



# Pavement Management System & Bridge Appraisal Status Report

Operations Committee

May 2025

# Pavement / Bridge Management Systems

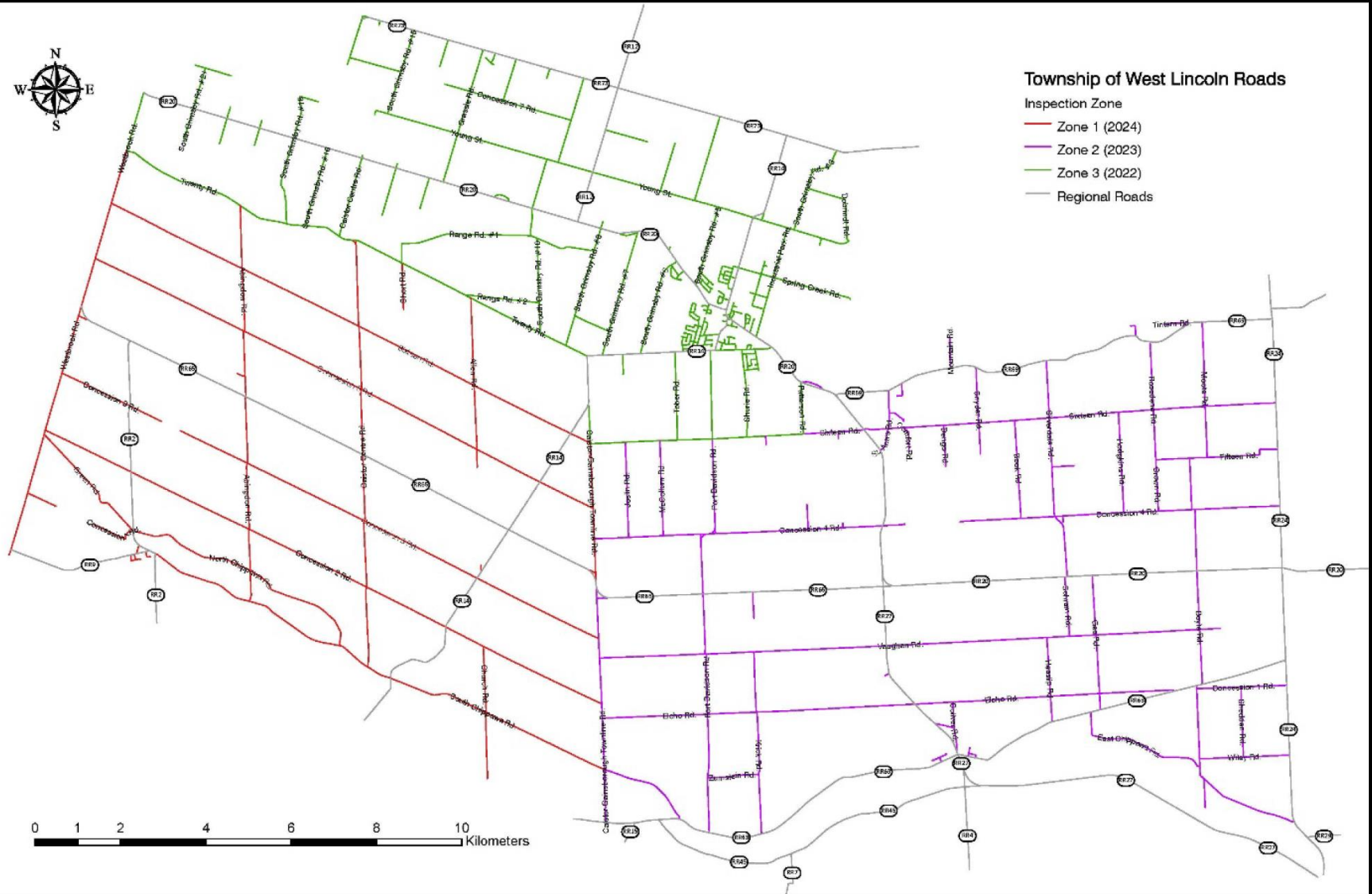
- Overview Pavement Management System
- Overview Bridge Management System

## Pavements

- Current Network Condition
- Sustainable Funding to Maintain Pavements in Optimal Condition

## Bridge & Major Culverts

- Current Condition
- Rehabilitation / Replacement Needs
- Sustainable Funding to Maintain Bridges in Optimal Condition



387 (+ 98 – granular roads) road elements (varying in distance) comprising some 276 (+ 111 – granular roads) centreline km's of roadway.

