Bridges & Emergency Management

Successes, Challenges, and Needs

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Island County Council of Governments Meeting

June 25, 2025

Introduction

- Bridge Condition
- Seismic Retrofit
- Seismic Lifeline
- Emergency Response
- Damage Assessments

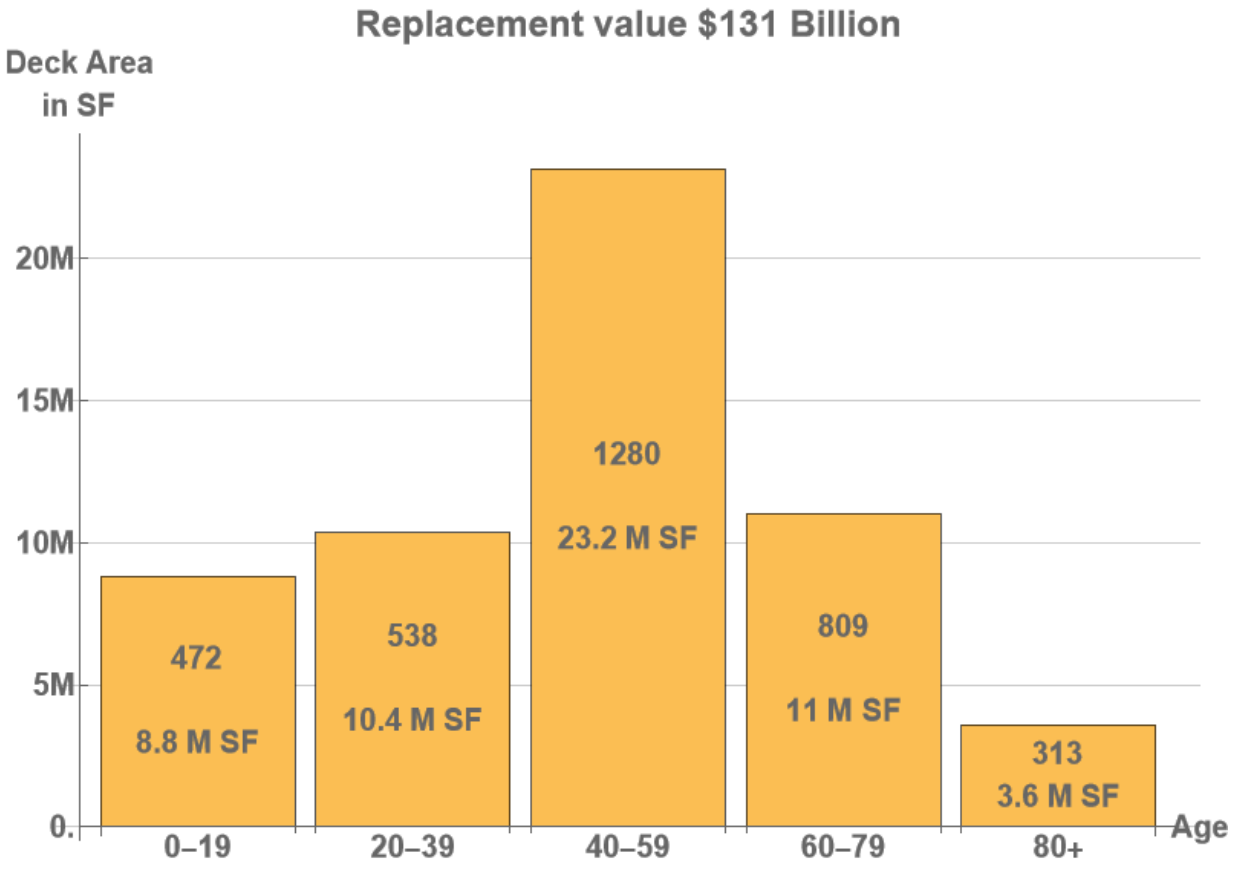
WSDOT Bridge Inventory

WSDOT's Aging Bridge Inventory

Total 3,412 bridges

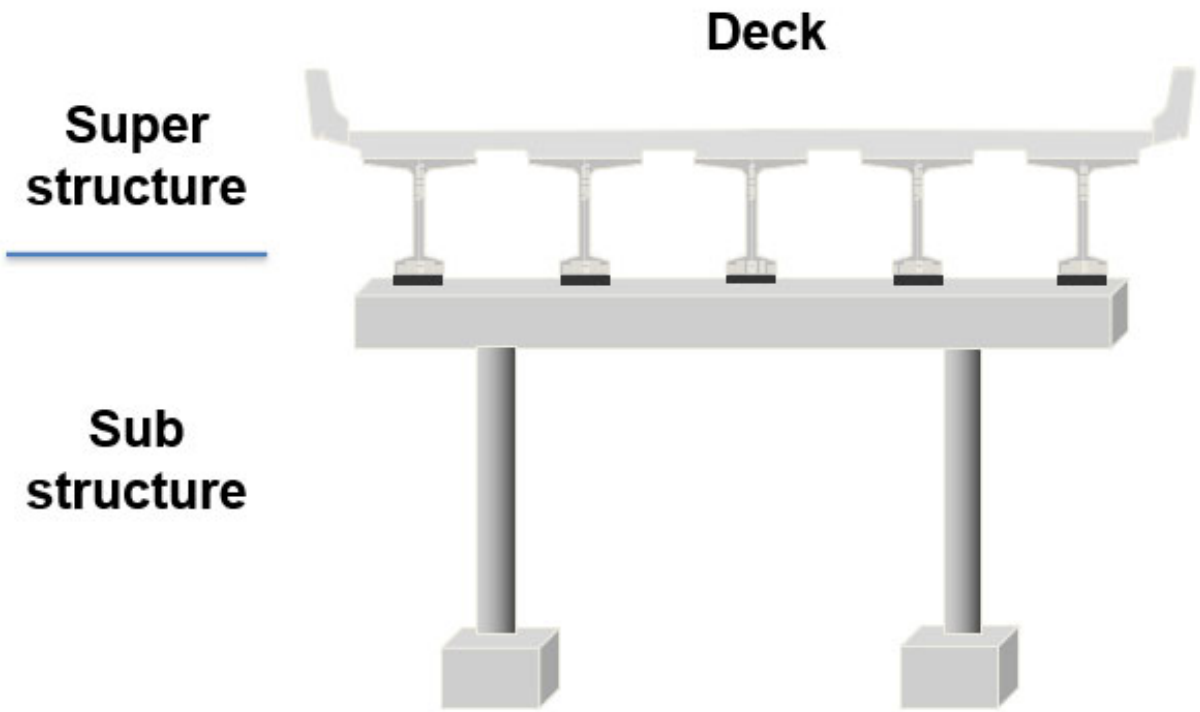
Average age: 51 years
Oldest: 1915

80+ yrs. old
313 bridges ($8.3 B)



