

Steel Bridge Painting Program

2019 WBPP

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Bridge Asset Management Engineer

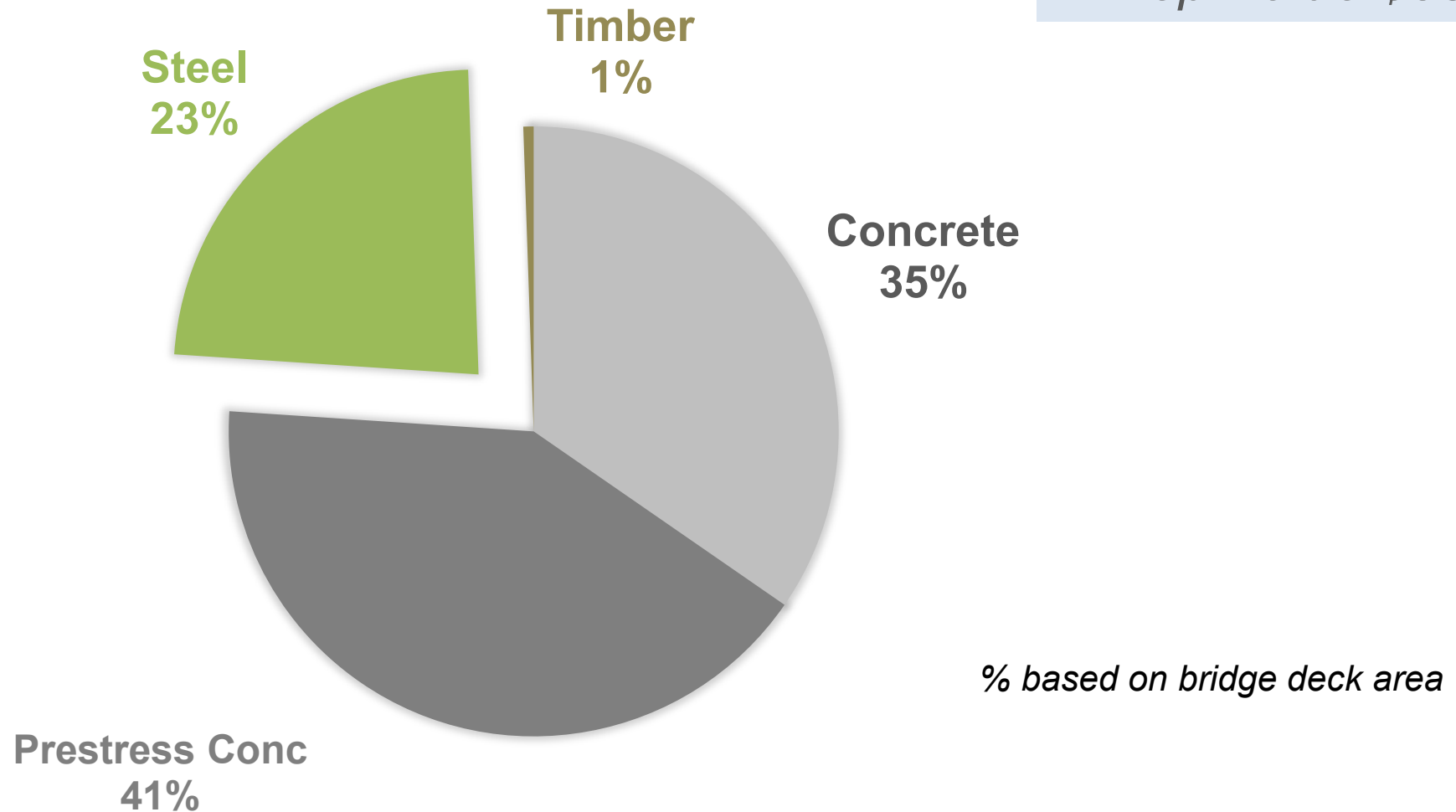


Agenda

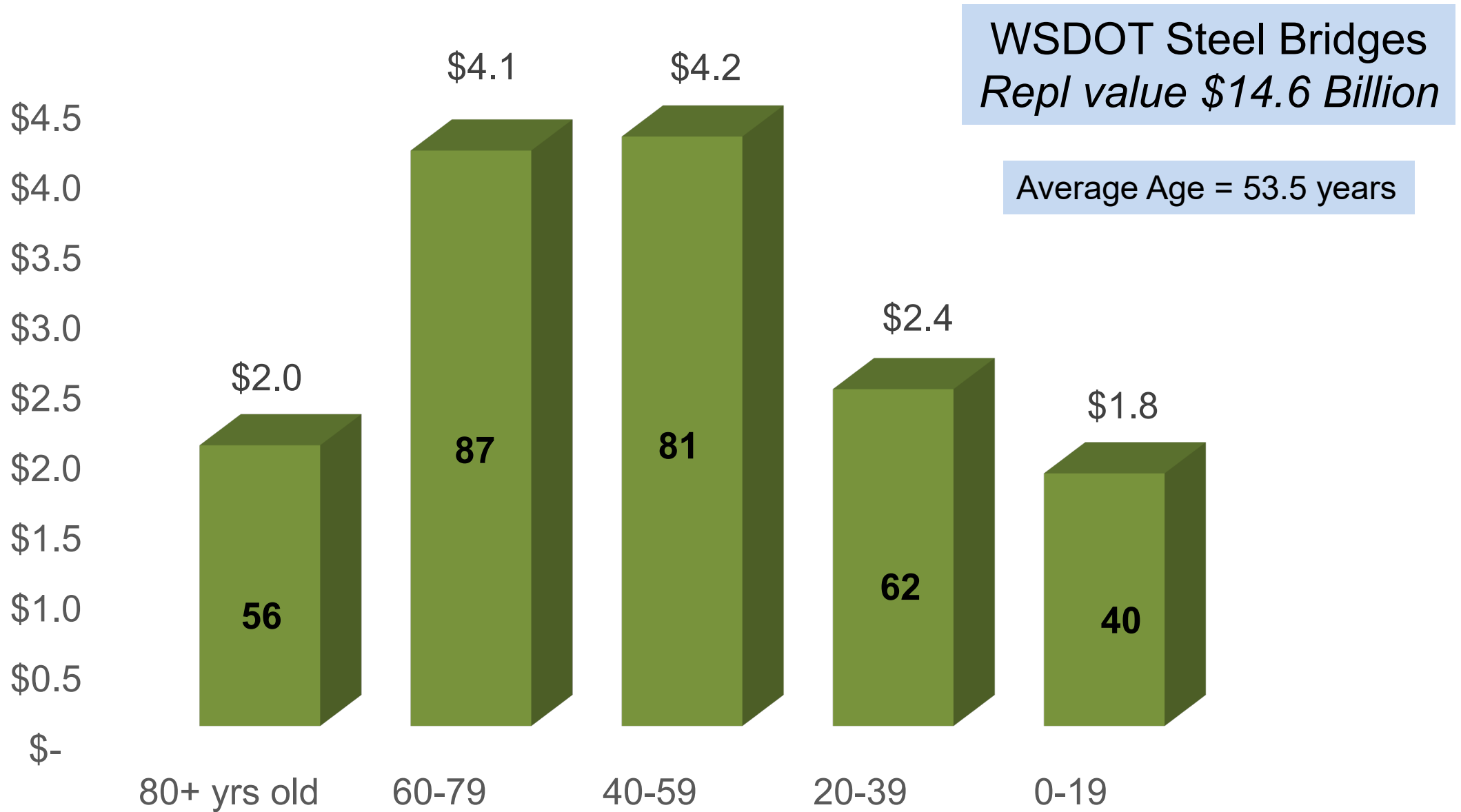
- WSDOT Steel Bridge Network
- Paint History
- Paint Inspection
- 10 year painting needs
- Priorities
- Let them Rust and Replace?
- Design and Construction
- Maintenance Bridge Washing
- Questions

Washington State's Bridge Network

3,322 bridges (54.4 M SF)
Repl value \$58 Billion



Washington State's Steel Bridge Network



WSDOT's Steel Bridge Network



Painted Steel Bridges	296
WSDOT Steel Border Br	4
Oregon Steel Border Br	4
Tacoma Narrows	2
Weathering Steel	18
Bridge Repl Planned	7