Network

Section

Surface Defects | Associated Feature Conditions

Surface



Surface



Single



Transverse Half, Full and Multiple Cracking

Alligator Cracking



Longitudinal Wheel Track Alligator Cracking



Centreline Alligator Cracking



Pavement Edge Alligator Cracking



Transverse Alligator Cracking

Others



Meander and Midlane Cracking



Map Cracking



Recalc all PCI...

Rating

RCR



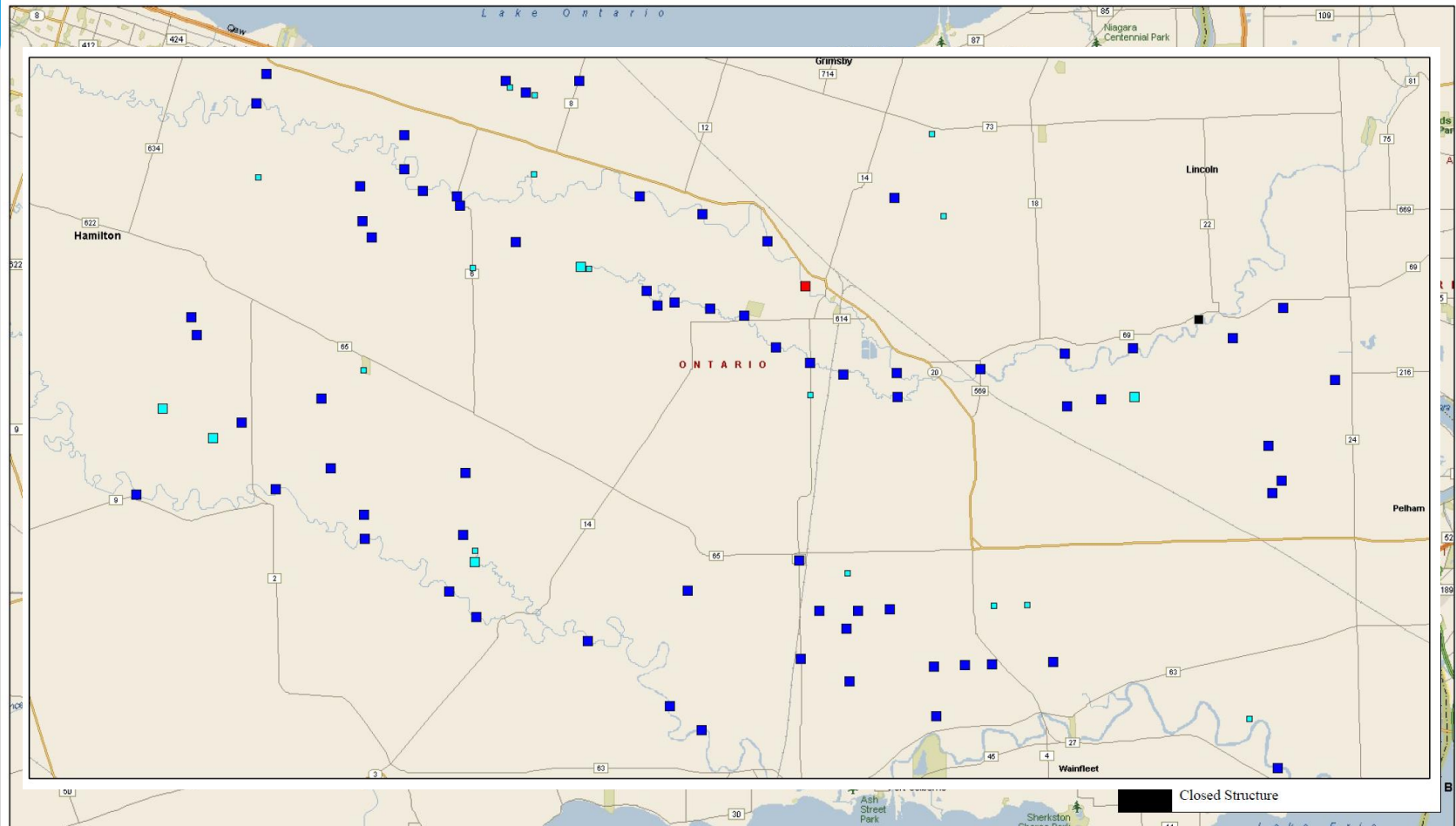
PCI

<-- Hint

Inspected by

Comments

# Overview of Bridge Network & Bridge Management System



- 91 Structures ( Replacement Value of \$96 Million)
- 72 Bridges & 19 Major Culverts

