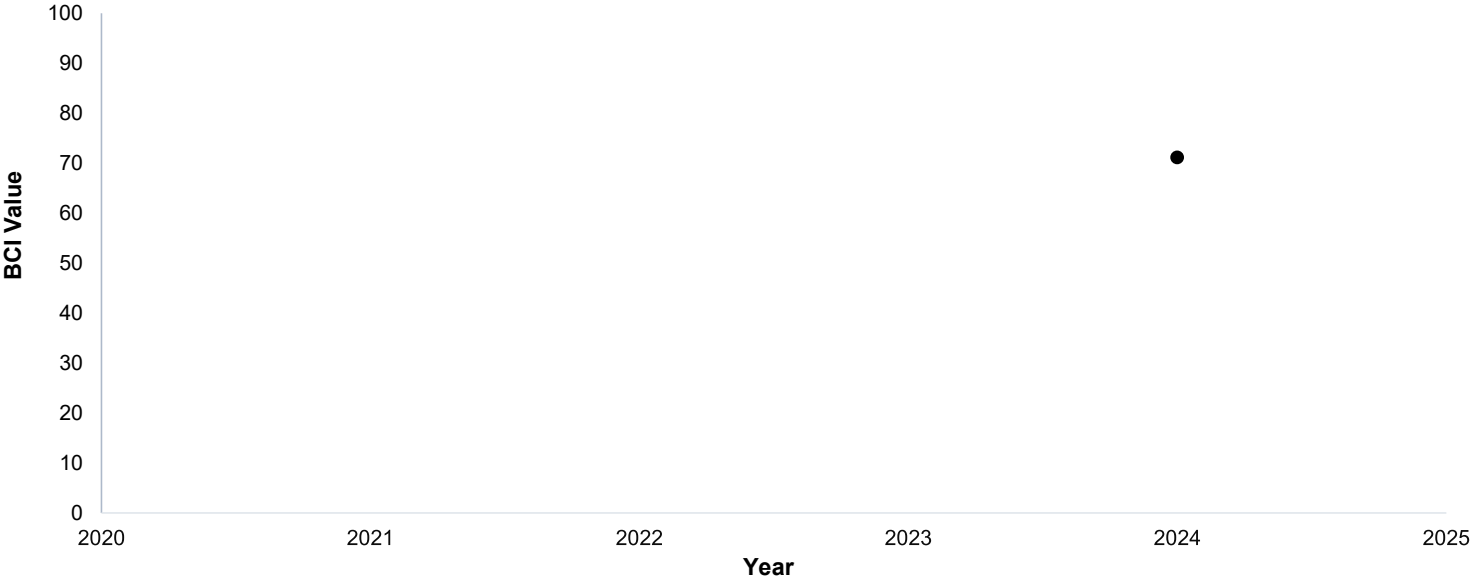
Historical Data:

Year Built:		Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:		Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Enhanced OSIM		2024	71.1		



