

Bridge Deck NDE Program

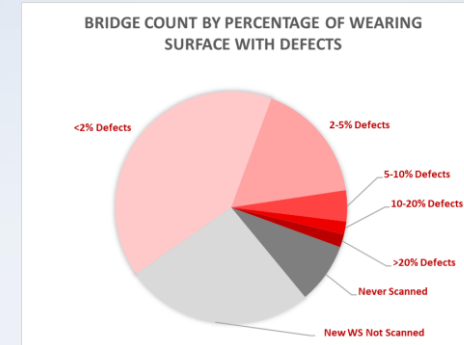
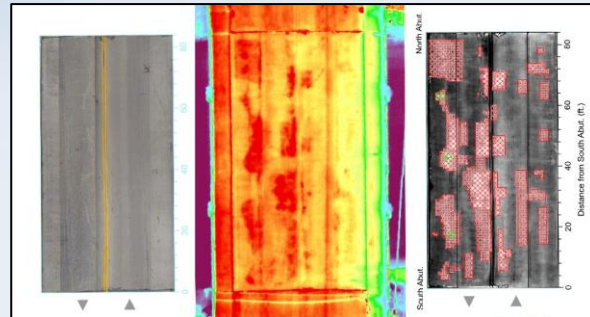
Philip Meinel, PE