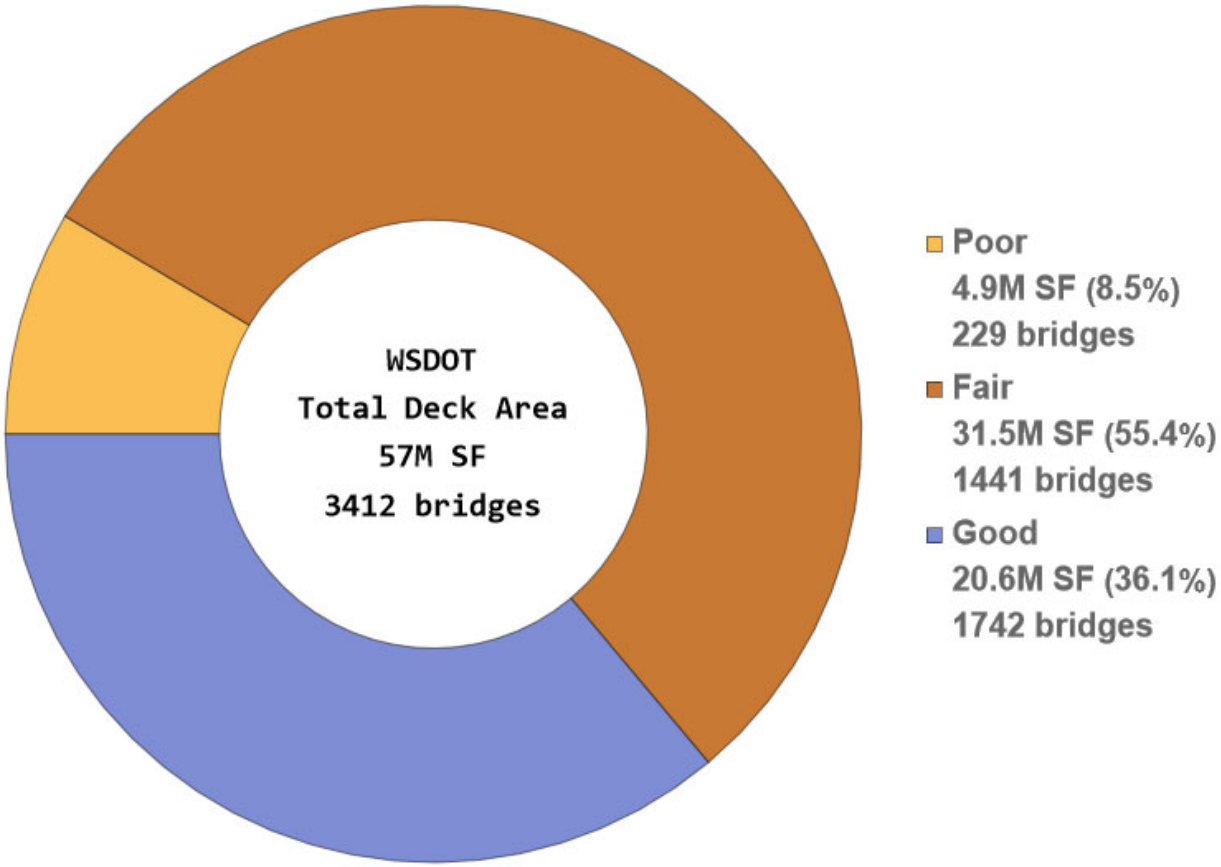
Data from June 2024

How We Measure Bridge Condition



Rating Code	
Good	8
	7
Fair	6
	5
Poor	4
	3
	2
	1
	0

Statewide WSDOT Bridge Condition