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

Field Inspection Information:																																																																																				
Date of Inspection:	November 13, 2024	Type of Inspection:	☐ Reg. OSIM	☒ Enhanced OSIM																																																																																
Inspector:	Ramin Rameshni, PhD, P.Eng.																																																																																			
Others in Party:	Parisa Rameshni																																																																																			
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.																																																																																			
Weather:	Sunny																																																																																			
Temperature:	4 °C																																																																																			
Additional Investigations Required:		<table border="1"> <thead> <tr> <th colspan="3">Priority</th> </tr> <tr> <th>None</th> <th>Normal</th> <th>Urgent</th> </tr> </thead> <tbody> <tr> <td colspan="3">Material Condition Survey</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>Detailed Deck Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Non-Destructive Delamination Survey of Asphalt-Covered Deck:</td> <td>X</td> <td></td> </tr> <tr> <td>Concrete Substructure Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Detailed Coating Condition Survey:</td> <td>X</td> <td></td> </tr> <tr> <td>Detailed Timber Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Post-Tensioned Strand Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Underwater Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Fatigue Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Seismic Investigation:</td> <td>X</td> <td></td> </tr> <tr> <td>Structure Evaluation:</td> <td>X</td> <td></td> </tr> <tr> <td>Monitoring</td> <td></td> <td></td> </tr> <tr> <td>Monitoring of Deformations, Settlements and Movements:</td> <td>X</td> <td></td> </tr> <tr> <td>Monitoring of Crack Widths:</td> <td>X</td> <td></td> </tr> <tr> <td colspan="3">Investigation Notes:</td> </tr> <tr> <td colspan="3"></td> </tr> <tr> <td colspan="3">Overall Structure Notes:</td> </tr> <tr> <td>Recommended Work on Structure:</td> <td>☒ None</td> <td>☐ Minor Rehab.</td> <td>☐ Major Rehab.</td> <td>☐ Replace</td> </tr> <tr> <td>Timing of Recommended Work:</td> <td></td> <td>☐ 1 to 5 years</td> <td>☐ 6 to 10 years</td> <td></td> </tr> <tr> <td>Overall Comments:</td> <td colspan="4">Structure is generally in good condition. Evidence of localized severe rot on railing and weathering on soffit was noted. Maintenance need is recommended to remove heavy vegetation.</td> </tr> <tr> <td>Date of Next Inspection:</td> <td colspan="4">2026</td> </tr> </tbody></table>			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 of Crack Widths:	X		Investigation Notes:						Overall Structure Notes:			Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace	Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years		Overall Comments:	Structure is generally in good condition. Evidence of localized severe rot on railing and weathering on soffit was noted. Maintenance need is recommended to remove heavy vegetation.				Date of Next Inspection:	2026			
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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:	Decks	Length:	6.20				
Element Name:	Deck Top– Thin Slab	Width:	1.20				
Location:	Top of Structure	Height:					
Material:	Wood	Count (items):	1				
Element Type:	Exposed Wearing Surface	Total Quantity:	7.44 m ²				
Environment:	Severe	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m2		7.44			00	
Comments:	Generally in good condition.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Barriers	Length:	6.20				
Element Name:	Railing Systems	Width:					
Location:	North & South of Structure	Height:	0.95				
Material:	Wood	Count (items):	2				
Element Type:		Total Quantity:	12.40 m				
Environment:	Moderate	Limited Inspection:					
Protection System:	None						
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies	
	m		11.10	1.00	0.30	00	
Comments:	Evidence of localized severe rot was noted.						
Recommended Work:		Rehab		Replace	Maintenance Needs:		00
		1-5 years		6-10 years		Urgent	1 year

Element Group:	Embankments and Streams				Length:				
Element Name:	Embankments				Width:				
Location:	NE, NW, SE, SW				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:	• Evidence of heavy vegetation 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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:	• Evidence of heavy vegetation was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:		18		
		1-5 years		6-10 years		Urgent	1 year	2 years	
• To remove heavy vegetation.									

Element Group:	Decks	Length:	6.20					
Element Name:	Soffit– Thin Slab	Width:	1.20					
Location:	Below the deck	Height:						
Material:	Wood	Count (items):	1					
Element Type:		Total Quantity:	7.44 m ²					
Environment:	Moderate	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		6.24	1.00	0.20	00		
Comments:	• Evidence of weathering was noted.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Approaches	Length:	1.00					
Element Name:	Wearing Surface	Width:	1.20					
Location:	East & West	Height:						
Material:	Native	Count (items):	2					
Element Type:		Total Quantity:	2.40 m ²					
Environment:	Benign	Limited Inspection:						
Protection System:	None						Perform. Deficiencies	
Condition Data:	Units	Excellent	Good	Fair	Poor*			
	m2		2.40			00		
Comments:	• Generally in good condition.							
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 3 : Bridge Looking East



Figure 4 : Bridge Looking West

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 5 : Stream Looking North (U/S)-Evidence of Heavy Vegetation



Figure 6 : Stream Looking South (D/S)-Evidence of Heavy Vegetation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 7 : Deck Condition (Typ.)



Figure 8 : Railing (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 9 : Railing-Evidence of Severe Rot



Figure 10 : Railing Post Connection Detail (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 11 : Soffit (Typ.)



Figure 12 : End Detail (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 13 : West Approach



Figure 14 : East Approach-Evidence of Tripping Hazard

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 15 : SW Embankment



Figure 16 : SE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Grasshopper Park Pedestrian Bridge
Location: N/A



Figure 17 : NE Embankment



Figure 18 : NW Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Grasshopper Park Pedestrian Bridge

Hwy/Road Name: River Trail

Location: N/A



Figure 19 : Streambed Condition (Typ.)