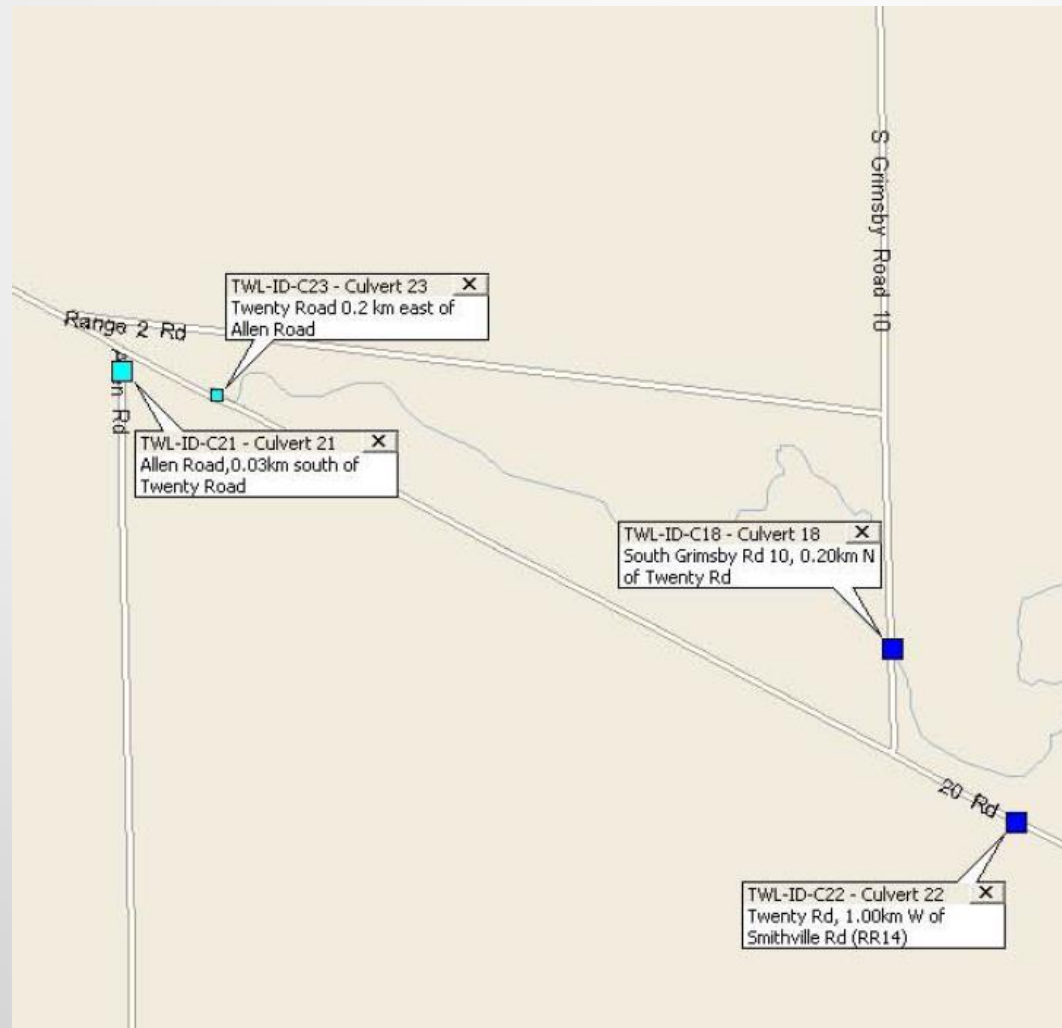
## NOTE:

*Bridge = Box or open type structure with span 3.0m and greater with less than 0.6m of cover.*

