Stantec

2024 Inspection Summary

Agenda

1. Introduction
2. Purpose of Presentation
3. OSIM & BCI Value
4. Structure Conditions
5. Maintenance & Investigation Recommendations
6. BCI Values Comparison
7. 2026 Bridge Inspections & Bridge Management
8. Questions

1. Introduction

Introduction

- Eric Tranquada, B.Env.D., P.Eng. (ON & MB)
    - 13-years industry experience (bridges and dams)
    - Certified by US Federal Highway Administration (FHWA) in the inspection of Fracture Critical Steel Bridges
    - Certified by Society of Professional Rope Access Technicians (SPRAT) as Level 2 Technician
    - More than 500 bridge inspections

2. Purpose of Presentation

Purpose

- Discuss inspection system used, calculation of Bridge Condition Index (BCI) and its meaning
- Discuss condition of each bridge and provide maintenance costs (excludes engineering)
- Discuss future inspections and bridge management
- Answer questions

3. OSIM & BCI Value

OSIM

- Ontario Structure Inspection Manual (OSIM) 2018 Revision
- Bridge discretized into elements and sub-elements; generally inspected within arms reach.
- Defines material defects, element performance, and how categorize defects into Excellent, Good, Fair, Poor condition state.
- Provides recommendations for maintenance work, additional investigations, and timing of repairs.

BCI Value

- BCI: Bridge Condition Index
  - single number (0 to 100) representing the weighted condition of the bridge elements to calculate the theoretical remaining bridge value against the ‘as new’ asset value.
  - Based on OSIM inspection and quantities in Excellent, Good, Fair, Poor.

BCI Value

- BCI used as an indicator to determine a bridge's overall condition to help with resource and budget management.
- BCI can increase following maintenance or rehabilitation.

BCI Value

BCI Number Range	Bridge Condition
100	Excellent (like new)
≥70 to <100	Good
≥60 to <70	Fair
<60	Poor

Important: a critical defect may still exist even though the BCI number is high.

Highlights the importance of understanding the BCI number

BCI Value

City of Kenora Bridges	BCI	City of Kenora Bridges	BCI
Bay Street Overpass	60.46	Matheson Street Bridge	70.39
Beggs Road Timber Bridge	69.68	Mink Bay Pedestrian Bridge	88.77
Beggs Road Arch Culvert	88.47	Norlen Bridge	86.91
Cameron Bay Bridge	81.99	Parson Street Bridge	68.27
Coker Road Bailey Bridge	98.42	Portage Bay Bridge	64.48
CPR Pedestrian Bridge	77.99	Portage Bay Walkway Bridge	71.39
Darlington Bay Bridge	75.07	Portier Bridge	72.75
Eighth Avenue Bridge	79.15	Seventh Avenue South Bridge	97.18
First Avenue Bridge	72.36	Winnipeg River East Branch Bridge	84.04
Keewatin Channel Bridge	70.85	Winnipeg River West Branch Bridge	73.53
Lajeunesse Bridge	71.19		


BCI Map
Structure Condition
Good
Fair
Poor
Not included in BCI
Waste Transfer Station
Darlington Bay Bridge
Portage Bay Walkway Bridge
Portage Bay Bridge
Keewatin Channel Bridge
Mink Bay Ped. Bridge
Bay Street Overpass
Parson Street Bridge
Cameron Bay Bridge
Winnipeg River West Branch Bridge
Winnipeg River East Branch Bridge
Matheson Street Bridge
CPR Pedestrian Bridge
Parkade
8th Avenue Bridge
7th Avenue Bridge
1st Avenue Bridge
9th St N
Railway St
Park St
Rabbit Lake Rd
17A
17


BCI Map
Structure Condition
Good
Fair
Poor
Not included in BCI
Beggs Road
Arch Culvert
Beggs Road
Timber Bridge
Coker Road
Bailey Bridge
658
Norlen Bridge
Lajeunesse
Bridge
Portier Bridge

4. Structure Conditions

Structure Conditions

BAY STREET OVEPASS

BCI Rating	60.46

- Abutment Walls
  - Wide cracks and delaminations
- Ballast Walls
  - Exposed on ends, SE missing retainer with loose rock
- Deck Soffit
  - Delaminations at corners exposing corroded reinforcement