Data from June 2024

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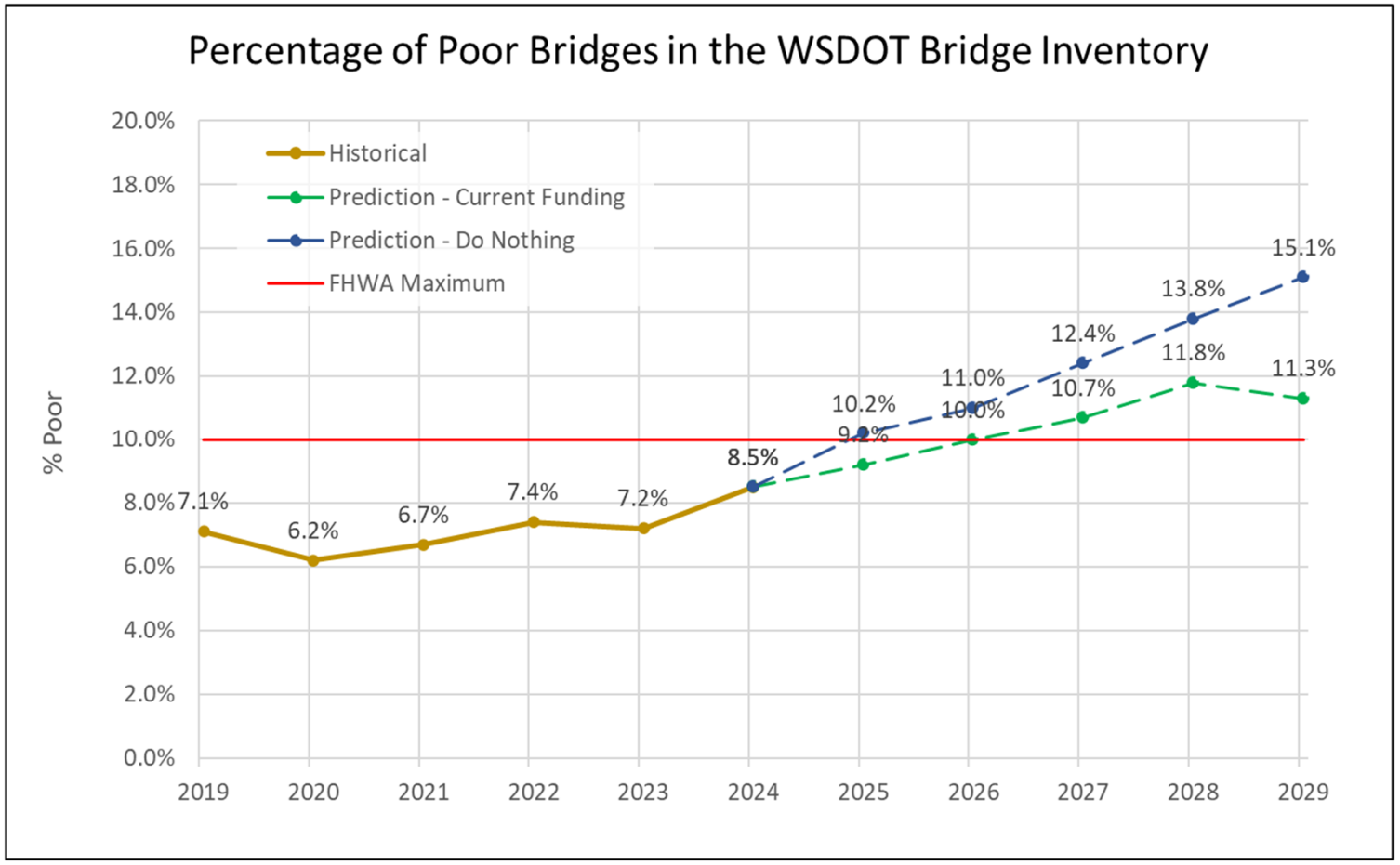
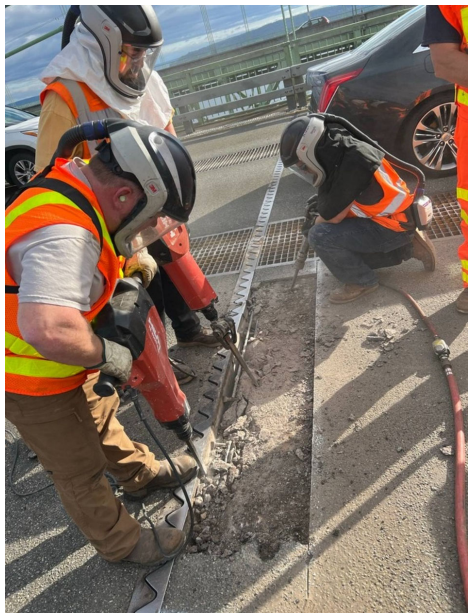
Condition Trends and Projections