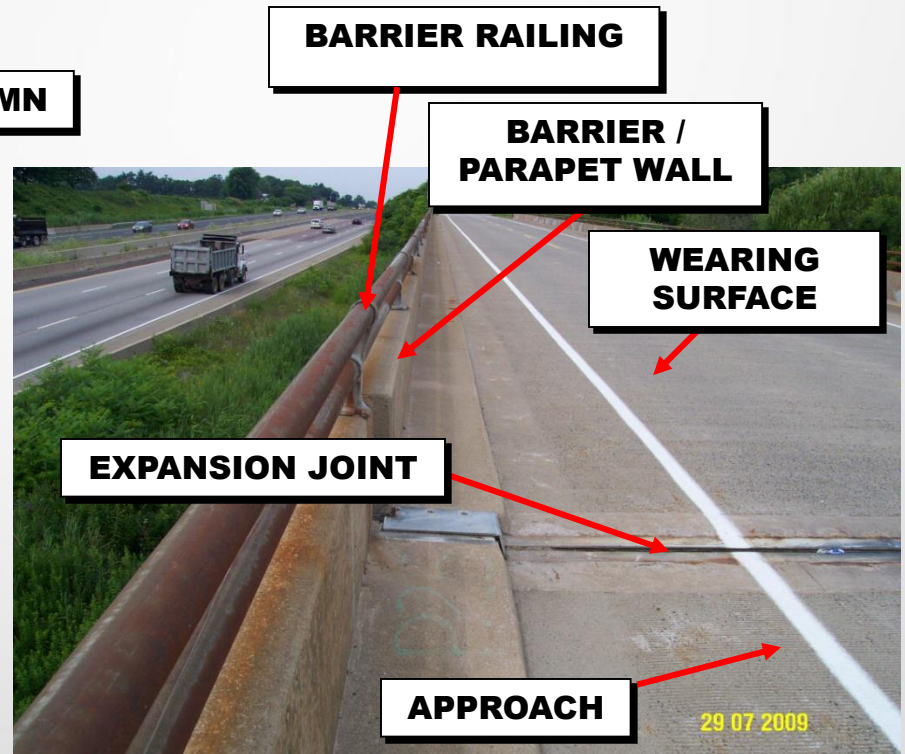
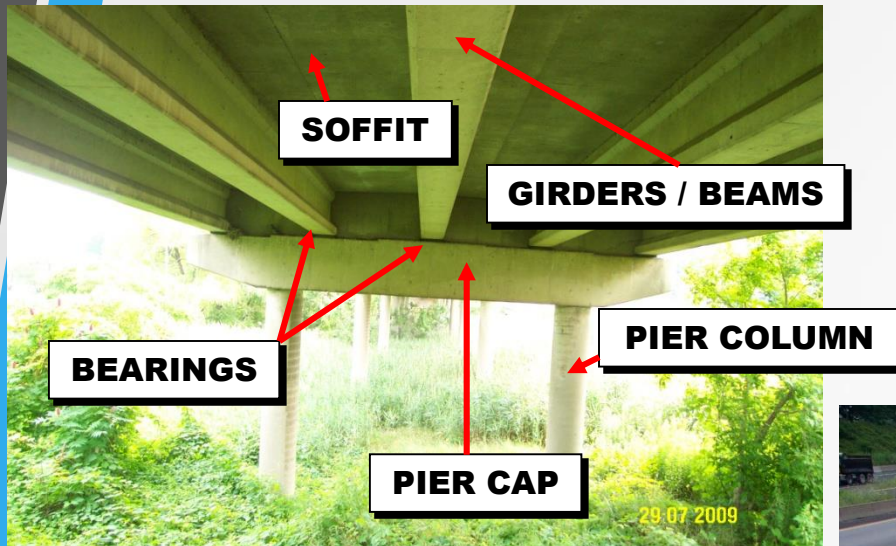
*Culvert = Greater than 0.6m of cover. Also includes corrugated steel pipe (CSP), soil steel multi plate (SSMP), corrugated plastic pipe (CPP), concrete pipe (CP).*



All Township Structures are identified using "Structure ID's"



## Elements of a Bridge





## Township of West Lincoln

### 2023 Structure Inspection Program - Rehabilitation/Replacement Needs

<b>Structure Name</b>	Campbell Bridge	<b>ID Number</b>	TWL-ID-B04
<b>Classification</b>	<input checked="" type="checkbox"/> Bridge <input checked="" type="checkbox"/> Structure <input type="checkbox"/> Culvert <input type="checkbox"/> Municipal	<b>Previous ID Number</b>	N/A
<b>Type of Location</b>	<input checked="" type="checkbox"/> Roadway <input type="checkbox"/> Driveway <input type="checkbox"/> Other	<b>Number of Spans</b>	1
<b>Location</b>	South Grimsby Road 16, 0.10km north of Twenty Road	<b>Span Lengths (m)</b>	16.7
<b>Structure Type</b>	RF	<b>Deck Area (m<sup>2</sup>)</b>	159
<b>Yr Constructed</b>	1962	<b>Load Posting</b>	No Posting
<b>Yr Rehabilitated</b>	N/A	<b>Current AADT</b>	75
<b>Inspection Date</b>	03-Nov-23	<b>Date AADT</b>	
<b>Previous Inspection</b>	26-Apr-21	<b>Board Order/ Agreement</b>	<input type="checkbox"/>
<b>Next Inspection</b>	2025	<b>Drone Inspection</b>	<input type="checkbox"/>

#### Effects of Deterioration

The north approach roadway is gravel and is in fair condition with settlement and light settlement and medium potholes at the extent of the structure. The asphalt paved roadway over the structure is in good condition. There are steel beam guiderails at all four corners of the structure with extruders at the north ends and roundings at the south ends, which are in good condition. The steel barrier railings and posts over the structure are in fair to poor condition with areas of medium surface corrosion throughout. The coating system on the railings has failed. The concrete curbs are generally in good condition with isolated wide cracks. Short sections of concrete barrier wall have been added at the four corners of the structure to connect the steel beam guiderails. The concrete barriers are in good condition.

