

WSDOT Bridge Preservation Program

February 6, 2008



Structure Preservation Programs

- Special Repair
 - Major Repair
 - Moveable Bridge Repair
- Steel Bridge Painting
- Bridge Deck Preservation
- Bridge Rehab / Replacement
 - Structural Deficiencies
- Seismic Strengthening
- Scour Protection
- Miscellaneous Structures



Interstate 5 Lewis River Bridge, La Center



Hood Canal Bridge – Pontoon Constr., Tacoma

Steel Bridge Painting

- WSDOT has painted 4 steel bridges over the last three years at a cost of \$7.0 million.

Recently completed projects include:

- SR 99 Duwamish River bridge, Seattle
- Portion of SR433 Lewis and Clark , Longview

- Current backlog of 61 bridges for approximate cost of \$150 million. Top priorities include:

- SR 16 Tacoma Narrows Suspender Cables
- SR 433 Lewis & Clark Bridge, Longview
- SR 99 Aurora Ave , Seattle
- I-5 Lewis River Bridges, LaCenter

- There are 4 Steel “Border Bridges” between Oregon and Washington over the Columbia River. These require painting for an approximate cost of \$51 million (out of the \$150 million) to be shared equally.

They are:

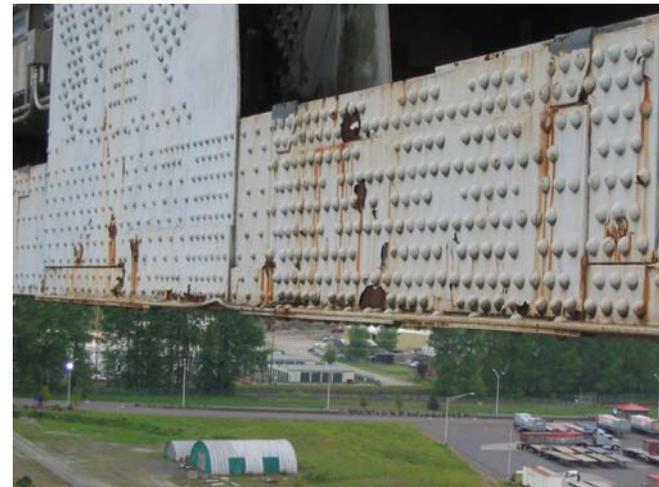
- US 101 Astoria Bridge , Astoria Or
- SR 433 Lewis & Clark Bridge, Longview
- US 97 Sam Hill Memorial Br , Goldendale vic
- I-82 Col R @ Umatilla , Umatilla Or

- *Proposed WSDOT* budget assumes \$18 million in the 2009-11 bien and \$30 million in the following biennium’s.

****Emerging Issue**** Cost of Painting bridges is likely to increase 200-300% in some cases as more bridges will require removal of all the existing paint to “Bare Metal” verses “Overcoating” .



US 97 Sam Hill Memorial Br , Goldendale vic



SR433 Lewis and Clark Br (Truss - bottom chord)

Major Repairs

- WSDOT repaired 5 bridges in the 2005-07 biennium for a cost of \$3.2 million.
- WSDOT is scheduled to repair 22 bridges in the 2007-09 biennium at a cost of \$10.5 million.

Recently completed projects include:

- I-5 SB Bridge 5/539E Exp Joints, Seattle
- SR 109 Grass Creek Bridge Repair, Ocean City
- I-5 Lewis River Bridge Truss Repair, LaCenter

- Most recent condition assessment is that 105 bridge elements will need rehabilitation in the next 8 years at an estimated cost of \$73 million (in current dollars).

Top priorities include:

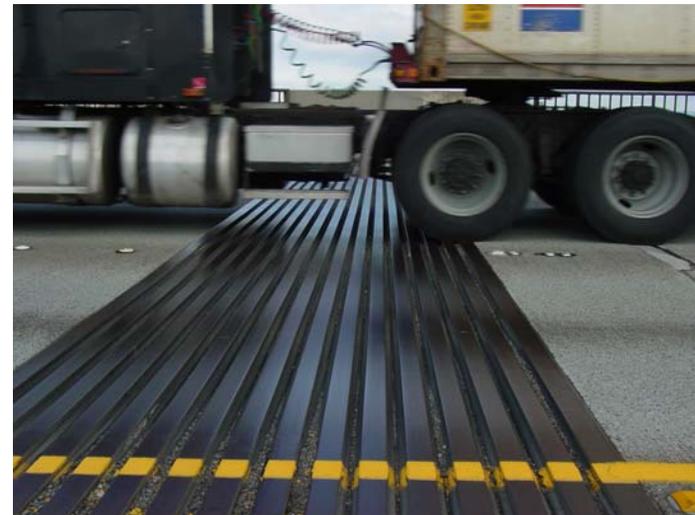
- I-90 Homer Hadley Bridge – Exp Joints and Anchor Cables, Seattle
- SR 520 Evergreen Pt – Anchor Cables, Seattle
- I-5 Nisqually River – Repair fatigue cracks in steel truss, Nisqually Area

- *Proposed WSDOT* budget assumes \$12.5 million in the 2009-11 bien and \$20 million in the following biennia.