WSDOT's Steel Bridge Network

Truss Bridges



119 Steel Truss Bridges (94 Thru Truss / 25 Deck Truss)



WSDOT's Steel Bridge Network

Girder Bridges



241 Girder Bridges (44 Rolled / 28 Riveted / 142 Welded / 6 Open / 21 Box)



WSDOT's Steel Bridge Network

Arch Bridges



9 Steel Arch Bridges (4 Deck Arches / 5 Thru Tied Arch)



WSDOT's Steel Bridge Network



SR173 Brewster Bridge
Year Built - 1970



I-90 East Channel – Lake Wa
Year Built - 1981



US12 Cortright Cr
Year Built - 1983

Weathering Steel Bridges

18 Weathering Steel Bridges
(13 Steel Girder / 4 Steel Box / One Steel Truss)
Five bridges painted with clear epoxy

WSDOT's Steel Bridge Network

Suspension Bridges

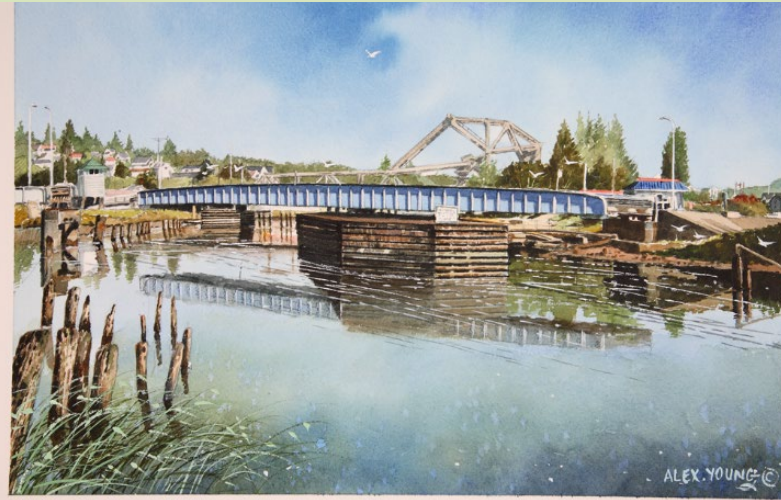


WSDOT's Steel Bridge Network

Movable Bridges



15 Steel Movable bridges on state highways (Three are shared with a Border State)



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Paint History

Lead Based Alkyd

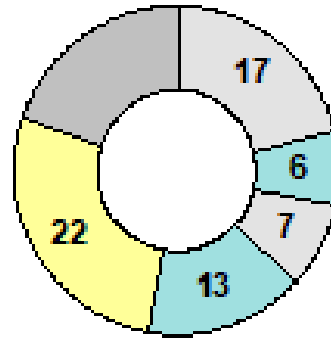
Discontinued 1995

73 Bridges

Ave age of brgs = 66 years

Ave Age since last paint = 32 years

Painting Cycle



Paint History

Zinc Primer / Vinyl

1971 – 1992 *Discontinued*

22 Bridges

Oldest is 48 years
Ave Age = 35 years



Paint History

Zinc Primer / Moisture Cured Urethane

Standard since 1993



Paint History

Steel Truss Bridges



Existing Type of Paint

Cycle (Years)

Lead based Paint

15-20

Zinc/Moisture Cured Urethane Paint

20-25

Paint History

Existing Type of Paint

Cycle (Years)