The bridge deck soffit is generally in good condition. There is narrow to medium width vertical cracking with efflorescent staining along the centre of the soffit extending to the abutment sidewalls. The 2022 condition survey noted delamination in the soffit along the centreline and at the deck drain locations. The deck drains appear to be cored through the bridge deck. There is water staining on the bridge deck soffit at all four deck drains. The concrete abutments are generally in good condition with light scour at the waterline and isolated narrow vertical cracks. The concrete wingwalls are generally in good condition. There is light erosion at all four corners.

#### Recommendation

Following the results of the 2022 condition survey, we recommend rehabilitating the structure NOW. The rehabilitation work includes the following: concrete patch repairs, waterproofing and paving the bridge deck, replace steel barrier railings and posts with concrete parapet walls, and replacing the deck drains.

<b>General Overall Condition</b>	Good	<b>Priority Rating</b>	NOW	<b>Current BCI</b>	74
<b>Estimated Total Cost</b>	\$517,500.00	<b>Implementation Ranking</b>	Medium	<b>Previous BCI</b>	75

## Example of a Bridge Inspection Report

## Township of West Lincoln

### 2023 Structure Inspection Program - Rehabilitation/Replacement Needs

<b>Structure Name</b>	Campbell Bridge	<b>ID Number</b>	TWL-ID-B04
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#### Recommended Rehabilitation

RSP - Rehabilitate Superstructure  
RSB - Rehabilitate Substructure  
RIR - Railing Improvement/Replacement  
PWP - Patch Waterproof and Pave

MIS - Miscellaneous - Other Work

Replace Deck Drains

#### Engineering Cost

Engineering - PWP, RIR, RSB, RSP, MIS	\$67,500.00
	\$0.00
<b>Sub Total</b>	<b>\$67,500.00</b>

#### Construction Cost

Replace Railings and Posts - RIR	\$100,000.00
Replace Deck Drains - MIS	\$25,000.00
Patch, Waterproof, Pave - PWP	\$250,000.00
Concrete Patch Repairs - RSB, RSP	\$75,000.00
	\$0.00
<b>Sub Total</b>	<b>\$450,000.00</b>
<b>Total</b>	<b>\$517,500.00</b>

**Inspected By** Darryl Bakker, P.Eng. and Emma Stephenson of ELLIS Engineering Inc.

**Photos** 0342-0475

**Measurements** Span = 16.7m  
Width = 9.5m

**Additional Notes** Previous Structure Name: South Grimsby Con 9 Lot 32/33, "Campbell Bridge"

Maintenance/Rehabilitation Work:  
c.2000: SBGR and concrete barrier installed.

**Access Requirements** None.

Campbell Bridge  
TWL-ID-B04



Photograph No. 1: 0362: Roadway over the structure looking south.



Photograph No. 2: 0433: East elevation.

Campbell Bridge  
TWL-ID-B04



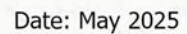
Photograph No. 3: 0442: Underside of the structure looking south.