Structures Asset Management Engineer



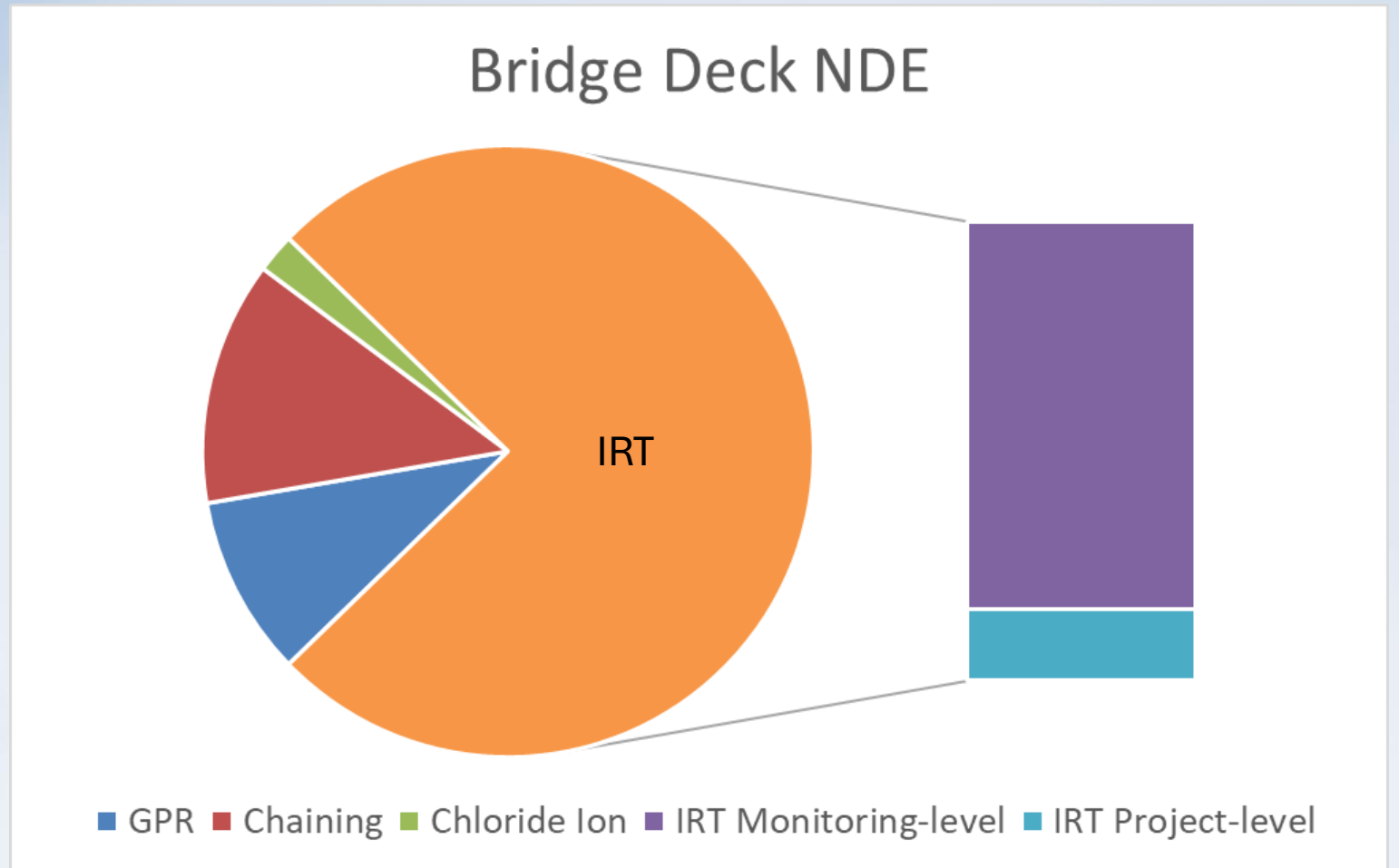
Presentation Overview

- See the
 - Program
 - Unseen
 - Trend
 - Impact



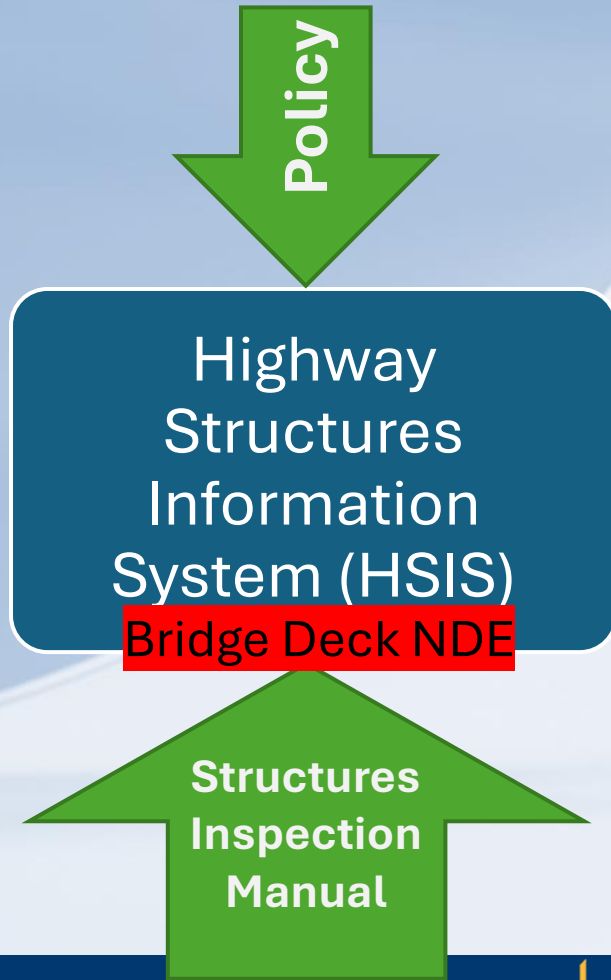
See the Program

- Bridge Deck NDE
 - IRT
 - GPR
 - Manual Chaining
 - Chloride Ion Testing
 - Automated Sounding



See the Program

- 2014 – Implemented AASHTO Elements statewide
 - WI uses ADEs to track deterioration of individual wearing surfaces



Chapter 6.D – Wearing Surfaces

D. Wearing Surfaces

Wearing Surface Elements

Wearing Surfaces (Other) (Element 510) - This element is for all decks/slabs that have overlays other than those listed below, such as timber running planks.