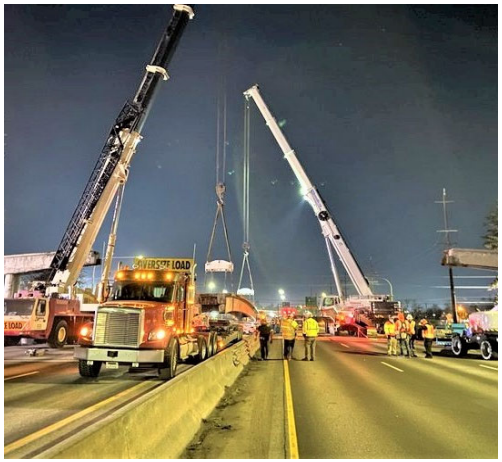
Condition Examples



1950 Tacoma Narrows
Bridge Deck / Joints

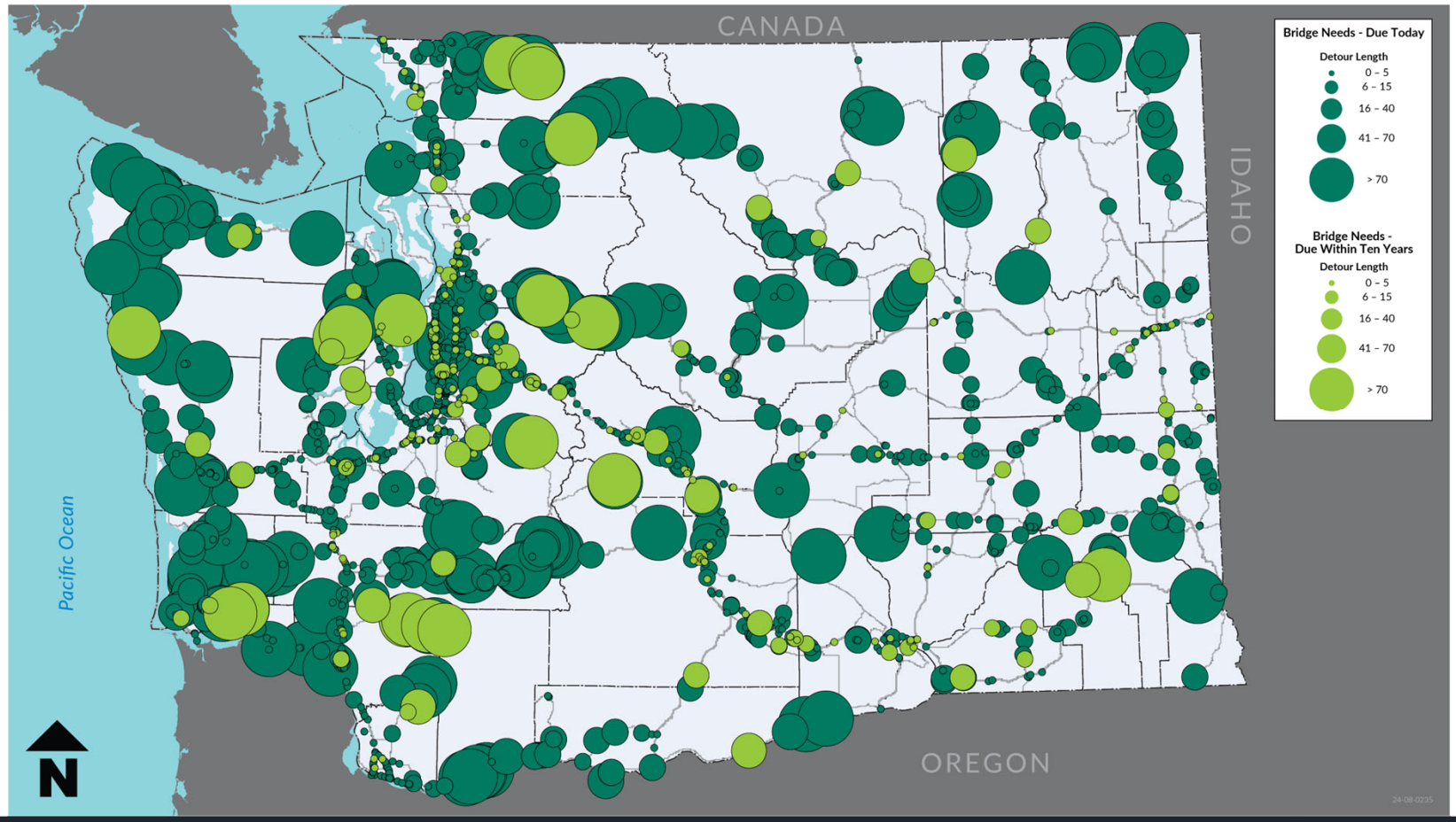
SR 165 Fairfax
Bridge Closure

I-5 Ship Canal Bridge
Deck Rehab



Spokane Ped Bridge
over I-90 – Closure

State Highway Bridge Preservation Needs



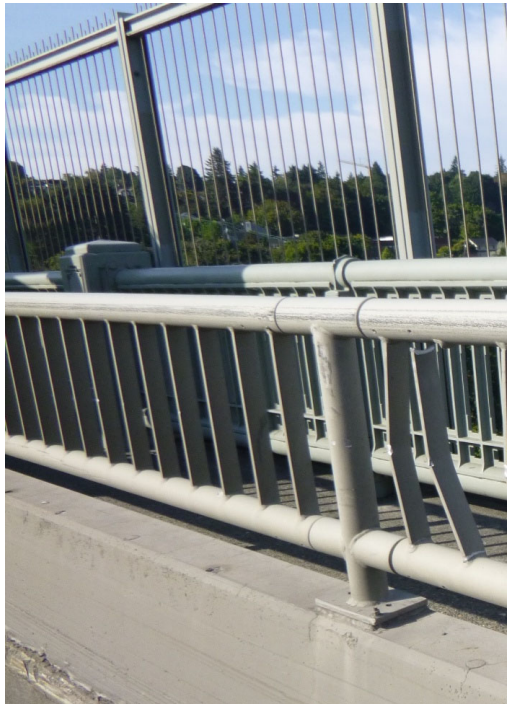
Deception & Canoe Pass Bridges

Condition

- Year Built 1935
- Steel Deck Truss, Concrete Approach Spans
- Fair, Poor
- Needs: Deck drain repairs, steel cracking, section loss
- Recent Project: 2020-21 Painting & Repairs
- Regular Washing

Upcoming Study

Current Rail