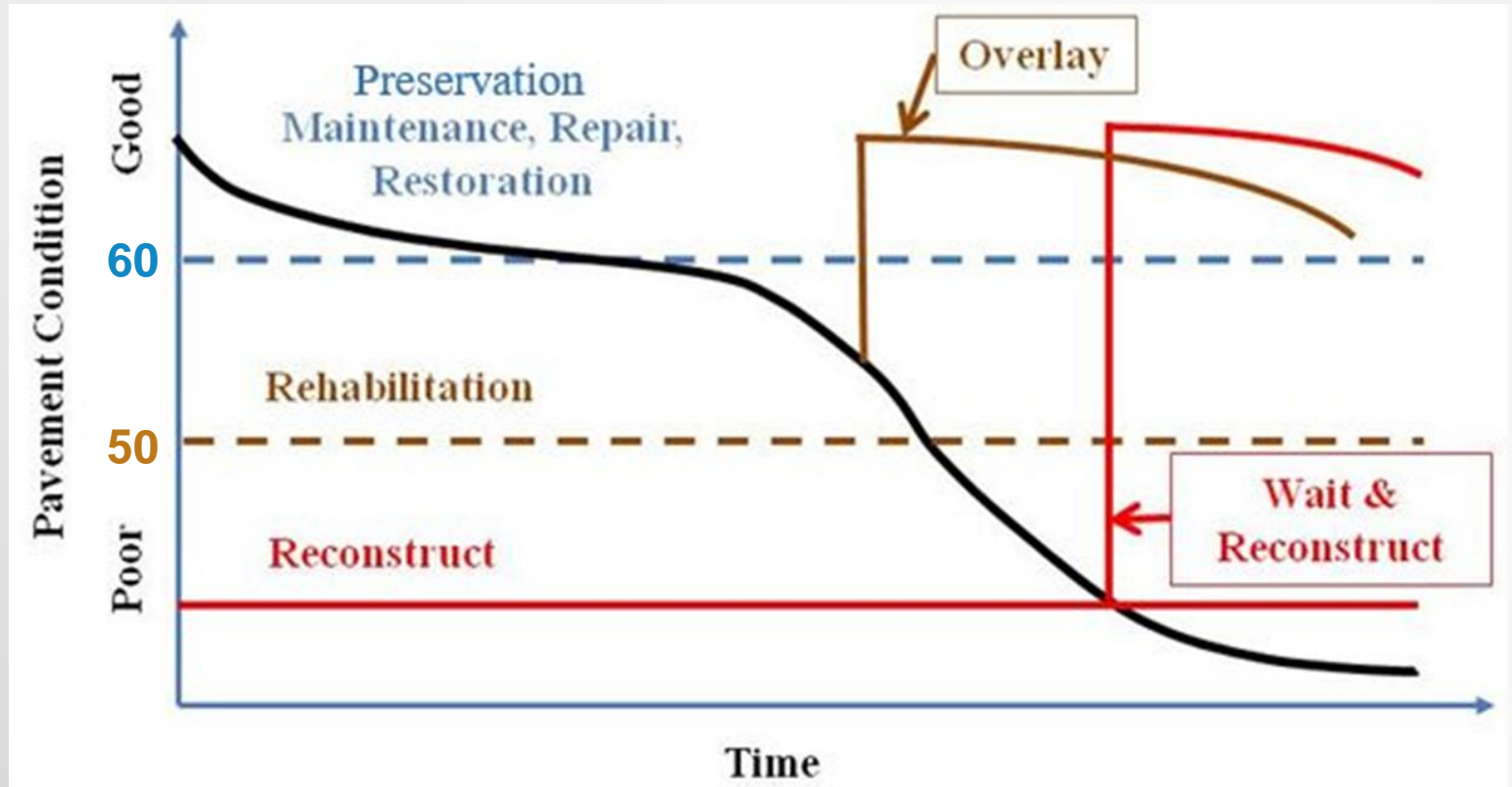
Photograph No. 4: 0418: Corrosion in railing (typ).



### Distribution of Pavement Condition Index for Road Network (based on area)



# Pavement Network - Current Condition



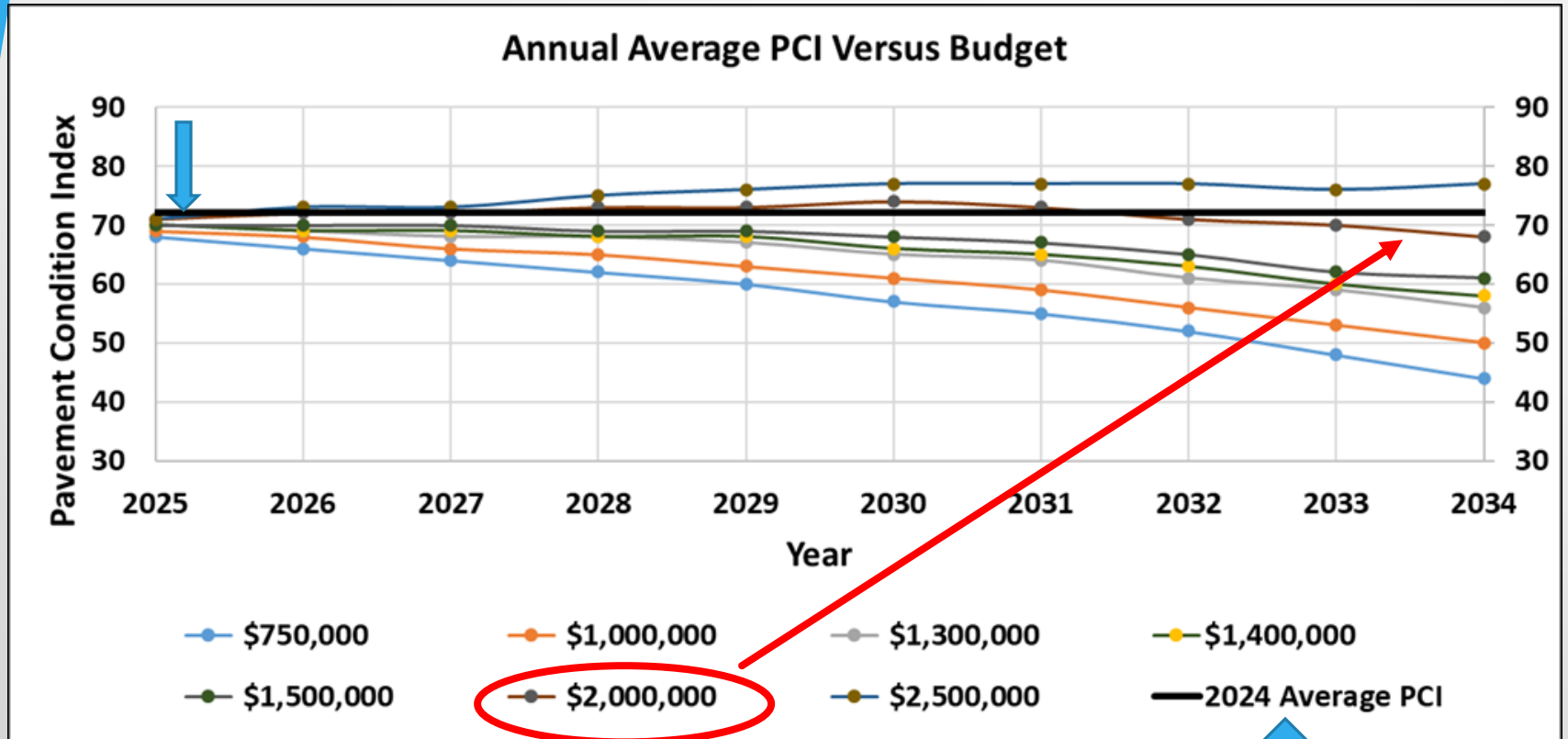
- Roadways with a condition rating  $<50$  are typically programmed for major rehabilitation or reconstruction. (For both LCB & HCB Pavements)
- LCB - Roadways with a FAIR condition (PCI 50-60) are programmed for resurfacing & GOOD condition (PCI 61-75) are typically programmed for preventative maintenance
- HCB – Roadways with a GOOD condition (PCI 60 +/-) are programmed for resurfacing