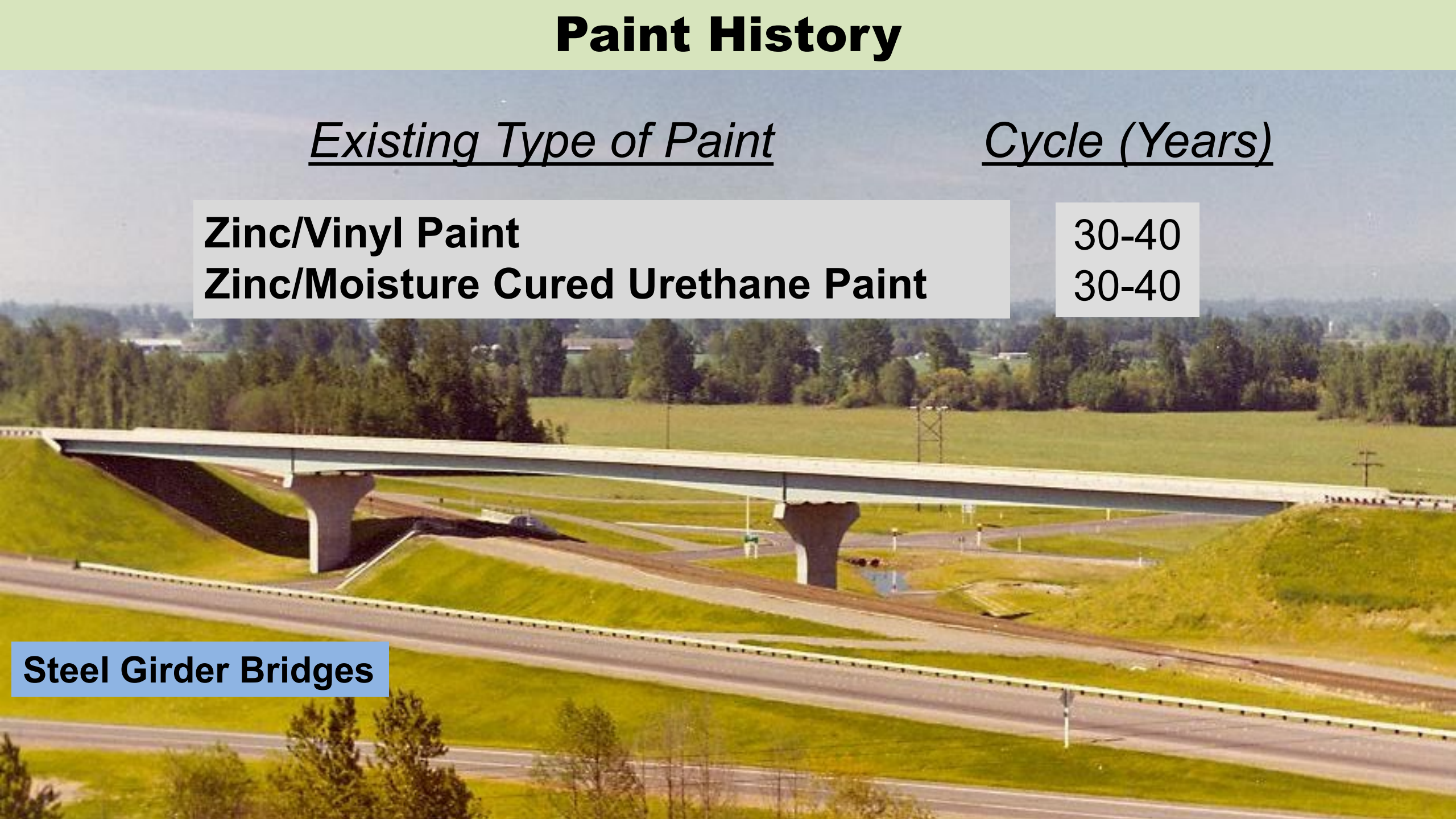
Zinc/Vinyl Paint

30-40

Zinc/Moisture Cured Urethane Paint

30-40

Steel Girder Bridges



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Paint Inspection



Paint Inspection

Paint Cond State 1:

The paint system is sound and functioning as intended.



Paint Cond State 2:

The paint system may be chalking, peeling, curling, or showing distress with no exposure of metal.



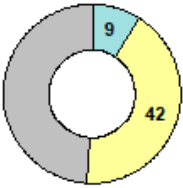
Paint Cond State 3:

The paint system is no longer effective. The metal substrate is exposed.



Paint Inspection

Painting Cycle



42

■ = Current Paint Age

Condition
State 1:

The paint system is sound
and functioning as intended.