Wearing Surface (Bare) (Element 8000) - This element defines decks/slabs that do not have a wearing surface and will be coded to capture the top of a deck/slab without a wearing surface.

AC Overlay (Element 8511) – Defines flexible asphaltic overlay.

AC Overlay & Membrane (Element 8512) - Defines flexible asphalt overlays with membranes or PMA systems.

Thin Polymer Overlay (Element 8513) - Defines thin polymer overlays.

Concrete Overlay (Element 8514) - Defines rigid concrete overlays.

Polyester Concrete Overlay (Element 8515) - Defines polyester concrete overlay systems.

See the Program

- 2016 – Clarified Wearing Surface extent
 - Ensure results are recorded under each wearing surface element defect

Policy

Highway Structures Information System (HSIS)

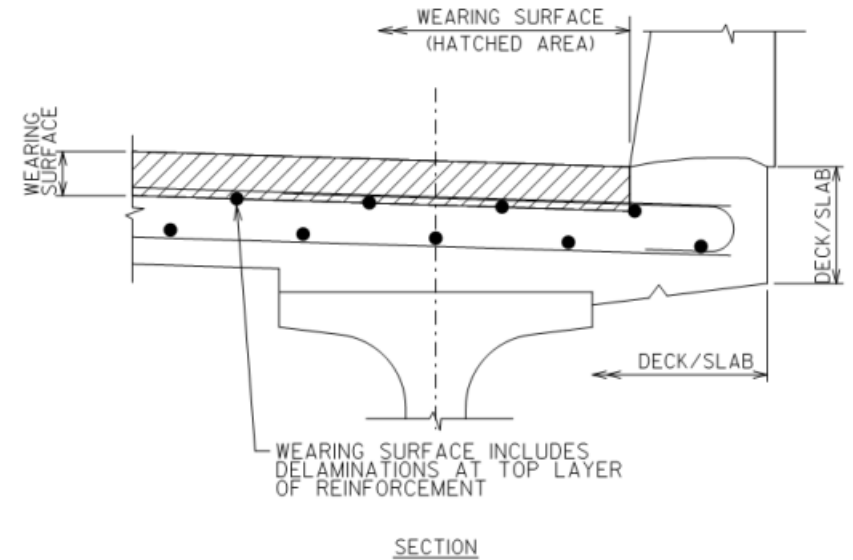
Bridge Deck NDE

Structures Inspection Manual

Chapter 3.J – Wearing Surfaces

J. Wearing Surfaces

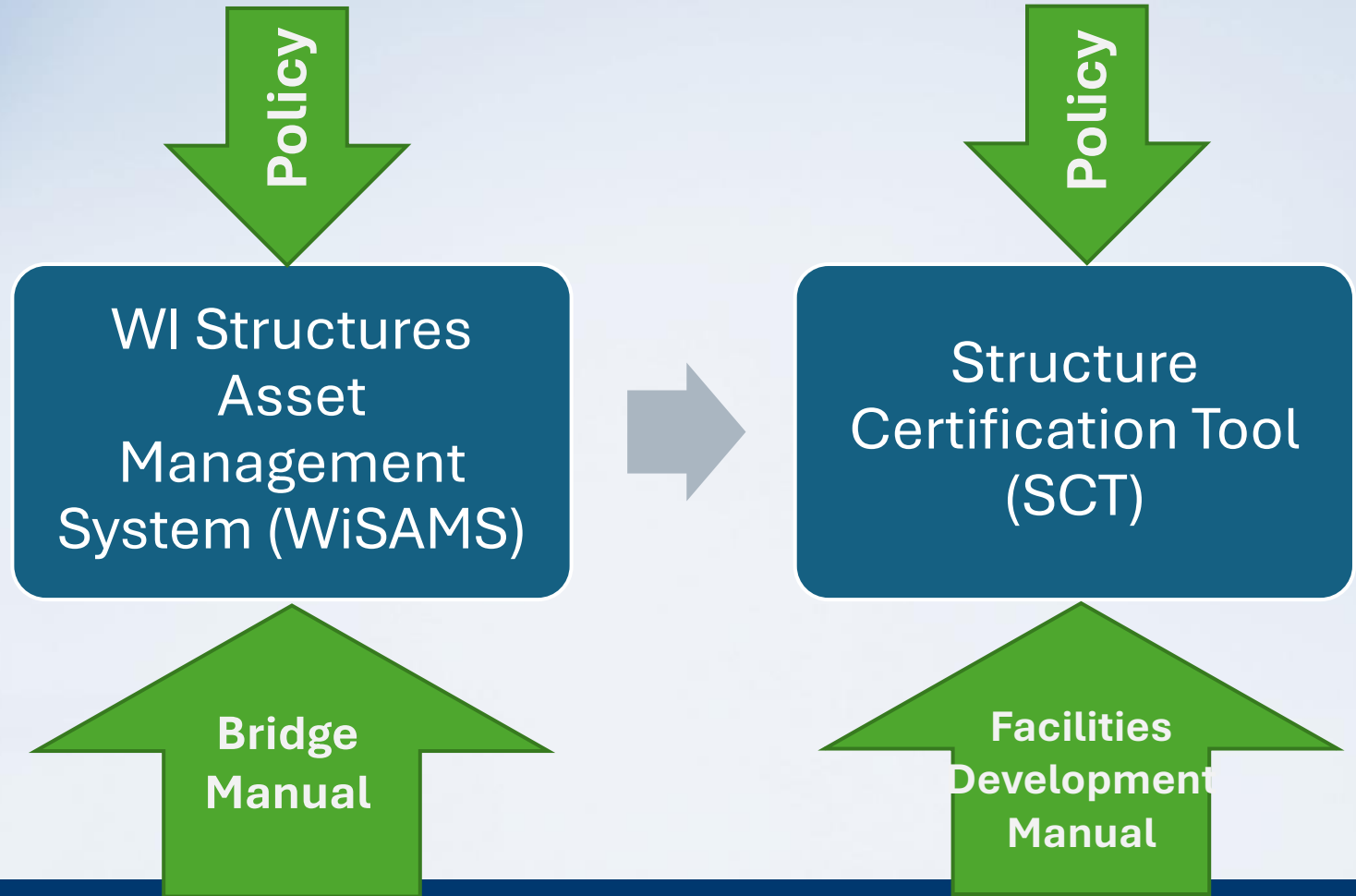
Wearing Surfaces	
510 – Wearing Surfaces (Other)	SF
8000 – Wearing Surface (Bare)	SF
8511 – AC Overlay	SF
8512 – AC Overlay & Membrane	SF
8513 – Thin Polymer Overlay	SF
8514 – Concrete Overlay	SF
8515 – Polyester Concrete Overlay	SF



Defect 3210 IR/Thermography or GPR Results for delaminations down to the top layer of reinforcement should be quantified under Defect 3210 under the applicable wearing surface element.