Recommendation:

Complete Maintenance	$35,000

Structure Conditions

BEGGS ROAD TIMBER BRIDGE

BCI Rating	69.68

- Deck Wearing Surface
  - Severe wear and exposed nail heads
- Curbs
  - Isolated interior rot on East curb
- Approaches Wearing Surface
  - Severe wheel path rutting with potholes in gravel
- Foundations
  - Possible translation of piles causing gaps between abutment and wingwalls
  - No further movement measured from previous inspection

Recommendation:

Complete Maintenance	$69,200

Monitor South Abutment Wall and Piles movement at next inspection

REGULAR OSIM

Structure Conditions

BEGGS ROAD ARCH CULVERT

BCI Rating	88.47

- Abutment Wall - North
  - Isolated vertical medium to wide crack at center of barrel
- Abutment Wall - South
  - Erosion and construction joint
- Culvert Barrel
  - Isolated deformation at inlet soffit

Recommendation:

None	$0

Structure Conditions

CAMERON BAY BRIDGE

BCI Rating	81.99

- Approach Sidewalks
  - Vegetation growth
- Barriers - Posts
  - Missing and loose bolts connecting the railing
- Joints
  - Joints filled with gravel

Recommendation:

Complete Maintenance	$4,000

Structure Conditions

COKER ROAD BAILEY BRIDGE

BCI Rating	98.42

- Approach Wearing Surface - North
  - Up to 30mm depression along joint armouring (increase since previous inspection)
- Coatings – Structural Steel - Panels
  - Isolated peeling galvanizing
- Bracing – Under Deck
  - Loose connection to post on West side, fully expanded

Recommendation:

Complete Maintenance	$3,000

REGULAR OSIM

Structure Conditions

CPR PEDESTRIAN BRIDGE

BCI Rating	77.99

- Approach Access Stairs
  - Majority of treads are loose and angled downwards due to:
    - Rust packing in support channels
    - Isolated rot with missing bolt connections
    - Isolated splits
- Piers – Bearings – Third Platform on North App.
  - Missing steel plates

Recommendation:

Complete Maintenance	$126,600

REGULAR OSIM

Structure Conditions

DARLINGTON BAY BRIDGE

BCI Rating	75.07

- Approach & Deck – Wearing Surfaces
  - Isolated severe potholes
- Joints
  - Debris and gravel in joints

Recommendation:

Complete Maintenance	$2,600

Structure Conditions

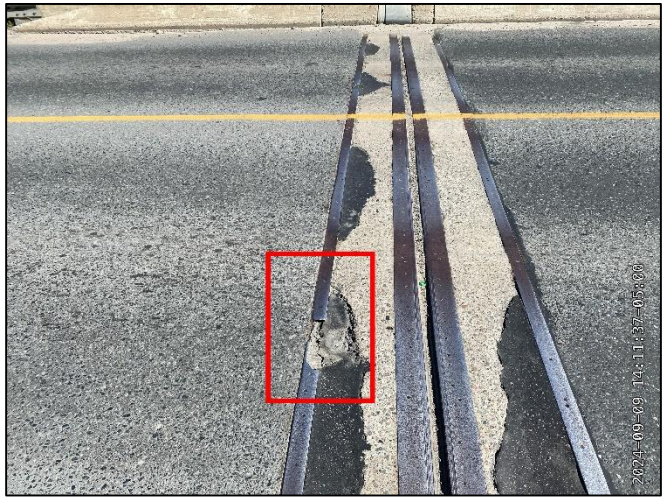
EIGHTH AVENUE BRIDGE

BCI Rating	79.15

- Accessories – North Abutment
  - Missing light
- Barriers - Posts
  - Isolated missing bolts
- Embankments
  - Vegetation overgrowth encroaching bridge at all corners
- Joints
  - Isolated disintegration and spall exposing corroded reinforcement in end dams
  - Section of steel armouring missing at Abutment 2

Recommendation:

Complete Maintenance	$24,500



REGULAR OSIM

Structure Conditions

FIRST AVENUE BRIDGE

BCI Rating	72.36

- Approach - Sidewalk
  - Settlement of interlocking bricks
- Signs
  - Missing Bylaw sign and No Wake sign
- Joints
  - Isolated bolt missing on armouring
  - Seals are leaking
- Embankments
  - Vegetation growth on NE concealing signage
- Abutment - Bearings
  - Abutment 1 B7 is starting to walk out

Recommendation:

Complete Maintenance	$26,000

Monitor next inspection	Abutment Bearing Movement

Structure Conditions

KEEWATIN CHANNEL BRIDGE

BCI Rating	70.85

- Deck - Drainage
  - Isolated detached and broken drain connections
- Coatings – Structural Steel
  - Coating loss and intercoat delamination throughout truss arch elements
- Abutments
  - Used drug needles throughout
- Approaches - Sidewalk
  - Disintegration exposing corroded reinforcement at SW sidewalk

Recommendation:

Complete Maintenance	$5,006,500

Steel recoating addressed under separate contract

REGULAR OSIM

Structure Conditions

LAJEUNESSE BRIDGE

BCI Rating	71.19

- Abutment Footings
  - Severe spalls and disintegration with isolated areas exposing corroded reinforcement
- Approaches – Wearing Surface
  - NE embankment material loss starting to encroach the roadway

Recommendation:

None	$0

Structure Conditions

MATHESON STREET BRIDGE

BCI Rating	70.39

- Abutment – Bearings (previous enhanced OSIM)
  - Disintegration of grout pads
- Accessories – Signs – South approach
  - Missing ‘Keep Right’ sign and beacon
- Accessories – Electrical – South approach
  - Missing light pole
- Approach & Deck – Wearing Surfaces
  - Isolated potholes and severe wheel path rutting
- Embankments
  - Overgrown vegetation encroaching structure

Recommendation:

Complete Maintenance	$36,900

Recommend increasing enhanced inspections to every 4 years to monitor bearing condition

REGULAR OSIM

Structure Conditions

MINK BAY PEDESTRIAN BRIDGE

BCI Rating	88.77

- Abutment - North
  - Slight movement and bending of anchor bolts due to expansion

Recommendation:

None	$0

REGULAR OSIM

Structure Conditions

NORLEN BRIDGE

BCI Rating	86.91

- Abutment & Ballast Walls
  - Delamination and spalls exposing corroded reinforcement
- Deck Soffit
  - Isolated delaminations and spalls

Recommendation:

None	$0

REGULAR OSIM

Structure Conditions

PARSON STREET BRIDGE

BCI Rating	68.27

- Abutment – Ballast Wall
  - Disintegration exposing corroded reinforcement
- Barriers – Railing Systems
  - Missing bolt on West barrier
- Embankments
  - Overgrown vegetation encroaching structure and NE roadway
- Deck - Soffit
  - Leachate, severe delaminations, spalls, severe scaling exposing corroded reinforcement, and medium cracks

Recommendation:

Complete Maintenance	$47,500

Recommend detailed deck condition survey

REGULAR OSIM

Structure Conditions

PORTAGE BAY BRIDGE

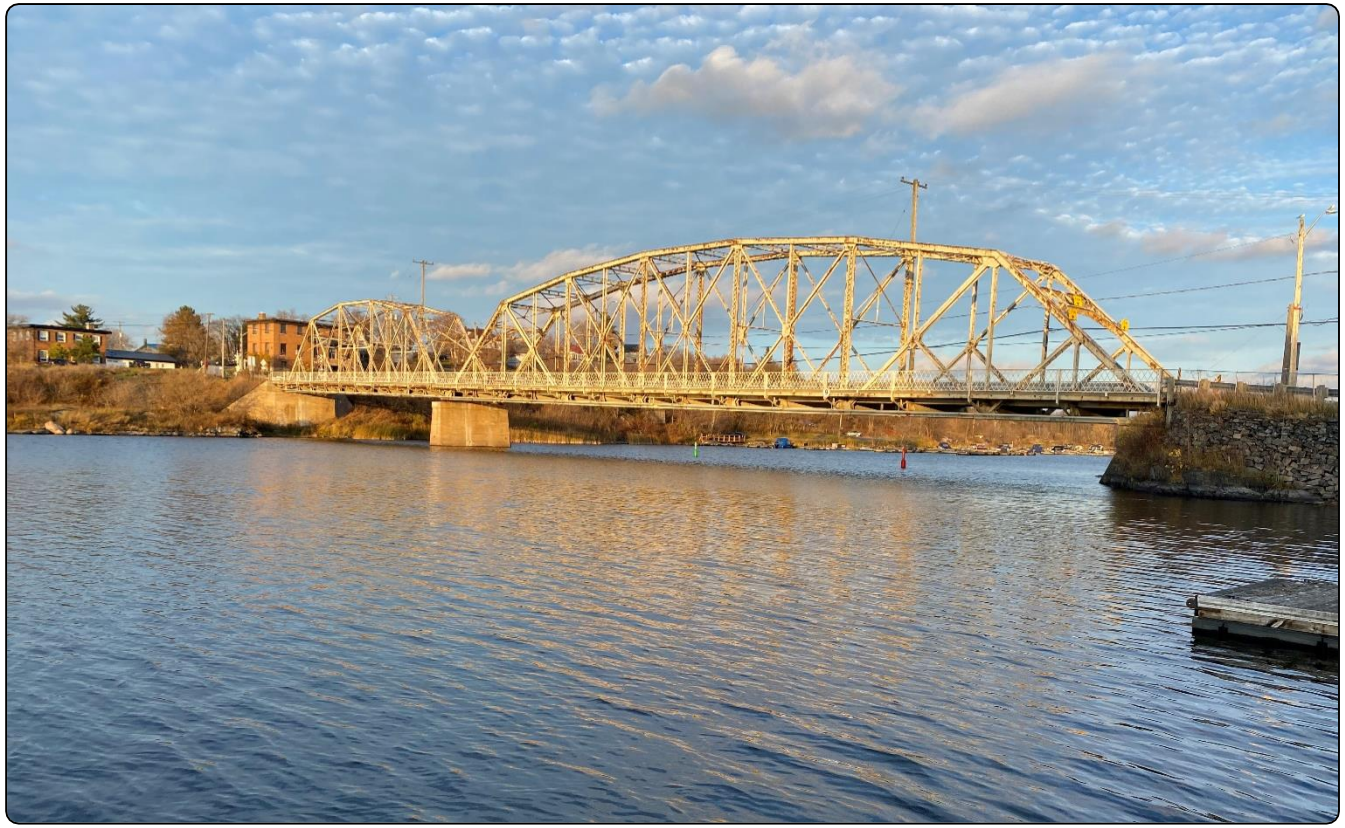
BCI Rating	64.48

- Barriers - Posts
  - Isolated loose connection bolts to railing
- Embankments
  - Heavy vegetation growth
- Joints
  - Very severe spall at Abutment 2 end dam leaking water onto abutment. Joints filled with debris
- Pier – Bearings – Pier 1, Span 1
  - Broken anchor bolt on B1
- Truss
  - Loose and missing rivets throughout
  - Severe corrosion and perforations in bottom chords, gusset plates, bracing, and floorbeams

Recommendation:

Maintenance	**$430,500**
Rehabilitation	**$5.98**

Recommend bridge closure due to perforations in lower chord
Recommend Substructure Condition Survey & Structure Evaluation



Structure Conditions

PORTAGE BAY WALKWAY BRIDGE

BCI Rating	71.39

- Stair Stringers
  - Rot in stringers on North and South sides
- Barriers – Railing Systems
  - Missing a bolt and a couple nuts connection to posts
- Arch
  - Several areas of separation between the Glulam layers
  - Missing 1 of 3 nut connecting the arch to the concrete

Recommendation:

Complete Maintenance	$20,500

Structure Conditions

PORTIER BRIDGE

BCI Rating	72.75

- Joints
  - Gravel filled joints
- Approaches – Wearing Surface
  - Isolated vegetation growth along interior barrier