BMS Elements						
Element	Element Description	Total	Units	State 1	State 2	State 3
904	Organic Zinc/Urethane Paint System	22,440	SF	22,240	200	0

SR20 John Pierce Waterfall Bridge
(Original Paint is 51 yrs old)

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10 year painting needs and funding

OK

Due

Past Due

Paint
Cond State 1:



Paint
Cond State 2:



Paint
Cond State 3:



10 year painting needs and funding



Total Project Paint Cost = \$65 per SF of Steel

10 year painting needs and funding

Bridge deck status	Number of bridges	Steel surface square footage ¹	Cost to repair
Contract work in progress	7	948,600	\$61.8
Past due for painting ²	30	2,061,800	\$111.5
Due for painting ³	69	5,146,100	\$253.8
Border bridges ⁴	4	720,900	\$58.3
To be due in next 10 years	70	6,715,000	\$292.1
Total 10-year needs	180	15,592,400	\$777.5

10 year Painting Needs (minus Contracts) = \$716M

10 year painting needs and funding



10 year Painting Needs = \$716M

10 year Funding = \$515M

0 - 5 years



\$149M

6 - 10 years



\$366M

Agenda

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Priorities



1. Complete Bridge Painting under construction
2. Border Bridges
3. “Past Due” Steel Truss bridges on T1 and T2 Freight Routes.
4. “Past Due” bridges that provide access to an island.
5. “Due” Steel Truss bridges on T1 and T2 Freight Routes.
6. “Past Due” Steel Truss bridges **not** on T1 and T2 Freight Routes.
7. Steel Truss bridges “to be Due over 10 years” on T1 and T2 Freight Routes

Priorities

	Category	No. of Bridges	Steel Area (SF)	Average Paint Age	10 year Cost
0 – 5 years	Construction	NA	NA	NA	NA
	Border	4	560,550	NA	\$36.5 million
	Truss Past Due – T1/T2	8	450,450	21	\$26.3 million
	Truss Past Due - Island	4	665,550	21	\$34.6 million
	Truss Due – T1/T2	17	3,186,030	20	\$140.4 million
6-10 years	Truss Past Due – Other routes	14	444,300	24.5	\$22.4 million
	Truss – To Be Due	21	4,047,645	16	\$163.5 million
		68			\$424 million