Example:
Aurora Ave, Seattle

Preservation Needs – Condition vs Risk

Condition

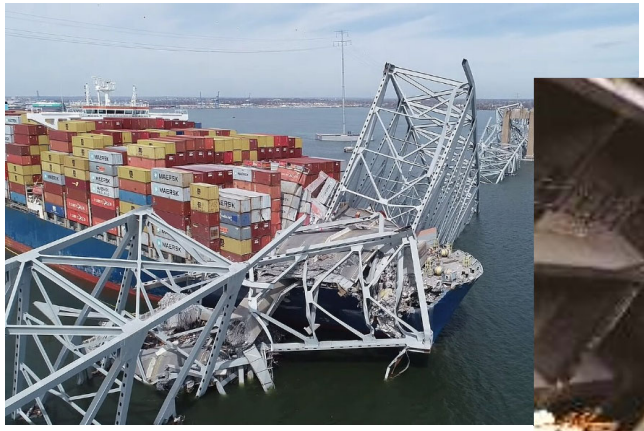
Operations

Probability = 1

Risk

Vessel Collision,
Seismic

Probability < 1

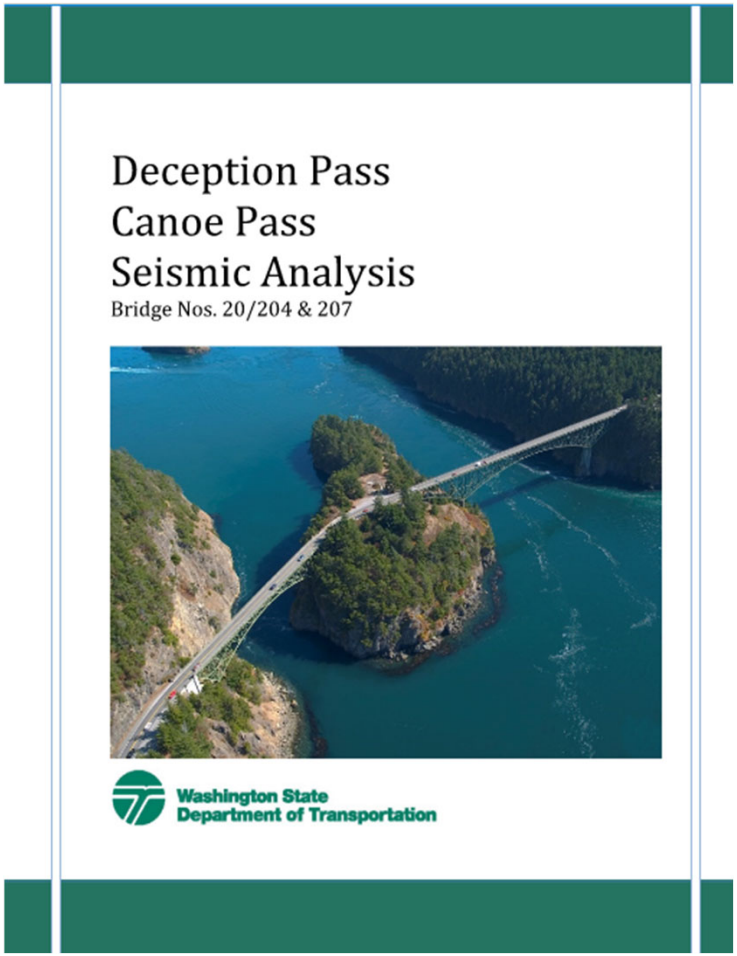


WSDOT Seismic Retrofit Program

Spent to date	>$100M
Bridges Identified	918
Bridges Completely Retrofitted	330
Bridges Still Needing Complete Retrofit	588
Have Been Partially Retrofitted	117

Deception & Canoe Pass Seismic Analysis

- July 2019 Analysis
- Structural Vulnerabilities Identified
- Retrofit Recommendations and Cost Estimate
- Retrofit Not Programmed