Structure Name:	Arthur Street Pedestrian Bridge
Structure Number:	14110
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

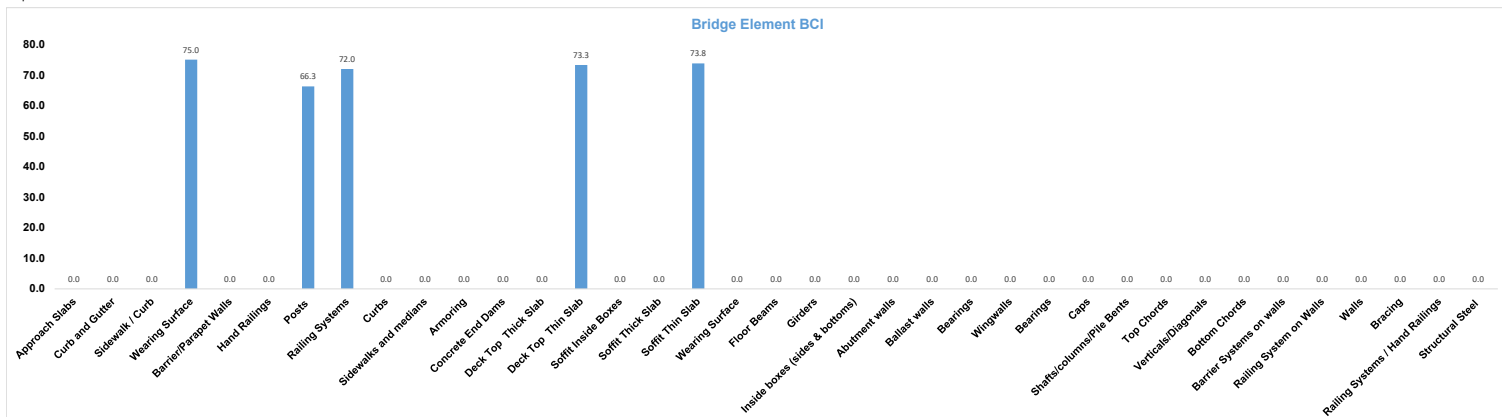
I_t	Importance Factor for Traffic
I_e	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index: 72.0

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
					(1.00)	(0.75)	(0.40)	(0.00)	(TRV)				
Approaches	Approach Slabs	Sq. m	140.0						0.0	0.0	0.0		
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	2.65		2.65	0.00		15.9	11.9	75.0		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	100.0	20.00		15.00	5.00		2000.0	1325.0	66.3		
	Railing Systems	m.	100.0	53.60		49.30	4.00	0.30	5360.0	3857.5	72.0		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	40.20		38.20	2.00	0.00	4824.0	3534.0	73.3		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	28.52		27.52	1.00	0.00	3422.4	2524.8	73.8		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	150.0						0.0	0.0	0.0		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0						0.0	0.0	0.0		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	15622.3	11253.2	72.0
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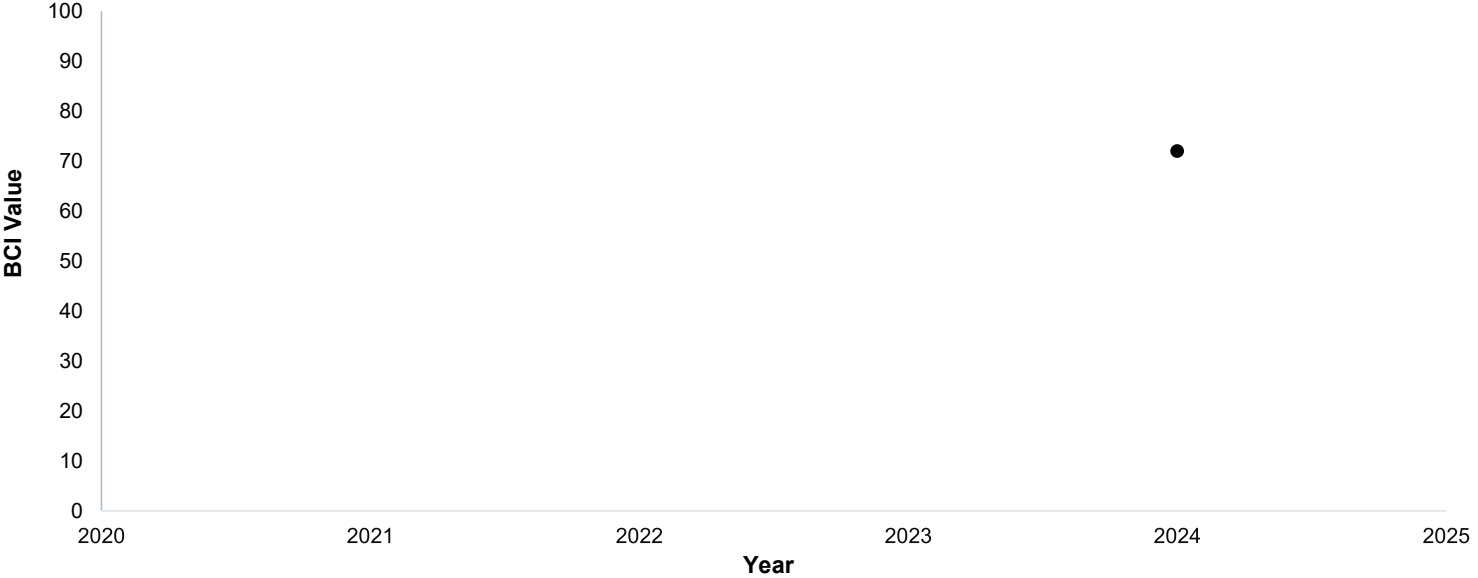
Structure Name:		Arthur Street Pedestrian Bridge									
Main Hwy/Road #:	River Trail		Services on structure:	Navig. Water		Non-Navig. Water		Ped.		Other	
	On structure	☒		Rail		Road		☐		☐	
	Under structure										
			Services under structure:	Navig. Water		Non-Navig. Water		Ped.		Other	
				Rail		Road		☒		☐	
Structure Location:											
Latitude:	44.3333			Longitude:	-76.147055						
Owner/Custodian:	Town of Gananoque			Heritage	Not Cons.		Cons./not App.		List/not Desig.		
				Designation:	Desig./not List		Desig. & List		☐		
MTO Region:	Eastern Region			Hwy Class:	Freeway		Arterial				
					Collector		Local				
MTO District:	Kingston			Posted Speed:			No. of Lanes:				
Old County:	Leeds and Grenville			AADT:			% Trucks:				
Township:	Leeds			Inspection Route Sequence:							
Structure Type:	Boardwalk			Interchange Number:							
Total Deck Length:	26.80		m	Interchange Structure Number:							
Overall Str. Width:	1.50		m	Min. Vertical Clearance:							
Total Deck Area:	40.20		sq. m	Special Routes:	Transit		Truck				
Culvert Length:			m		School		Bicycle				
Roadway Width:			m	Detour Length Around Bridge:				km			
Skew Angle:			Degrees	Traffic Directional Bound:		East/West					
No. of Spans:	10.0			Fill on Structure:				m			
Span Lengths:	2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4										