Recommendation:

Complete Maintenance	$3,200

REGULAR OSIM

Structure Conditions

SEVENTH AVENUE SOUTH BRIDGE

BCI Rating	97.18

- Embankments
  - Slight settlement with undermining along NE sidewalk
  - Excessive used needles found in front of abutments
- Abutment - Bearings
  - 1 of 3 anchor bolts at Abutment 1 West and East sides retainer plates is not tight.
- Joints - Sealant
  - Evidence of leaking onto Abutment 1 West side

Recommendation:

Complete Maintenance	$8,100

REGULAR OSIM

Structure Conditions

WINNIPEG RIVER EAST BRANCH BRIDGE

BCI Rating	84.04

- Accessories - Utilities
  - Separated conduit with exposed wires
- Approaches – Wearing Surface
  - Severe pothole at Joint 1
- Approaches - Sidewalk
  - Very severe spall exposing corroded reinforcement on SW sidewalk
- Barriers - Railing
  - Several missing bolt connections to posts
- Joints
  - Armouring is missing 6 bolts at Joint 1
  - Severe spalls in Joint 1 End Dam
  - Joints filled with debris

Recommendation:

Complete Maintenance	$15,000

Recommend Detailed Deck Condition Survey - Soffit condition

REGULAR OSIM

Structure Conditions

WINNIPEG RIVER WEST BRANCH BRIDGE

BCI Rating	73.53

- Accessories - Utilities
  - NW light pole has an open panel
- Approaches & Deck – Wearing Surface
  - Severe pothole and crack at Approach 1
  - Severe potholes and delaminations at Joint 1 with 40mm differential
- Approaches - Sidewalk
  - 25mm elevation differential at Abutment 2
- Barriers – Railing – Deck & Approaches
  - Several missing bolt connections to posts and newel
- Joints
  - Armouring is missing a section above Pier 3
  - Joints filled with gravel

Recommendation:

Complete Maintenance	$22,600

Recommend monitoring stringers and spandrel arch's cracks in concrete

REGULAR OSIM

Structure Conditions

KENORA PARKADE

- Accessories - Utilities
  - Utilities: Several Luminaires not functioning
  - Signs: One ‘Reserved Parking’ sign is illegible
- Stairwells
  - Grout packing is falling out and several non-functioning lights
  - 1st level concrete entry pad could cause tripping hazard
- Barriers
  - Hollowcore has 10mm remaining bearing at parking #385
  - Deformation of steel barrier at NE corner
- Columns
  - Delaminated concrete spalling onto sidewalk below
- Wearing Surface
  - Extensive used needles and paraphernalia throughout
  - Several areas of settlement and missing paving stones
- Beams – Double-T section
  - Hairline to narrow shear cracks on select girders throughout

Recommendation:

Complete Maintenance	**$46,700**

Recommend Detailed Deck Condition & Substructure Surveys, Structure Evaluation, and monitoring girder crack widths

REGULAR OSIM

Structure Conditions

WASTE TRANSFER STATION

- Walls - Exterior
  - Severe spall exposing corroded reinforcement on South wall
- Walls – Substructure Interior
  - Large amount of standing water in SW corner
- Joints - Armouring
  - Missing section of plate

Recommendation:

Complete Maintenance	**$9,500**

Multiple rigid frame columns have been dented and deformed

REGULAR OSIM

5. Maintenance & Investigation Recommendations

5. Maintenance & Investigation Recommendations

- Difficulty attracting qualified contractors to complete non-capital, maintenance work, due to:
  - Low fees
  - Out-of-town expenses for non-local
  - Ontario contractor requirements that differ from Manitoba
- Recommend grouping maintenance together into larger work packages for tendering and bidding
- Costs may be volatile with political issues between Canada and United States making accurate cost estimates challenging