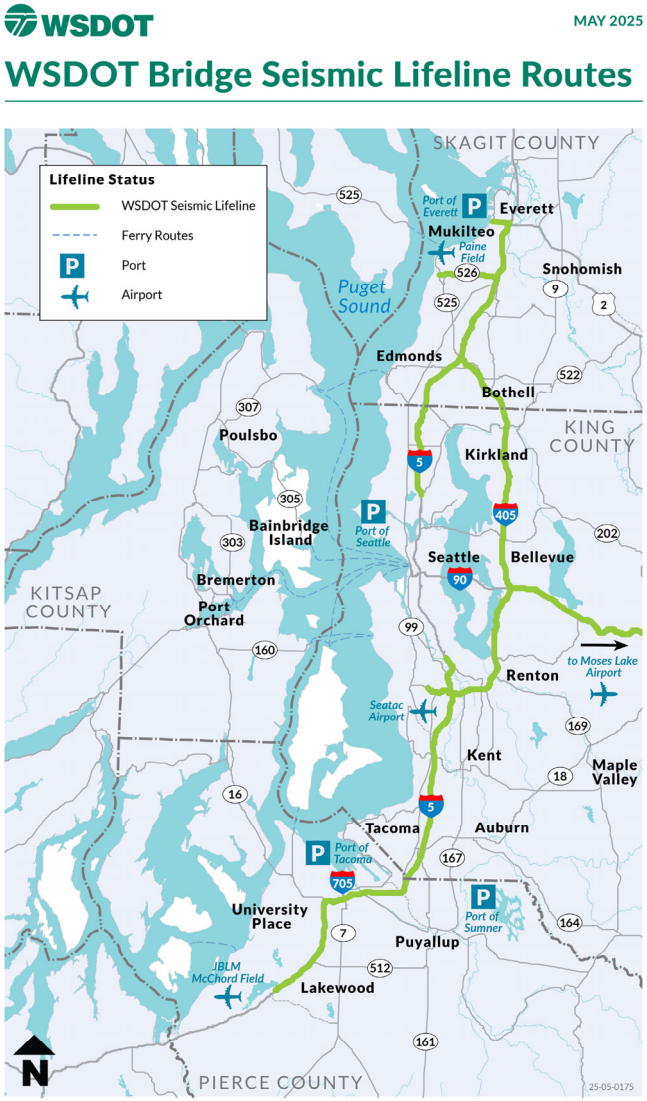


Seismic Lifeline

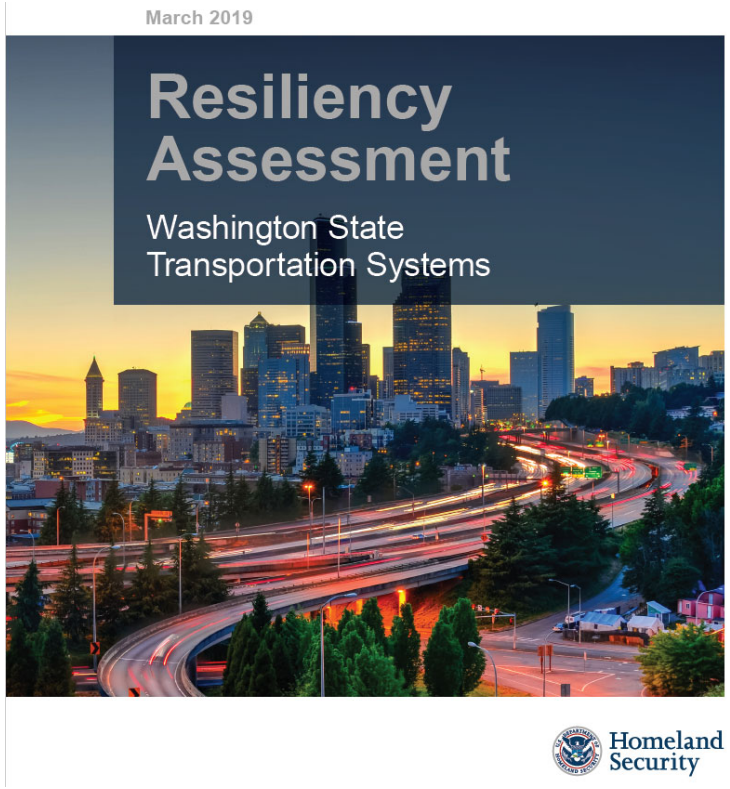
- Developed to connect federal distribution points
- Does not include I-5 through Seattle
- Provided funding to reinforce along the lifeline
- Only reinforced from ground up – does not account for liquefaction

Next Steps

- Expanding to locals – building the branches
- Unrealistic to expect full reinforcement statewide



RRAP General Information



- Regional Resiliency Assessment Program (RRAP)
- Undertaken by DHS with help from WA EMD and other partners
- Based on a M9.0 Cascadia Subduction Zone rupture
- Key outcome = identification of priority highway routes into Western Washington which can later support movement of resources into the areas of need.
  - Prioritized investment in highway routes to enhance seismic resilience prior to major earthquake to accelerate repair times.