Year Built:		Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:		Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Enhanced OSIM		2024	72		



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

Field Inspection Information:					
Date of Inspection:	November 23, 2024	Type of Inspection:	☐ Reg. OSIM	☒ Enhanced OSIM	
Inspector:	Ramin Rameshni, PhD, P.Eng.				
Others in Party:	Parisa Rameshni				
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.				
Weather:	Cloudy				
Temperature:	7 °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 of Crack Widths:		X		
Investigation Notes:					
Overall Structure Notes:					
Recommended Work on Structure:	☒ None	☐ Minor Rehab.	☐ Major Rehab.	☐ Replace	
Timing of Recommended Work:		☐ 1 to 5 years	☐ 6 to 10 years		
Overall Comments:	Structure is generally in good condition. Evidence of rot was noted on railing.				
Date of Next Inspection:	2026				

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

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Maintenance Needs:

- 01 Lift and Swing Bridge Maintenance
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- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Works for Drainage System
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other Maintenance

Element Group:	Decks	Length:	26.80						
Element Name:	Deck Top– Thin Slab	Width:	1.50						
Location:	Top of Structure	Height:							
Material:	Wood	Count (items):	1						
Element Type:	Exposed Wearing Surface	Total Quantity:	40.20 m ²						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		38.20	2.00		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:	26.80						
Element Name:	Railing Systems	Width:							
Location:	North & South of Structure	Height:	1.10						
Material:	Wood	Count (items):	2						
Element Type:		Total Quantity:	53.60 m						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m		49.30	4.00	0.30	00			
Comments:	• Evidence of rot 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:	Embankments				Width:				
Location:	NE, NW, SE, SW				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent		1 year	2 years

Element Group:	Decks	Length:	24.80						
Element Name:	Soffit– Thin Slab	Width:	1.15						
Location:	Below the deck	Height:							
Material:	Wood	Count (items):	1						
Element Type:		Total Quantity:	28.52 m ²						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		27.52	1.00		00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent	1 year	2 years	