WSDOT Steel Bridge Painting - 2019

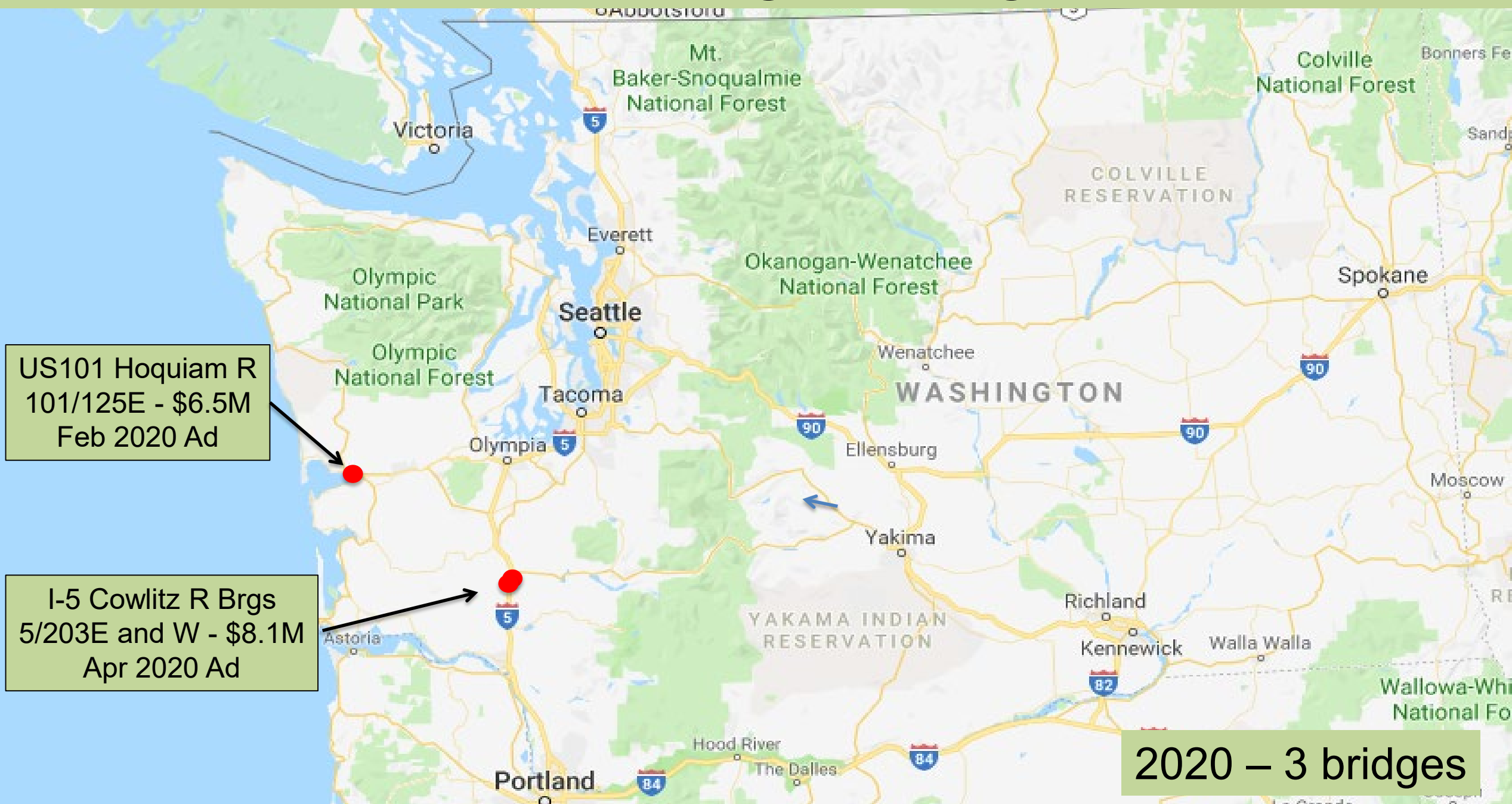


2019 – 8 bridges

WSDOT Steel Bridge Painting - 2020

US101 Hoquiam R
101/125E - \$6.5M
Feb 2020 Ad

I-5 Cowlitz R Brgs
5/203E and W - \$8.1M
Apr 2020 Ad

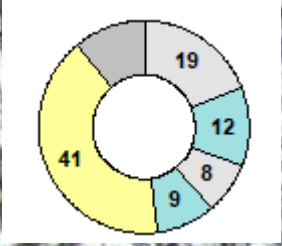


2020 – 3 bridges

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Let Them Rust – Then Replace?



Year Built –	1930
Year Last Painted –	1978
Poor Condition -	2008

SR 508 S Fork Newaukum River

Let Them Rust – Then Replace?

Year Built – 1930
Year Last Painted – 1978
Poor Condition - 2008
Load Posted - 2010/12



2010

2012

Let Them Rust – Then Replace?



Let Them Rust – Then Replace?



Let Them Rust – Then Replace?



2012



Let Them Rust – Then Replace?