5. Maintenance & Investigation Recommendations

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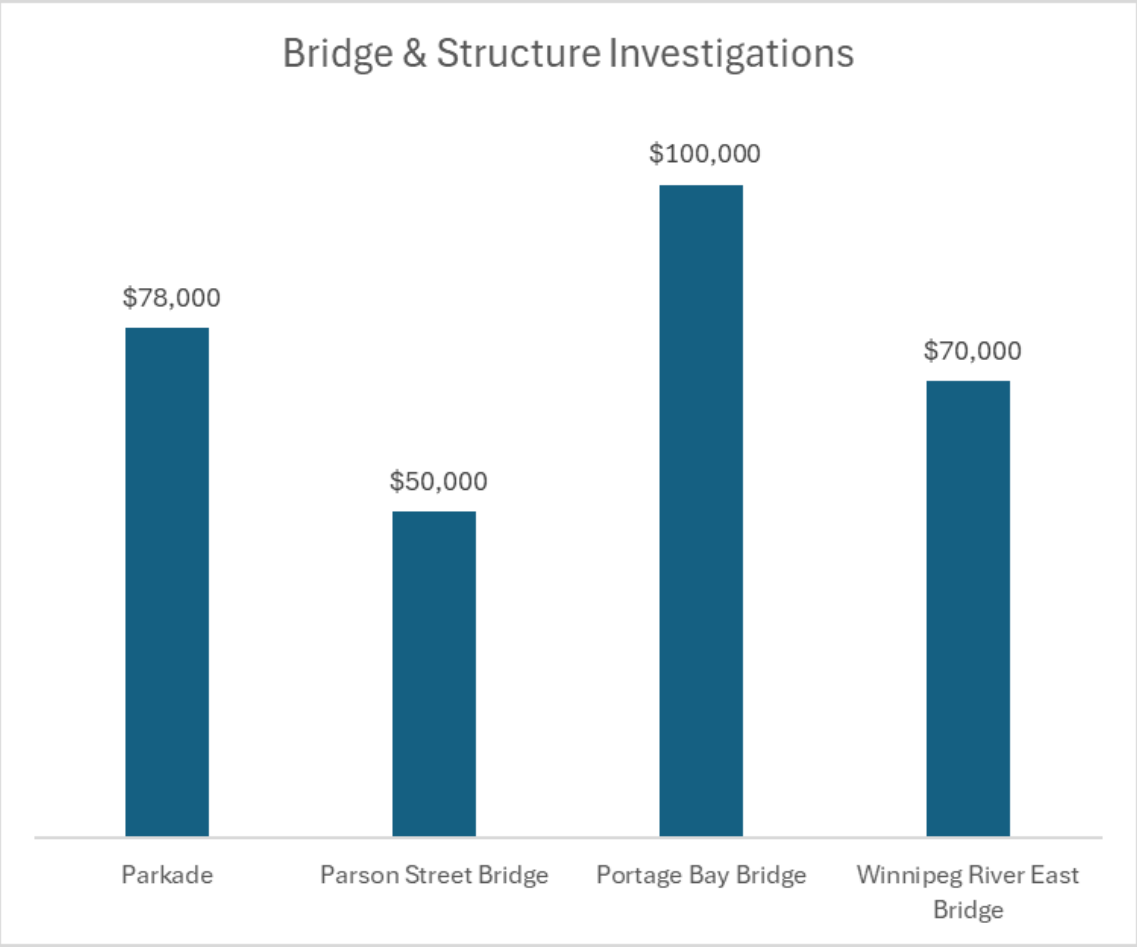