See the Program

- 2017 – WiSAMS first official report
 - BMS Optimizer
 - Projected work recommendations
- 2019 – Structures Certification process
 - Central office approval of all structure work



See the Unseen

- 2020 - 36 year old deck, inspector only recorded 16 SF spalling found by visual inspection

Elements						Quantity in Condition State			
Chk	Element	Defect	Description	UOM	Total	1	2	3	4
X	12		Reinforced Concrete Deck-Coated Reinforcing	SF	4,190	3,716	472	2	0
		1080	Delamination - Spall - Patched Area Under side of deck at SW and NE corners 2' CS3 (PIC)	SF		0	0	2	0
		1130	Cracking (RC) Leaching transverse cracks in all 3 spans.	SF		0	472	0	0
	8000		Wearing Surface (Bare)	SF	3,842	3,673	100	69	0
		3210	Debonding/Spall/Patched Area/Pothole Spalls in SB lane. (PICS)	SF		0	0	16	0
		3220	Crack (Wearing Surface) Both end blocks need repair. Transverse and longitudinal cracks at ends.	SF		0	100	53	0

See the Unseen

- 2020 - 36 year old deck, inspector only recorded 16 SF spalling
- 2021 – IRT/HRI recommends adding 111 SF CS2 delamination and concrete patching and 12 SF CS3 asphalt patching

Inspection

Edit History Interval Structure information Condition ratings Notes / requirements Documents / images Maintenance Deck evaluation

IR

Measured by
AECOM X

Notes
A level 1 IR survey was collected at posted speed on 5/5/21.