# Summary of Reconstruction & Resurfacing Needs Based on UNLIMITED BUDGET

Year	Major Rehab / Reconstruction	Resurfacing	Total	PCI
2025	7,015,828	5,992,259	13,008,087	80
2026	2,919,515	2,620,828	5,540,343	84
2027	2,667,368	3,378,261	6,045,629	89
2028	384,030	3,294,865	3,678,896	92
2029	-	1,594,303	1,594,303	93
2030	186,480	992,188	1,178,668	93
2031	-	379,338	379,338	92
2032	388,080	98,160	486,240	90
2033	-	81,360	81,360	88
2034	208,530	328,049	536,579	87
<b>Total</b>	<b>\$ 13,769,831</b>	<b>\$ 18,759,611</b>	<b>\$ 32,529,442</b>	



# Future Road Network Condition



Average Pavement Condition Index for Various Funding Scenarios

# Sustainable Funding Amount - Pavements

## Budget Forecast Summary

\$2.5

100

Year	Major Rehab. (\$)	Resurfacing (\$)	Yearly Total (\$)	Network PCI
2025	316,080	1,638,974	1,955,054	71
2026	-	1,980,285	1,980,285	72
2027	-	1,958,848	1,958,848	72
2028	-	1,983,123	1,983,123	73
2029	-	1,767,507	1,767,507	73
2030	-	1,979,593	1,979,593	74
2031	913,590	1,084,396	1,997,986	73
2032	1,942,177	-	1,942,177	71
2033	1,826,127	148,908	1,975,035	70
2034	1,067,401	639,680	1,707,081	68
<b>Total</b>	<b>\$ 6,065,376</b>	<b>\$ 13,181,313</b>	<b>\$ 19,246,689</b>	

■ Major Rehab. ■ Resurfacing ■ PCI

- The Optimal resurfacing and reconstruction budget to maintain our PCI condition is \$2 million / year. This funding would be split between resurfacing & reconstruction as needed.

## Bridge Network – Current Condition

The “2023 Municipal Bridge Appraisals” and BMS indicate the following:

- 46% of structures are considered “very good”
  - (do not require any work in the next 10 years)
- 11% of structures are considered to be in “good” condition
  - (requiring only maintenance work);
- 21% are in “fair” condition
  - (requiring minor rehabilitation and repair work within the next 10 years);
- 18% are in “poor” condition
  - (requiring major rehabilitation or replacement within the next 10 years).