Baily Bridge Installed in September 2015



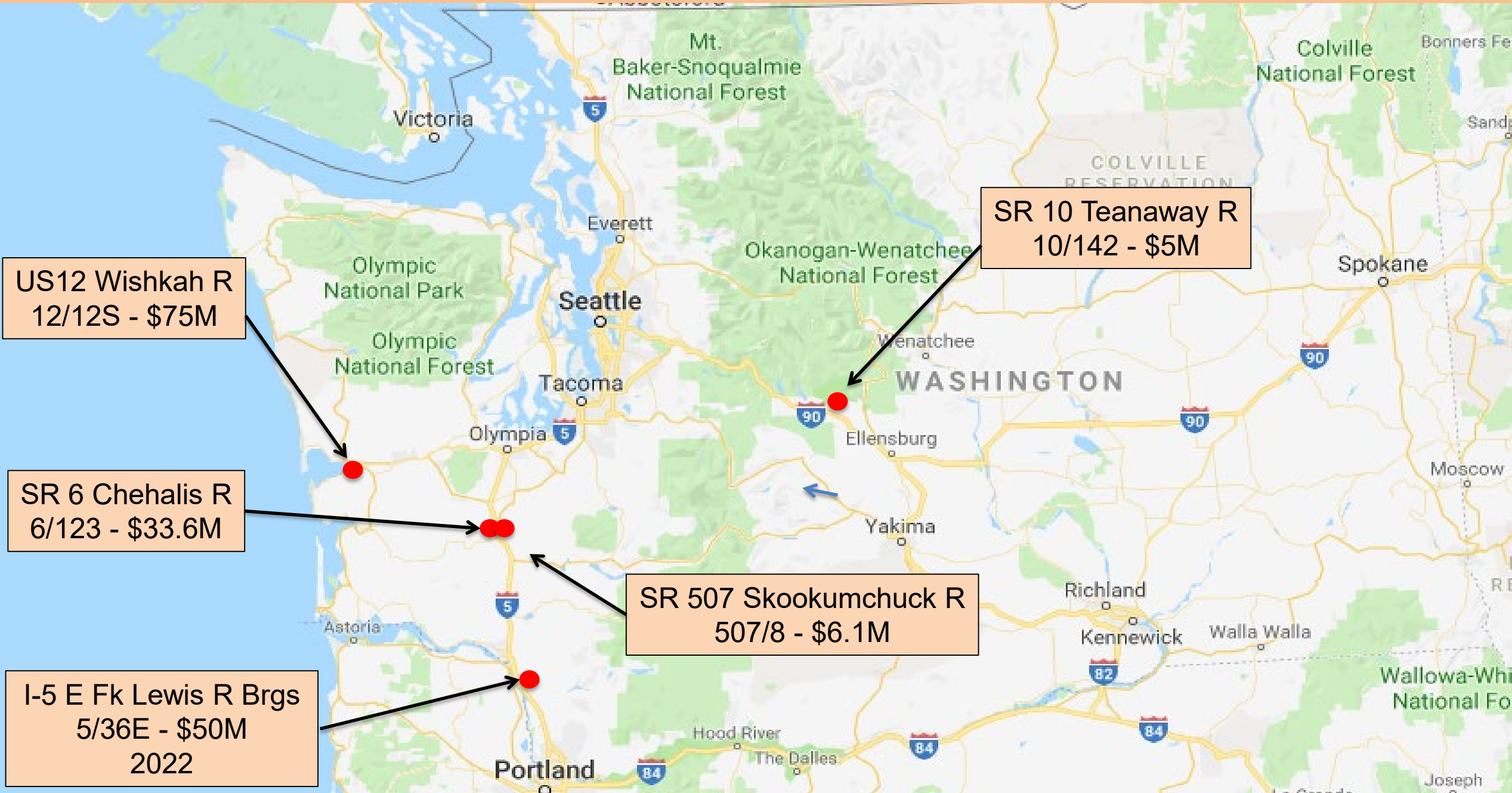
Let Them Rust – Then Replace?



New Bridge Open in April 2019

**Total Cost \$7.8M
(\$1,100 / SF)**

Let Them Rust – Then Replace?



Let Them Rust – Then Replace?

Year Built – 1940
Year Last Painted – 1988

2014 Age of Paint = 26 years



Action	Year	Cost \$
Planned Paint Year –	2014	\$1.0 M
<i>Do Nothing – Year “Poor” –</i>	<i>2020</i>	
Do Nothing Rehab Year -	2025	\$3.0 M
Do Nothing Replace Year –	2035	\$6.0 M

Let Them Rust – Then Replace?

2014 Paint Contract
Total Cost - \$1.0M

Year Built – 1940
Year Last Painted – 2014



Action	Year	Cost \$
Planned Paint Year –	2014	\$1.0 M
<i>Do Nothing – Year “Poor”</i>	2050	
Do Nothing Rehab Year -	2055	\$3.0 M
Do Nothing Replace Year –	2065	\$6.0 M

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Design and Construction



Design and Construction



Design and Construction



Design and Construction



Work Platform

Man Lift

Semi Truck

Man Lift

I-90 Columbia River bridge @ Vantage (Drone video Aug 2016)