Element Group:	Approaches	Length:	1.00						
Element Name:	Wearing Surface	Width:	E (1.15), W (1.5)						
Location:	East & West	Height:							
Material:	Native	Count (items):	2						
Element Type:		Total Quantity:	2.65 m ²						
Environment:	Benign	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		2.65			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:							
Element Name:	Posts	Width:							
Location:	North & South	Height:							
Material:	Wood	Count (items):		20					
Element Type:		Total Quantity:		20.00		Each			
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		15.00	5.00		00			
Comments:	• Evidence of rot on railing post and foundation was noted.								
Recommended Work:		Rehab		Replace	Maintenance Needs:			00	
		1-5 years		6-10 years		Urgent		1 year	2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
 Hwy/Road Name: River Trail

Structure Name: Arthur Street Pedestrian Bridge
 Location: N/A



Figure 1 : North Elevation



Figure 2 : South Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Arthur Street Pedestrian Bridge
Location: N/A



Figure 3 : East Approach



Figure 4 : West Approach & Staircase

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Arthur Street Pedestrian Bridge

Hwy/Road Name: River Trail

Location: N/A



Figure 5 : Stream Looking North (D/S)



Figure 6 : Stream Looking South (U/S)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Arthur Street Pedestrian Bridge
Location: N/A



Figure 7 : Deck (Typ.)



Figure 8 : NE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Arthur Street Pedestrian Bridge

Hwy/Road Name: River Trail

Location: N/A



Figure 9 : NW Embankment



Figure 10 : Streambed Condition

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque

Structure Name: Arthur Street Pedestrian Bridge

Hwy/Road Name: River Trail

Location: N/A



Figure 11 : SW Embankment



Figure 12 : SE Embankment

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Arthur Street Pedestrian Bridge
Location: N/A



Figure 13 : East Steps



Figure 14 : Railing (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: Arthur Street Pedestrian Bridge
Location: N/A



Figure 15 : Railing Post & Foundation (Typ.)



Figure 16 : Soffit (Typ.)

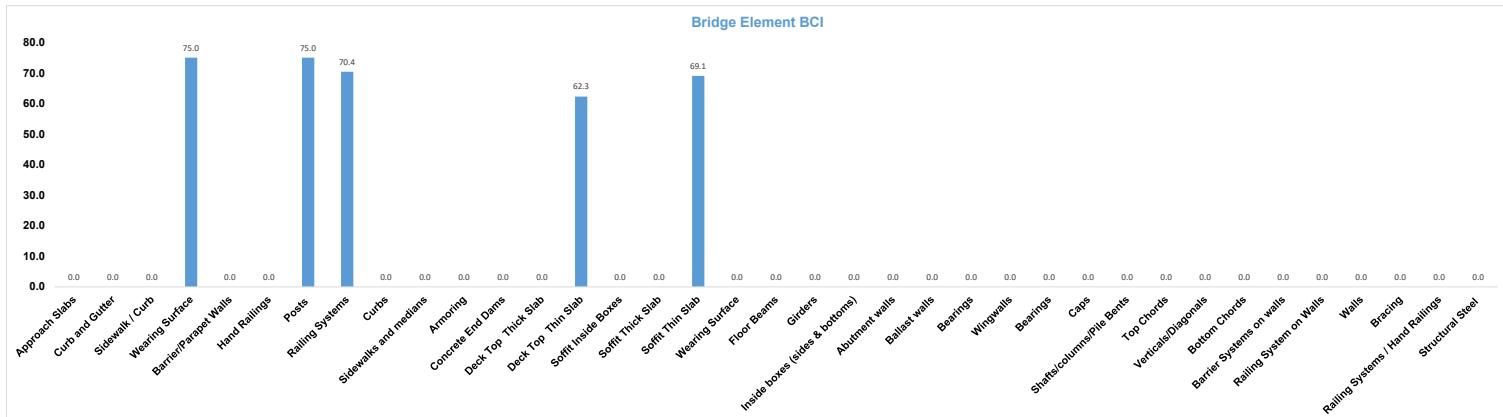
Structure Condition Summary Form	
Structure Name:	McLean Forest Pedestrian Bridge
Structure Number:	14111
Date of Inspection:	November 23, 2024
Assignment #:	24079
Consultant:	TSI Inc.