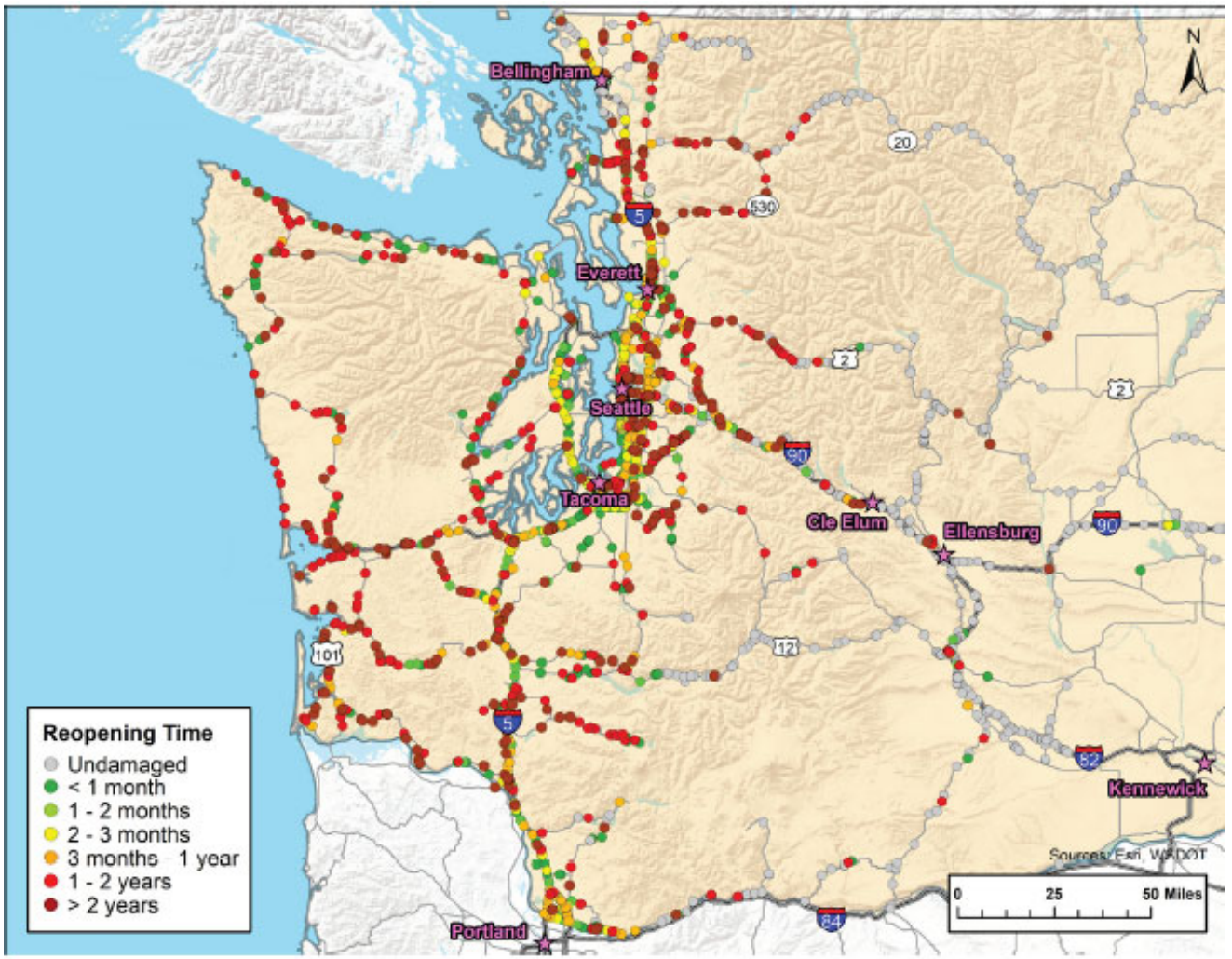


Figure 10: Bridge Seismic Screening Tool (BSST) Projected Reopening Times of Highway Bridges in Washington after the CSZ Scenario Earthquake

Table 2: Summary of Bridge Seismic Screening Tool (BSST) Projected Reopening Times of Highway Bridges in Washington after the CSZ Scenario Earthquake

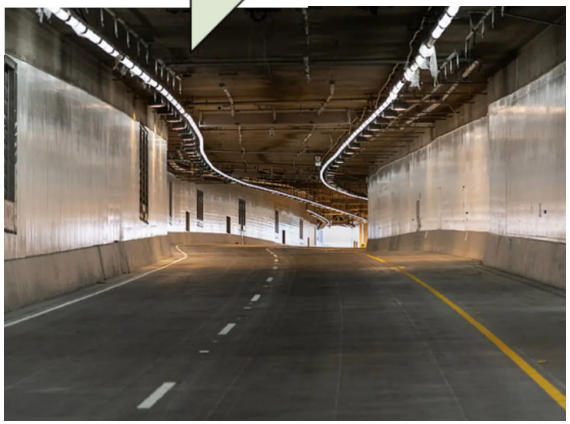
Reopening Time	Number of Bridges
None	621
1–14 days	317
2–4 weeks	46
1–3 months	627
3–6 months	165
6–12 months	159
1–1.5 years	304
1.5–2 years	120
2–2.5 years	352
> 2.5 years	6