6. BCI Values Comparison

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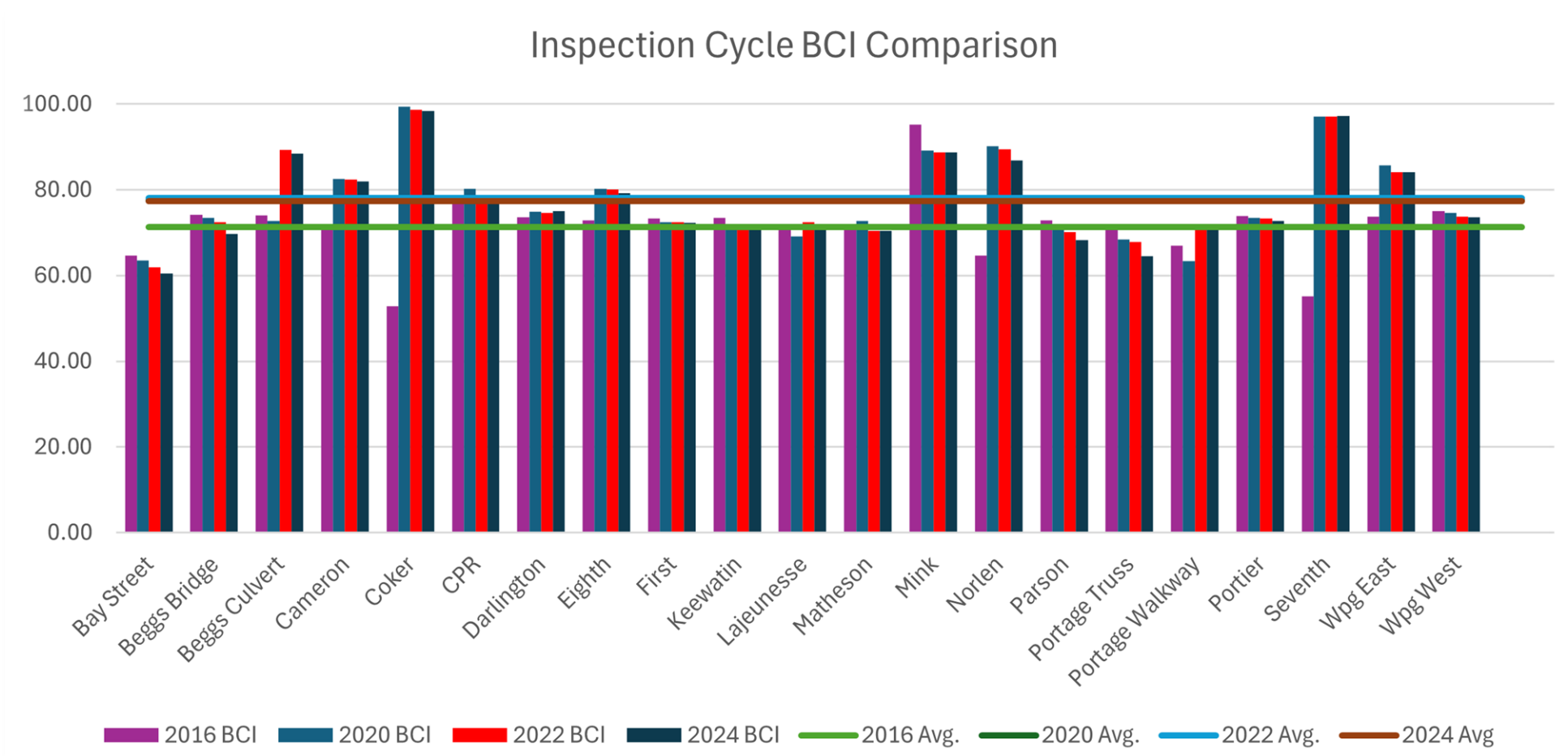
- Review of BCI values from 2016, 2020, 2022, and 2024 indicate consistent change with incremental decreases in BCI
- Trend is showing that repair and rehabilitation is successful for asset value and BCI
- Several structures have improved from Fair to Good condition
- Continuing to follow OSIM guidelines and maintain structures allows for steady stream of repairs vs significant capital cost