Bridge Condition Index (BCI):	68.0
I_t	Importance Factor for Traffic
I_c	Importance Factor for Economic Impact
I_w	Importance Factor for Bridge Width
I_p	Importance Factor for Bridge Profile or Alignment
Bridge Sufficiency Index:	68.0

Element Group	Element Name	Unit	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition	Element Qty. in Good Condition	Element Qty. in Fair Condition	Element Qty. in Poor Condition	Total Replacement Value	Current Element Value (CEV)	Element Condition Index (ECI)	Performance Deficiency	Maintenance Need
Approaches	Approach Slabs	Sq. m	140.0		(1.00)	(0.75)	(0.40)	(0.00)	(TRV)	0.0	0.0	0.0	
	Curb and Gutter	Sq. m	25.0						0.0	0.0	0.0		
	Sidewalk / Curb	Sq.m.	60.0						0.0	0.0	0.0		
	Wearing Surface	Sq. m	6.0	3.10		3.10	0.00		18.6	14.0	75.0		
Barriers	Barrier/Parapet Walls	Sq. m	100.0						0.0	0.0	0.0		
	Hand Railings	m.	100.0						0.0	0.0	0.0		
	Posts	Ea.	100.0	6.00		6.00	0.00		600.0	450.0	75.0		
	Railing Systems	m.	100.0	7.60		6.60	1.00	0.00	760.0	535.0	70.4		
Sidewalks / Curbs	Curbs	Sq. m	40.0						0.0	0.0	0.0		
	Sidewalks and medians	Sq. m	150.0						0.0	0.0	0.0		
Joints	Armoring	m.	1.0						0.0	0.0	0.0		
	Concrete End Dams	Sq. m	2,100.0						0.0	0.0	0.0		
Decks	Deck Top Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Deck Top Thin Slab	Sq. m	120.0	10.23		7.43	2.00	0.80	1227.6	764.7	62.3		
	Soffit Inside Boxes	Sq. m	120.0						0.0	0.0	0.0		
	Soffit Thick Slab	Sq. m	350.0						0.0	0.0	0.0		
	Soffit Thin Slab	Sq. m	120.0	5.89		4.89	1.00	0.00	706.8	488.1	69.1		
	Wearing Surface	Sq. m	25.0						0.0	0.0	0.0		
Beams / Main Longitudinal Elements	Floor Beams	Sq. m	200.0						0.0	0.0	0.0		
	Girders	Sq. m	150.0						0.0	0.0	0.0		
	Inside boxes (sides & bottoms)	Sq. m	200.0						0.0	0.0	0.0		
Abutments	Abutment walls	Sq. m	900.0						0.0	0.0	0.0		
	Ballast walls	Sq. m	350.0						0.0	0.0	0.0		
	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Wingwalls	Sq. m	350.0						0.0	0.0	0.0		
Piers	Bearings	Ea.	1,000.0						0.0	0.0	0.0		
	Caps	Sq. m	900.0						0.0	0.0	0.0		
	Shafts/columns/Pile Bents	Sq. m	900.0						0.0	0.0	0.0		
Trusses/Arches	Top Chords	Sq. m	300.0						0.0	0.0	0.0		
	Verticals/Diagonals	Sq. m	300.0						0.0	0.0	0.0		
	Bottom Chords	Sq. m	300.0						0.0	0.0	0.0		
Retaining Walls	Barrier Systems on walls	Sq. m	200.0						0.0	0.0	0.0		
	Railing System on Walls	m	200.0						0.0	0.0	0.0		
	Walls	Sq. m	350.0						0.0	0.0	0.0		
Bracing	Bracing	Ea.	500.0						0.0	0.0	0.0		
Coating	Railing Systems / Hand Railings	m	125.0						0.0	0.0	0.0		
	Structural Steel	Sq. m	80.0						0.0	0.0	0.0		

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.

Total:	3313.0	2251.8	68.0
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Inventory Data:

Structure Name: McLean Forest Pedestrian Bridge					
Main Hwy/Road #:	River Trail	Services on structure:	Navig. Water	Non-Navig. Water	Ped. ☒
	On structure ☒		Rail	Road	Other
	Under structure				
		Services under structure:	Navig. Water	Non-Navig. Water ☒	Ped.
			Rail	Road	Other
Structure Location:					
Latitude:	44.33407	Longitude:	-76.14562		
Owner/Custodian:	Town of Gananoque	Heritage	Not Cons.	Cons./not App.	List/not Desig.
		Designation:	Desig./not List	Desig. & List	
MTO Region:	Eastern Region	Hwy Class:	Freeway	Arterial	
			Collector	Local	
MTO District:	Kingston	Posted Speed:		No. of Lanes:	
Old County:	Leeds and Grenville	AADT:		% Trucks:	
Township:	Leeds	Inspection Route Sequence:			
Structure Type:	Boardwalk	Interchange Number:			
Total Deck Length:	3.80 m	Interchange Structure Number:			
Overall Str. Width:	1.55 m	Min. Vertical Clearance:	m		
Total Deck Area:	5.89 sq. m	Special Routes:	Transit	Truck	
			School	Bicycle	
Culvert Length:	m	Detour Length Around Bridge:	km		
Roadway Width:	m	Traffic Directional Bound:	North/South		
Skew Angle:	Degrees	Fill on Structure:	m		
No. of Spans:	2.0				
Span Lengths:	1.75, 1.75 m				

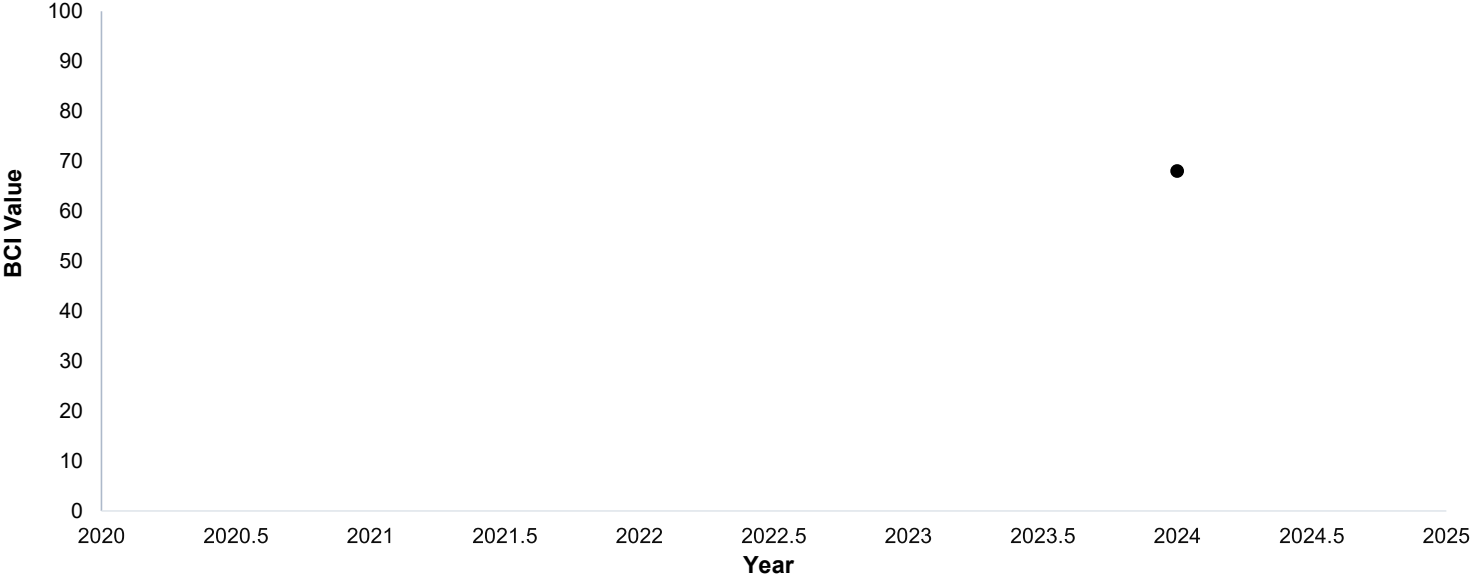
Historical Data:

Year Built:		Year of Last Major Rehabilitation:	
Last Regular OSIM Inspection:		Year of Last Minor Rehabilitation:	
Last Enhanced OSIM Inspection:		Year of Last Bridge Evaluation:	
Enhanced Access Equipment (ladder, boat, lift, etc.):		Current Load Limit:	tons
Last Underwater Inspection:		Load Limit By-Law #:	
Last Condition Survey:		By-Law Expiry Date:	

Rehabilitation History: (Date / Description):

Work History:				
Year	Contract	WP Number	Category	Comments

Investigation History:					
Type	BM Used	Date	BCI	Special Notes	BCI Justification
Enhanced OSIM		2024	68		