Design and Construction



Design and Construction





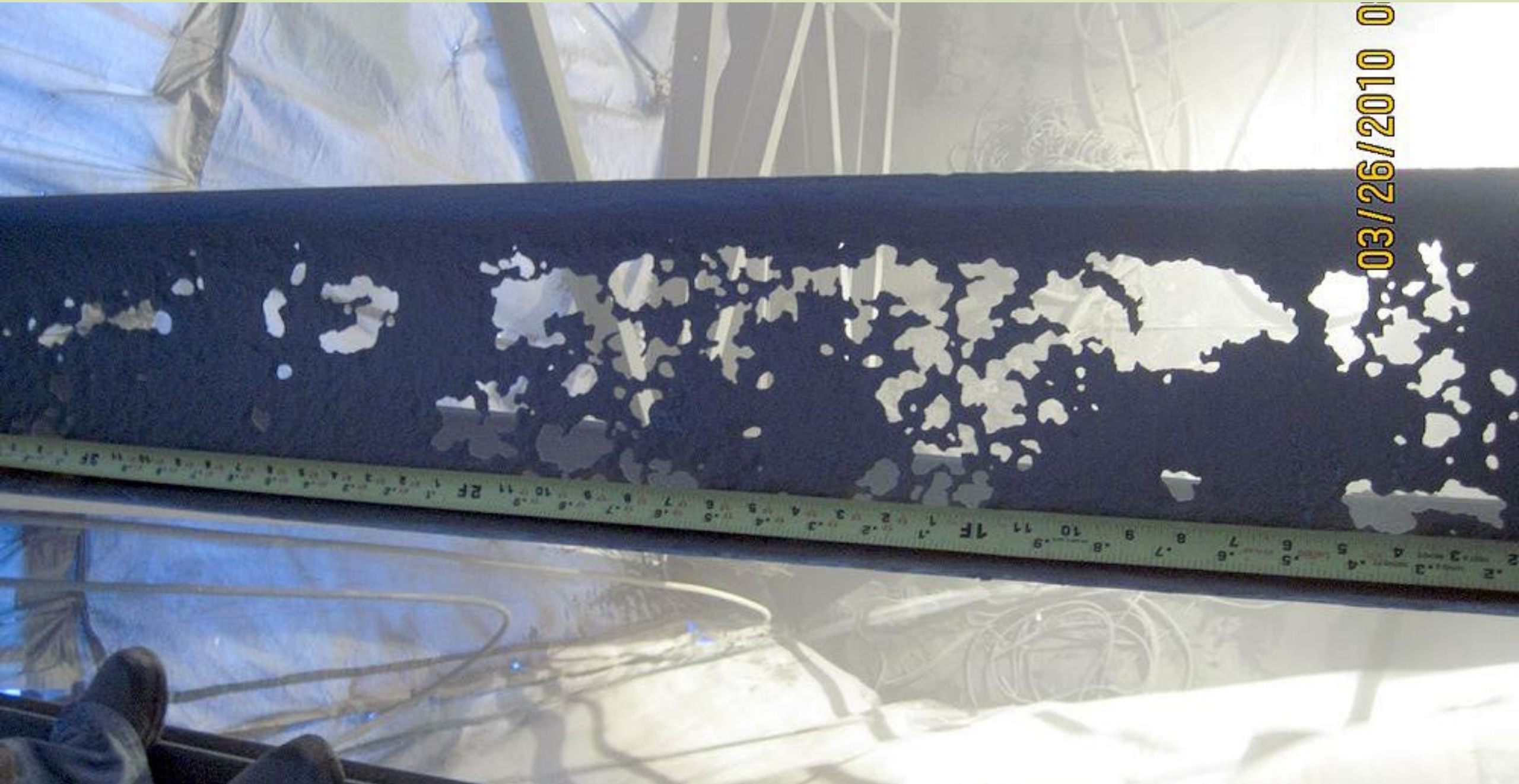
Design and Construction



Design and Construction



Design and Construction



03/26/2010 0

Agenda

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- Priorities
- Let them Rust and Replace?
- Current Projects
- Design and Construction
- **Maintenance Bridge Washing**
- Questions

Maintenance Bridge Washing



Maintenance Bridge Washing



Maintenance Bridge Washing



Maintenance Bridge Washing





12'-9"
CLEARANCE

WEIGHT
LIMIT
3
TONS

**BRIDGE
CLOSED**



Questions?