Time of scan
05/05/2021 X 11:50 a Level Values Only (1) v

Asphalt Patching (%)	Concrete Patching (%)	Debonding (%)	Delamination (%)	Spall (%)
0.3	0.3		2.6	0.0

Validation Methods
None X

delete

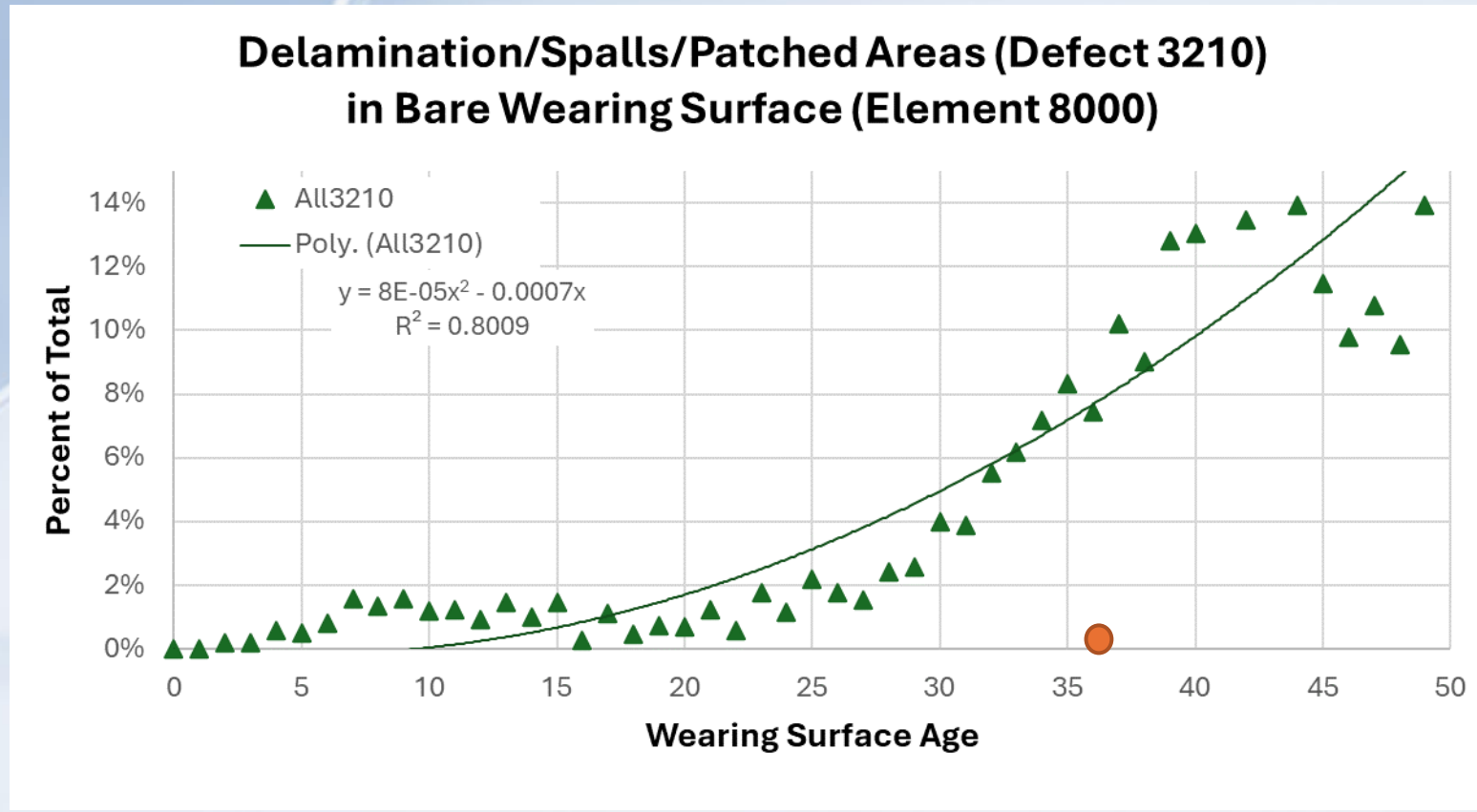
See the Unseen

- 2020 - 36 year old deck, inspector only recorded 16 SF spalling
- 2021 – IRT recommends adding
- 2022 – Inspector added 111 SF of CS2 delamination

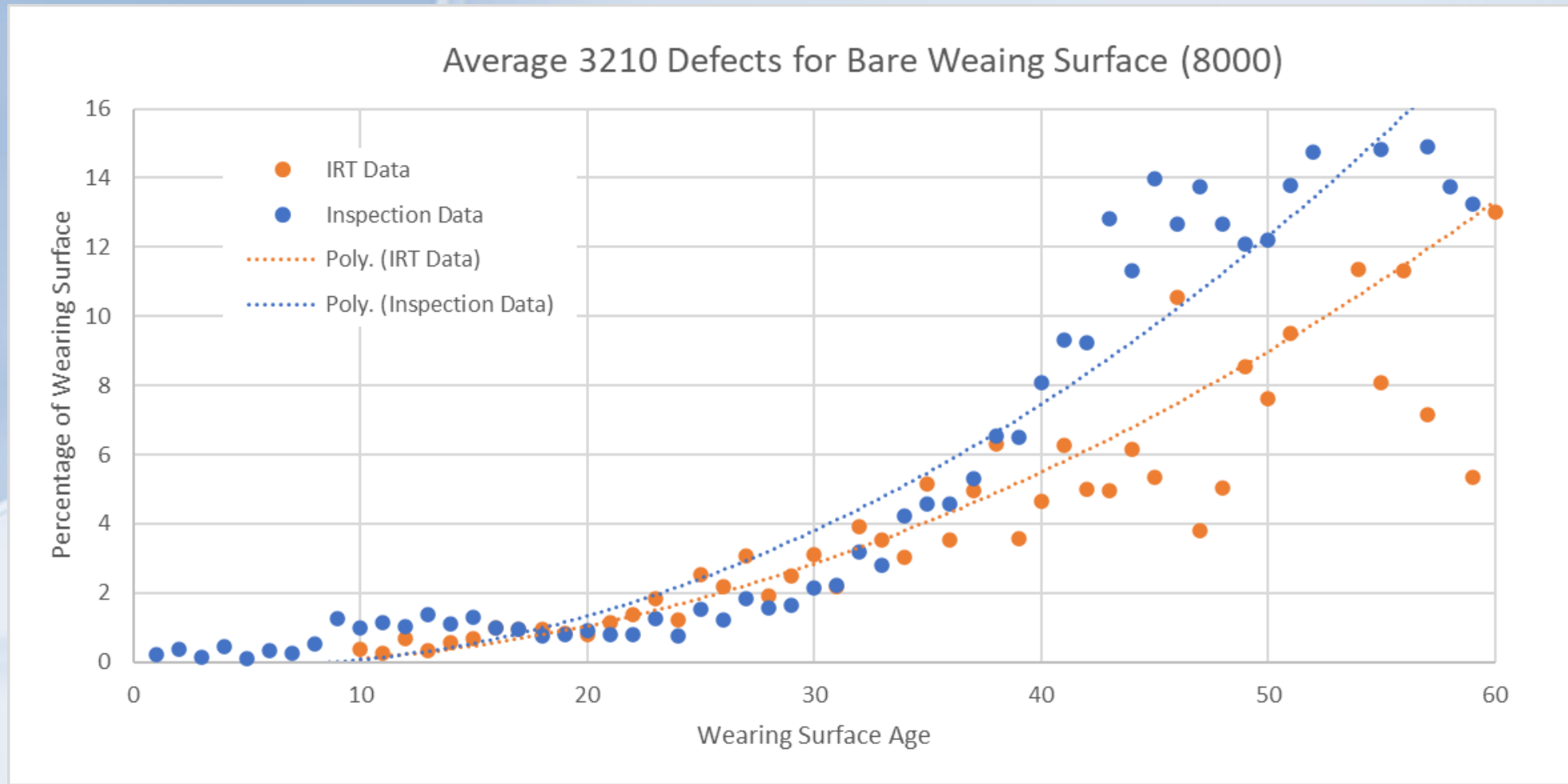
Elements						Quantity in Condition State			
Chk	Element	Defect	Description	UOM	Total	1	2	3	4
X	12		Reinforced Concrete Deck-Coated Reinforcing	SF	4,190	3,715	472	3	0
		1080	Delamination - Spall - Patched Area Under side of deck at SW and NE corners 2' CS3.	SF		0	0	2	0
		1130	Cracking (RC) Leaching transverse cracks in all 3 spans. Heavy efflorescence under SE corner of deck.	SF		0	472	1	0
	8000		Wearing Surface (Bare)	SF	3,842	3,562	211	69	0
		3210	Debonding/Spall/Patched Area/Pothole Spalls in SB lane. May 2021 Level 1 IR deck survey indicates 0.3% asphalt patching, 0.3% concrete patching, 2.6% delamination and no spalling.	SF		0	111	16	0
		3220	Crack (Wearing Surface) Both end blocks need repair. Transverse and longitudinal cracks at ends.	SF		0	100	53	0