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

Field Inspection Information:				
Date of Inspection:	November 23, 2024	Type of Inspection:	☐ Reg. OSIM	☒ Enhanced OSIM
Inspector:	Ramin Rameshni, PhD, P.Eng.			
Others in Party:	Parisa Rameshni			
Equipment Used:	Digital camera, chipping hammer, chain, measuring tape, caliper, chalk, marker, flashlight, chest waders, and other equipment as required.			
Weather:	Cloudy			
Temperature:	7 °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 of Crack Widths:	X		
Investigation Notes:				
Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☒ Minor Rehab.	☐ Major Rehab.	☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years	☒ 6 to 10 years		
Overall Comments:	Structure is generally in good condition. Evidence of broken timber & localized failure of ramp ribs was noted. Minor rehab is recommended to repair broken timber of ramp.			
Date of Next Inspection:	2026			

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:	Decks	Length:	1.4+3.8+1.4						
Element Name:	Deck Top– Thin Slab	Width:	1.55						
Location:	Top of Structure	Height:							
Material:	Wood	Count (items):	1						
Element Type:	Exposed Wearing Surface	Total Quantity:	10.23 m ²						
Environment:	Severe	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m2		7.43	2.00	0.80	00			
Comments:	• Generally in good condition. • Evidence of broken timber & localized failure of ramp ribs was noted.								
Recommended Work:	☒	Rehab		Replace	Maintenance Needs:		00		
		1-5 years	☒	6-10 years		Urgent	1 year	2 years	
• To repair broken timber of ramp.									

Element Group:	Barriers	Length:	3.80						
Element Name:	Railing Systems	Width:							
Location:	East & West of Structure	Height:	1.10						
Material:	Wood	Count (items):	2						
Element Type:		Total Quantity:	7.60 m						
Environment:	Moderate	Limited Inspection:							
Protection System:	None						Perform. Deficiencies		
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	m		6.60	1.00		00			
Comments:									
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				Height:				
Material:					Count (items):	4			
Element Type:					Total Quantity:	4.00 Each			
Environment:					Limited Inspection:				
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		4.00				00		
Comments:									
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 the structure				Height:				
Material:	Native				Count (items):				
Element Type:					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:									
Recommended Work:		Rehab		Replace	Maintenance Needs:		00		
		1-5 years		6-10 years		Urgent		1 year	2 years

Element Group:	Decks	Length:	3.80					
Element Name:	Soffit– Thin Slab	Width:	1.55					
Location:	Below the deck	Height:						
Material:	Wood	Count (items):	1					
Element Type:		Total Quantity:	5.89 m ²					
Environment:	Moderate	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		4.89	1.00		00		
Comments:								
Recommended Work:		Rehab		Replace	Maintenance Needs:		00	
		1-5 years		6-10 years		Urgent	1 year	2 years

Element Group:	Approaches	Length:	1.00					
Element Name:	Wearing Surface	Width:	1.55					
Location:	North & South	Height:						
Material:	Native	Count (items):	2					
Element Type:		Total Quantity:	3.10 m ²					
Environment:	Benign	Limited Inspection:						
Protection System:	None							
Condition Data:	Units	Excellent	Good	Fair	Poor*	Perform. Deficiencies		
	m2		3.10			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:					
Element Name:	Posts			Width:					
Location:	East & West			Height:					
Material:	Wood			Count (items):		6			
Element Type:				Total Quantity:		6.00		Each	
Environment:	Moderate			Limited Inspection:					
Protection System:	None					Perform. Deficiencies			
Condition Data:	Units	Excellent	Good	Fair	Poor*				
	Each		6.00			00			
Comments:									
Recommended Work:		Rehab		Replace	Maintenance Needs:			00	
		1-5 years		6-10 years		Urgent		1 year	2 years

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: McLean Forest Pedestrian Bridge
Location: N/A



Figure 1 : East Elevation



Figure 2 : West Elevation

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: McLean Forest Pedestrian Bridge
Location: N/A



Figure 3 : North Approach



Figure 4 : South Approach

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: McLean Forest Pedestrian Bridge
Location: N/A



Figure 5 : South Ramp-Evidence of Broken Timber & Localized Failure of Ramp Ribs



Figure 6 : Bridge Deck (Typ.)

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: McLean Forest Pedestrian Bridge
Location: N/A



Figure 7 : East Railing



Figure 8 : West Railing

REPRESENTATIVE PHOTOGRAPHS

Owner: Town of Gananoque
Hwy/Road Name: River Trail

Structure Name: McLean Forest Pedestrian Bridge
Location: N/A



Figure 9 : North Ramp



Figure 10 : Soffit (Typ.)