6. BCI Values Comparison



7. 2026 Bridge Inspections & Bridge Management

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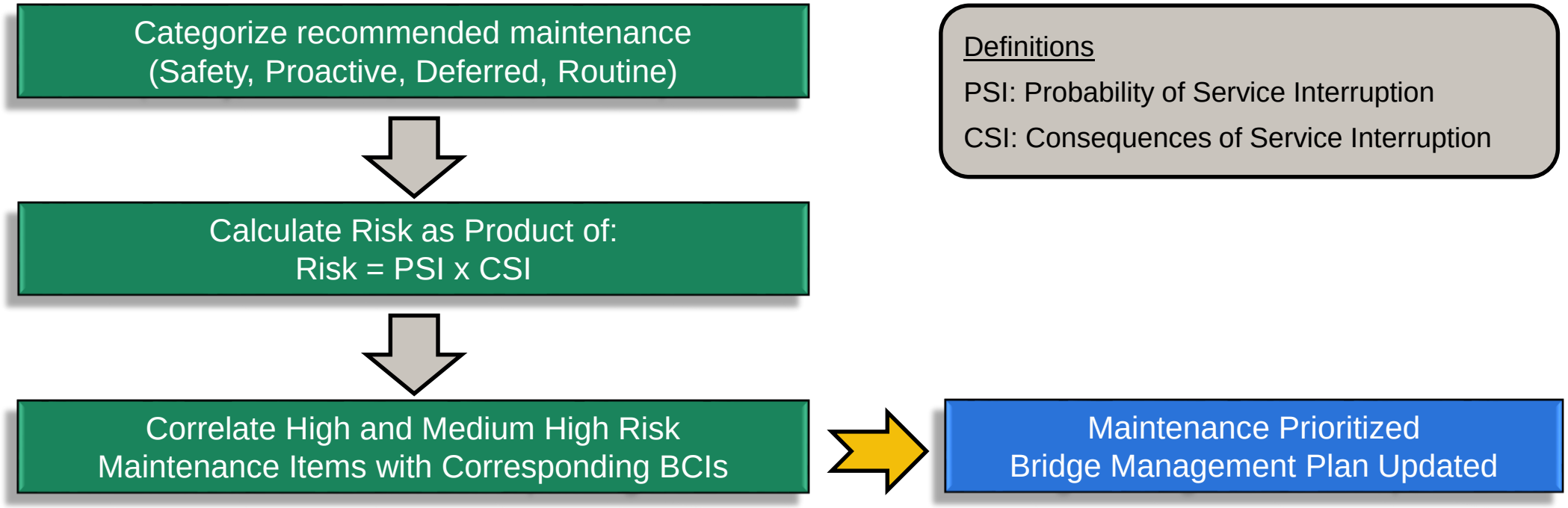
- City of Kenora to continue inspecting structures as per Ontario law:
  - Regular OSIM inspection every 2-years
  - Enhanced OSIM inspection (under bridge crane, climbing, confined space, etc.) every 6-years once bridge is 30 years old
  - Or at the frequency recommended in the OSIM reports

7. 2026 Bridge Inspections & Bridge Management

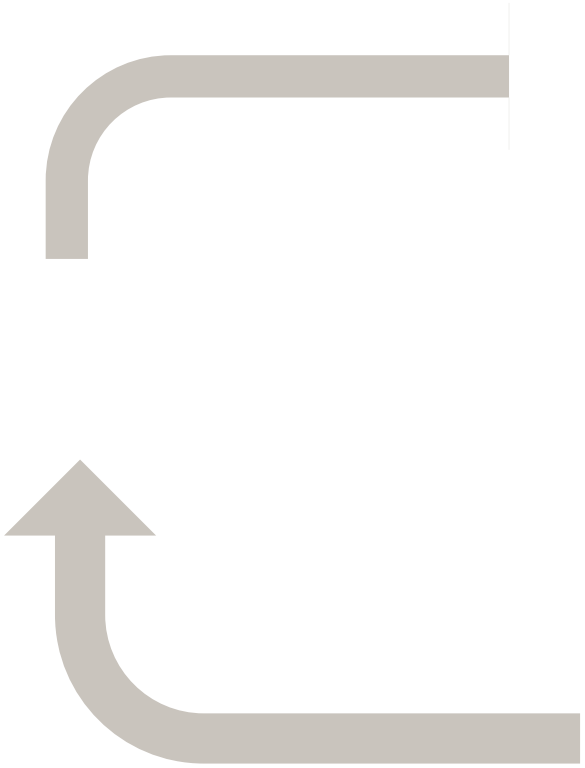
- Maintenance Prioritization is key to Bridge Management and to supplement the BCI



Note: Grouping maintenance packages can also be considered in the prioritization process

7. 2026 Bridge Inspections & Bridge Management

- Maintenance Prioritization is key to cost effective Bridge Management



8. Questions

Stantec

Thank you