3.1.a: Based on current funding levels, control the percent of state and local bridges in poor condition from increasing over 10% by 2017 - Supplemental Report

3.2.A: BRIDGE CONDITIONS

Department of Transportation

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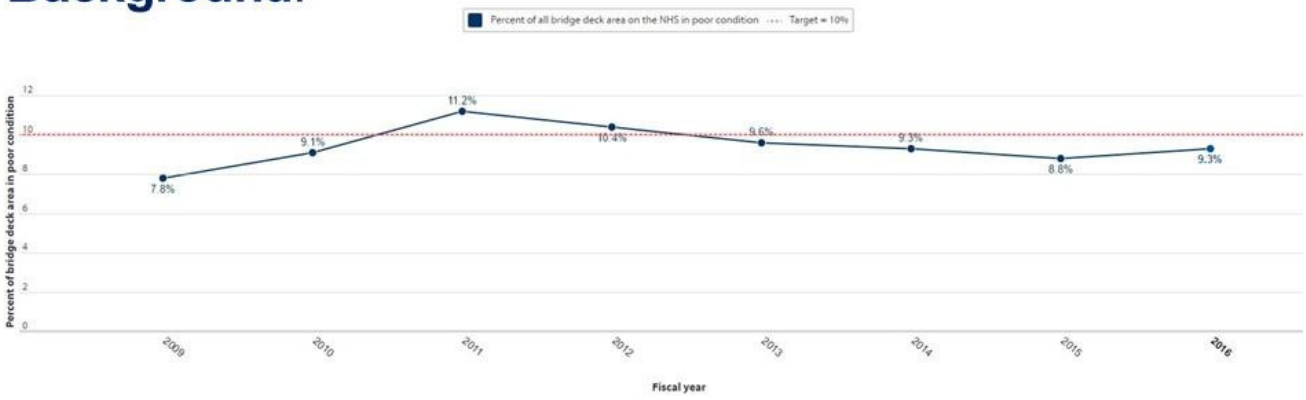
Background:



Bridges and the economy:

- Bridges are crucial to freight movement by truck
  - Trucks move 64% by weight and 59% by value of all freight into, out of, within, and through Washington
  - Freight movement relies on bridges at 3400 locations across Washington

Background:

Bridges and the economy:

- I-5 Skagit River bridge collapse
  - I-5 is a major arterial for freight crossing the Canadian border
    - Fourth-busiest land port of entry on the northern US border in 2015
    - Goods moving over the bridge in 2012 valued at $14 billion
  - Estimated direct cost from road users was estimated at $8.3 million
  - Average weekday truck volume on the bridge prior to the collapse was 9,253; average weekday truck volume on the three detour routes after the collapse and before the temporary bridge replacement was 7,334

Total Direct Cost Estimates			
	Main - A	**Alternative - B**	**Bypass - C**
Total per day road-user costs associated with each detour	$101,940 weekday	$33,977 weekday	$24,952 weekday
	$85,845 weekend	$41,347 weekend	$25,281 weekend
Estimated per day road-user costs for unmeasured traffic displaced from I-5 but not using three official detours	$159,146 weekday		
	$168,064 weekend day		
Total direct cost per day	$320,015 weekday		
	$320,537 weekend day		
Costs Associated with Entire Duration of Bridge Closure			
Total direct cost for 17 weekdays	$5,440,255		
Total direct cost for 9 weekend days	$2,884,833		
Total direct cost	**$8,325,088**		

Current State: *Goal met!*

Washington achieves goal of keeping structurally deficient bridge deck area below 10% statewide
As of June 2016; Percent of bridge deck area considered structurally deficient (SD); Deck area in millions of square feet

	National Highway System		Statewide	
	Deck area[1]	Number of bridges	Deck area[1]	Number of bridges
WSDOT owned	44.4	2,259	53.5	3,294
Amount SD (%)	*4.1 (9.2%)*	*99*	*4.7 (8.8%)*	*154*
Locally owned[2]	4.6	189	17.8	4,041
Amount SD (%)	*0.5 (10.0%)*	*19*	*1.2 (7.0%)*	*188*
Total	49.0	2,448	71.3	7,335
Amount SD (%)	*4.6 (9.3%)*	*118*	*5.9 (8.3%)*	*342*

Data source: WSDOT Bridge and Structures Office and WSDOT Local Programs Office.
Notes: Structurally deficient is equal to the state's poor condition rating. 1 Due to rounding, some percentages are not computable based on numbers in the table. 2 Bridges owned by counties and cities.

- In 2016, 9.2% of WSDOT owned bridges by deck area and 10.0% of locally owned bridges by deck area on the National Highway System are in poor condition, or structurally deficient*
- Combined, 9.3% of NHS bridges by deck area are in poor condition
- Both WSDOT owned and locally owned bridges by deck area in poor condition is higher than in 2015

*Poor condition, or structurally deficient, does not mean the bridge is unsafe; it indicates that one or more components requires repair or preservation

WSDOT Problem/Opportunity:

Preservation needs:

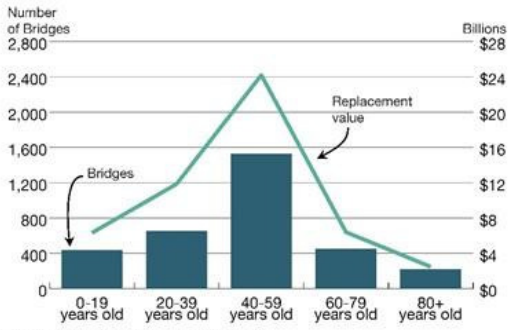
- Current 10-year need for bridge preservation activities is estimated at $2.7 billion