Preliminary Damage Assessments

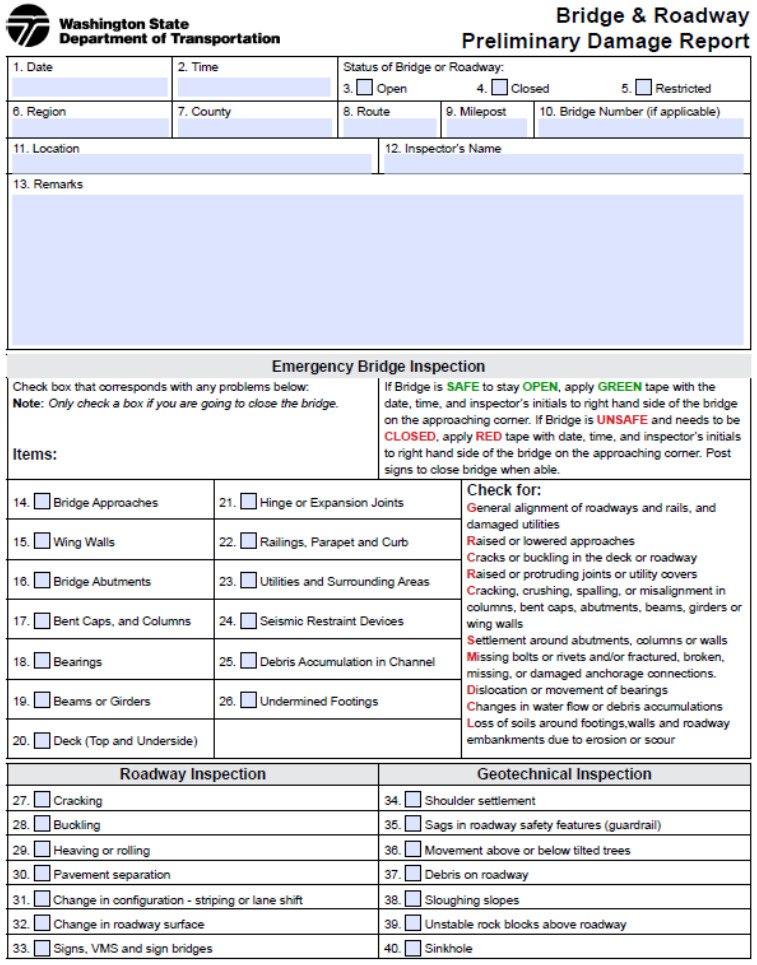
The Basics:

- System for conducting damage assessments
- 10-minute evaluation of bridges (NOT including specialty bridges)
- Includes roadway assessment
- Two-hour training annually
- Practice in Great ShakeOut
- Based on NCHRP guidelines

PDA Inspectors → Area Operations Center → Region EOC



Preliminary Damage Assessments



Washington State Department of Transportation

Bridge & Roadway Preliminary Damage Report

1. Date	2. Time	Status of Bridge or Roadway: 3. ☐ Open 4. ☐ Closed 5. ☐ Restricted		
6. Region	7. County	8. Route	9. Milepost	10. Bridge Number (if applicable)
11. Location		12. Inspector's Name		
13. Remarks				

Emergency Bridge Inspection

Check box that corresponds with any problems below:
Note: *Only check a box if you are going to close the bridge.*

Items:

If Bridge is **SAFE** to stay **OPEN**, apply **GREEN** tape with the date, time, and inspector's initials to right hand side of the bridge on the approaching corner. If Bridge is **UNSAFE** and needs to be **CLOSED**, apply **RED** tape with date, time, and inspector's initials to right hand side of the bridge on the approaching corner. Post signs to close bridge when able.

14. ☐ Bridge Approaches	21. ☐ Hinge or Expansion Joints	**Check for:** General alignment of roadways and rails, and damaged utilities Raised or lowered approaches Cracks or buckling in the deck or roadway Raised or protruding joints or utility covers Cracking, crushing, spalling, or misalignment in columns, bent caps, abutments, beams, girders or wing walls Settlement around abutments, columns or walls Missing bolts or rivets and/or fractured, broken, missing, or damaged anchorage connections. Dislocation or movement of bearings Changes in water flow or debris accumulations Loss of soils around footings,walls and roadway embankments due to erosion or scour
15. ☐ Wing Walls	22. ☐ Railings, Parapet and Curb	
16. ☐ Bridge Abutments	23. ☐ Utilities and Surrounding Areas	
17. ☐ Bent Caps, and Columns	24. ☐ Seismic Restraint Devices	
18. ☐ Bearings	25. ☐ Debris Accumulation in Channel	
19. ☐ Beams or Girders	26. ☐ Undermined Footings	
20. ☐ Deck (Top and Underside)		

Roadway Inspection	Geotechnical Inspection
27. ☐ Cracking	34. ☐ Shoulder settlement
28. ☐ Buckling	35. ☐ Sags in roadway safety features (guardrail)
29. ☐ Heaving or rolling	36. ☐ Movement above or below tilted trees
30. ☐ Pavement separation	37. ☐ Debris on roadway
31. ☐ Change in configuration - striping or lane shift	38. ☐ Sloughing slopes
32. ☐ Change in roadway surface	39. ☐ Unstable rock blocks above roadway
33. ☐ Signs, VMS and sign bridges	40. ☐ Sinkhole

Who we train:

- As many WSDOT personnel as we can!

How we train:

- Online via Teams

Where we want to go:

- More training
- Expand to locals
- Developing a Seismic Interoperability Plan

Form link:

DOT Form 580-020 Bridge & Roadway Preliminary Damage Report

Emergency Repairs

Questions?

For additional information, please contact:

WSDOT Bridges – Evan Grimm, Evan.Grimm@wsdot.wa.gov

Emergency Management – Kayla Grayson, Kayla.Grayson@wsdot.wa.gov