# Bridge Rehabilitation / Replacement Needs

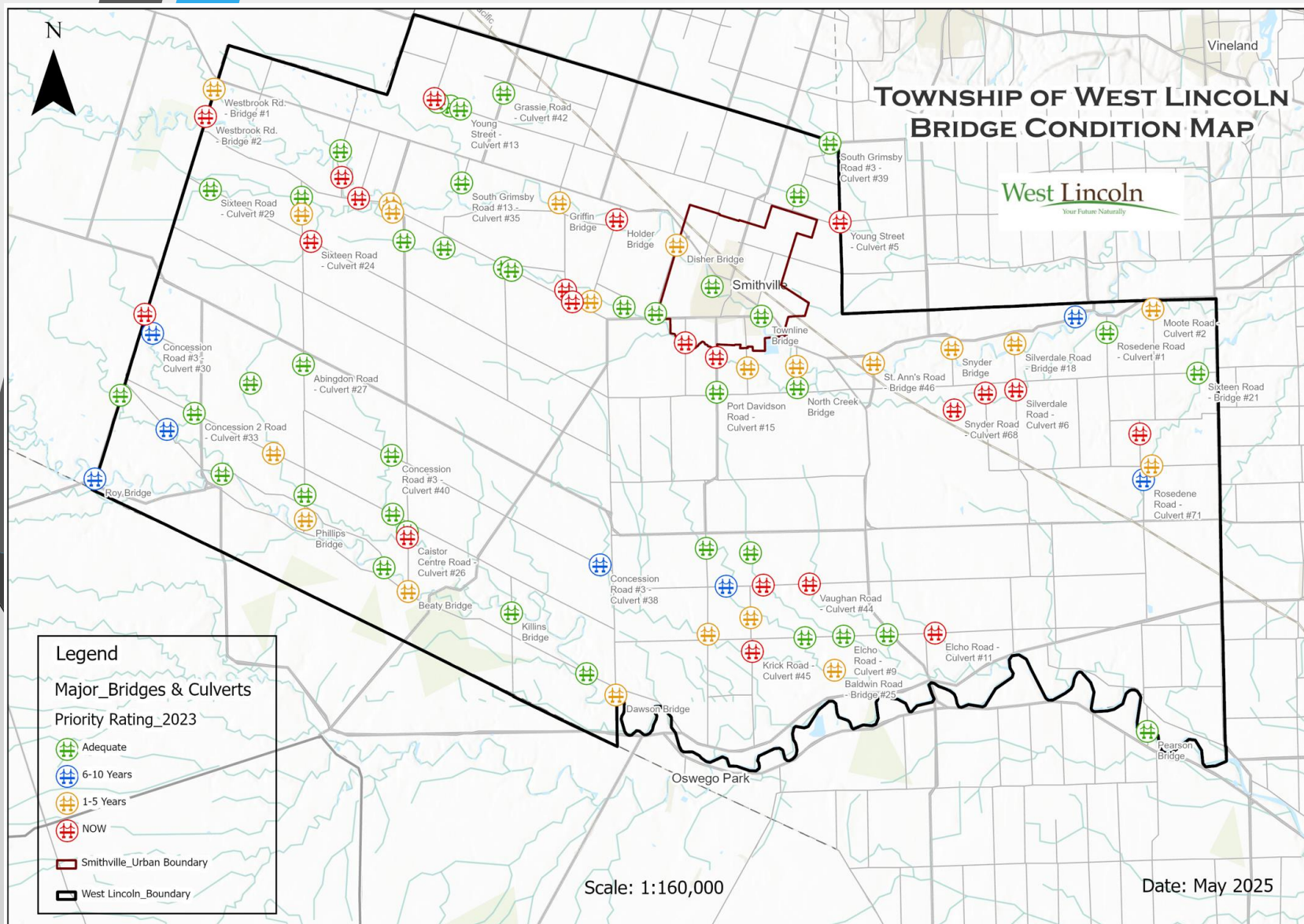
The biannual inspections and BMS prioritizes the maintenance, rehab / replacement needs in the following categories:

- NOW Needs
- 1 to 5 Year Needs
- 6 to 10 Year Needs
- Adequate

The table below summarizes our funding needs based on the 2023 Inspections:

	NOW Needs	1-5 YR Needs	6-10 YR Needs	TOTAL Needs
Total	\$2.9 M	\$9.4 M	\$4.0 M	\$16.3 M

- The total needs for the 10 year forecast amounts to \$16.3 million which translates to \$1.63 million per year.
- The Township's 2025 Capital Budget Forecast has an average of \$800,000 per year allocated.





# SUMMARY – SUSTAINABLE FUNDING

- The Township is responsible for 387 (+98 gravel road) lane km of pavements & 91 structures.
- Based on the 2024 PMS update, funding needs on an annual basis to sustain the current pavement condition is in the order of \$2 million per year.
- Based on the recent biannual bridge and major culvert inspections/appraisals (2023), funding on an annual basis to address the total needs is in the order of \$1.63 million per year.
- The approved 2025 Budget and Forecast provides **\$2,000,000** and **\$800,000** per year for pavements and bridge structures respectively to keep the Pavement & Bridge Network in Optimal Condition.



Thank You

Questions ?