Concrete bridge deck preservation will be WSDOT's largest bridge need in the next 10 years
2016 through 2026; Dollars in millions

Category	Current needs	Predicted additional needs	Total 10-year needs
Border bridge preservation[1]	$81.2	N/A[2]	$81.2
Bridge element repairs	$26.5	$85.9	$112.4
Expansion joint preservation[3]	$250.5	$155.2	$405.7
Movable bridge preservation[3]	$39.6	N/A[2]	$39.6
Concrete deck preservation	$115.6	$726.5	$842.1
Steel painting	$414.5	$292.1	$706.6
Bridge rehab or replacement	$255.7	$227.8	$483.5
Bridge scour	$9.5	$20.0	$29.5
Total	**$1,193.1**	**$1,507.5**	**$2,700.6**

Data source: WSDOT Bridges and Structures Office.
Notes: 1 Border bridge preservation is the highest funding priority and includes work from other preservation categories in the table. 2 N/A = Not applicable; the predicted additional preservation need has not been defined. 3 Categories are separate to highlight specific bridge element repairs.

Replacing WSDOT's 223 bridges that are 80 years or older would cost $2.5 billion over the next 20 years
As of June 2016; Number of bridges by age; Replacement value in billions of dollars



Data source: WSDOT Bridge and Structures Office.
Notes: The graph shows WSDOT-owned bridges only. Replacement value describes the cost to replace all bridges in each age range.

Aging structures:

- The estimated average cost to replace a bridge over 80 years old is approximately $11 million.
- Even as some 80+ year old bridges are replaced, others are aging into this category

WSDOT Problem/Opportunity:

Connecting Washington opportunities:

- $1.2 billion is allocated to state highway preservation, which includes pavement, bridges and traffic operations
- Three bridge preservation projects have been identified for funding from the revenue package
- Funding will help address the most critical needs for bridges

Connecting Washington challenges:

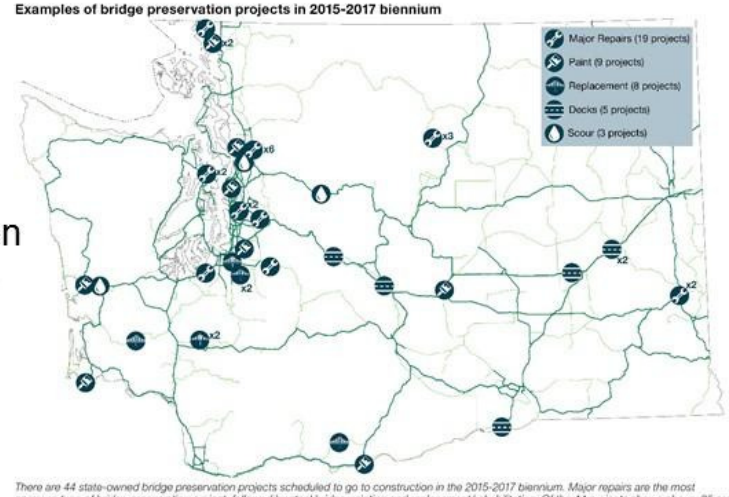
- Funding will not clear WSDOT's list of structurally deficient (poor condition) bridges
  - Funding should allow WSDOT to maintain the number of structurally deficient bridges at or under 10% for some time
- Available funding does not cover the projected 10-year preservation needs gap

WSDOT Strategies:

Cost effective techniques:

- Strategic preservation activities
  - Repainting steel bridges maintains fair or good condition
  - Replacing deteriorated bridge elements (anchor cables, expansion joints) extends bridge service life

Examples of bridge preservation projects in 2015-2017 biennium



There are 44 state-owned bridge preservation projects scheduled to go to construction in the 2015-2017 biennium. Major repairs are the most common type of bridge preservation project, followed by steel bridge painting and replacement/rehabilitation. Of the 44 projects shown above, 35 are for bridges on the National Highway System (NHS) and 25 are for bridges currently classified as structurally deficient (18 projects are on bridges that are both structurally deficient and on the NHS).

- Practical design tools
  - Lower cost solutions that produce the best ROI
  - Ex: Instead of replacing a deteriorated bridge deck, WSDOT may choose to repair it and add a concrete overlay to extend its service life at a lower cost

Local Program Problem/Opportunity:

Local resources:

- Local transportation agencies may not have the necessary resources to complete all aspects of a bridge project
  - Bridge design
  - Site inspection
  - Environmental testing
  - Troubleshooting unforeseen delays

Available funding:

- Limited funding is available to support the preservation needs of local agencies
  - Funding is applied statewide based on data-driven performance

Local Program Strategies:

Local Federal Bridge Program:

- Helps local agencies comply with state and federal performance metrics
  - Provide resources needed at the local level to complete projects
  - Eligible projects selected by the program will be awarded funds in fall 2017
- Bridge Replacement Advisory Committee
  - Provides advice and recommendations to WSDOT's Local Programs Director to help inform the selection of local bridge projects for funding
  - Made up of representatives from cities and counties with a WSDOT committee chair.
- More than $70 million was awarded for 32 local agency bridge projects in 2014

Assistance Needed:

- Communication to communities
  - Long-term projects have long-term benefits
- Advocacy
  - For bridge maintenance and preservation needs
  - Support for local project delivery

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