See the Trend

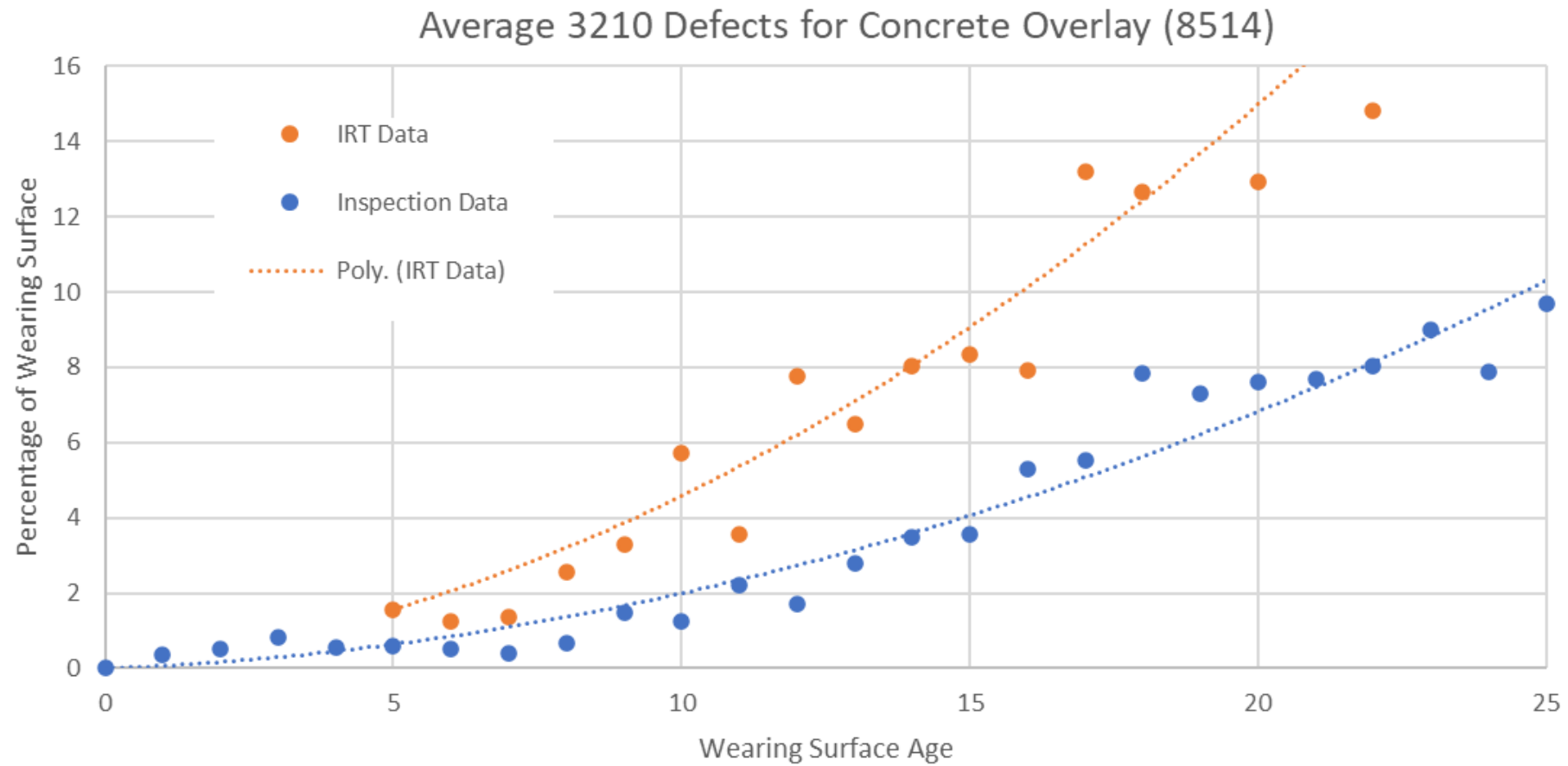
- Typical deterioration of Wearing Surface (Bare) ADE 8000



See the Trend



See the Trend



See the Impact

- Globally...not much, but for this individual structure...
 - Visual only inspection
 - No work action
 - Visual with IRT results
 - 2035 concrete overlay



Structures Certification Tool (SCT) Build V4.5.1.1.2024.09.04

Resources | Today's Date: 2024-09-04 | FIIPS Query Tool

Search By ID: Structure ID b110008, SCT ID, FIIPS ID

Mapping: Search SCT, Search FIIPS, Retain Markers, Markers, Map My Projects, Map All Projects

Legend: No Elig, No Wor

Drag using left mouse button, zoom using mouse wheel
Left click marker to open project or structure view
Right click marker for other options
Right click, drag, and release map to do area search

Structure: B110008

Projects & Work Concepts | SCT History | Review/Propose History | Map | Data | Inspection Cover Photo

Status: No Eligible Work, Pending Review, Eligible, Unapproved, Precertified, Certified, FIIPS

Work Concepts

Work Concept	Fiscal Year	Add to Project	Delete Proposed	Review
OVERLAY DECK - CONCRETE	2035	Add	N/A	Review/Edit Propose New

SCT Projects

Work Concept	Project Fiscal Year	Project ID
OVERLAY DECK - CONCRETE / PAINT	2029	61400172

FIIPS Projects

Work Concept	Project Fiscal Year	Project ID
OVERLAY DECK - CONCRETE / PAINT	2030	61400172

Area and Work Structure Type: Bridge (E), Culvert (I), High Ma, Miscellari, No Plan, Retainin, Sign Brd, Signal M, Sound/N

Region / Owner: 1a-SW I, 1b-SW I, 2-SE W, 3-NE Gr, 4a-NC V, 4b-NC F, 5a-NW, 5b-NW

Owner: State, Local, Local Connecting

Map: Hill Point, Loyd, Devil's Lake State Park, South Bluff / Devils

Bridge Deck NDE Program

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