****Emerging Issue**** The three Lake Washington bridges have anchor cables in need of replacement. I-90 Homer Hadley – 23 cables , I-90 Lacey V Murrow – 9 cables , SR 520 Evergreen Pt – 20 cables.



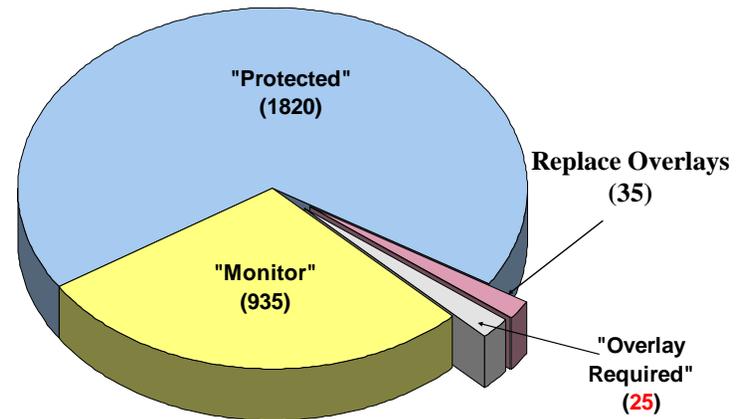
SR 520 Floating bridge – Anchor Cable



I-90 Homer Hadley Floating Br – Replace Modular Exp Jnt.

Bridge Deck Preservation

- WSDOT concrete deck overlay program began in the mid 1980s. A significant number of bridge decks are “protected” against winter de-icing salts. Protective overlays are required on those identified with deck deterioration.
- WSDOT rehabilitated x concrete bridge decks over the past 3 years for a cost of \$4.7 million. The department also repaired and overlaid the I-5 NB Viaduct bridge in Seattle in 2007 for \$14.3 million and completed the I-90 Spokane Viaduct in Spokane for \$14.0 million.
- Recently completed projects include:
 - I-5 Northbound Bridge, Seattle (\$14.3 million-TPA)
 - I-90 Spokane Viaduct, Spokane (\$14.0 million)
 - US 12 Snake River, Clarkston (\$2.4 million)
- Most recent condition assessment is that 60 bridge decks will need rehabilitation in the next ten years at an estimated cost of \$70 million (in current dollars).
Top Priorities include:
 - US 97 Okanogan R, Omak vic
 - I-90 Medical Lake Rd brgs, Cheney
 - I-5 Clover Creek, Lakewood
- *Proposed WSDOT* budget assumes \$10 million in the 2009-11 bien and \$15 million in following biennia.



Note: WSDOT Bridges with concrete decks = 2,815



I-90 Medical Lake Rd OC (mp 269.87) , Cheney Vic

Bridge Replacement / Rehabilitation

- The SR104 Hood Canal Bridge is the highest funded Bridge Preservation project (\$122.5 million in the 2005-07 bien and \$139.9 million in the 2007-09 bien).
- Over the last three years WSDOT has replaced / Rehabilitated 3 bridges with Br Preservation funds (excluding Hood Canal) at a cost of \$8.8 million. Recently completed projects include:
 - SR 240 Yakima River, Richland
 - US 12 Coppei Creek bridge , Waitsburg
 - US 2 Ebey Island Viaduct – stage1, Everett
- The Bridge Office has prioritized 35 bridges in need replacement or major rehabilitation, with a projected cost of approximately \$547 million (in current dollars). Top priorities include:
 - US 2 Ebey Island Viaduct – stage 2 and 3, Everett
 - SR 97 Satus Creek, Toppenish
 - SR 303 Manette, Bremerton
 - SR 167 Puyallup River, Puyallup
 - SR 107 Slough Bridges, Montesano
- The 2005 TPA identified 25 bridges statewide to be replaced over the next 10 years with estimated expenditures in the 2007-09 bien and beyond of \$276 million.
- *Current WSDOT* budget assumes \$68 million per biennium (excl TPA) in order to continue replacement and Rehabilitation of State Owned bridges.

****Note**** Proposed Bridge Replacement plan does not include 73 Timber bridges with an estimated replacement cost of \$439.2 million.



SR 303 Manette Bridge, Bremerton



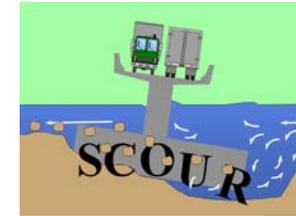
US 2 Ebey Island Viaduct Rehab., Everett

Bridge Foundation Scour Protection

- WSDOT has mitigated scour on 9 bridges over the last three years for a cost of \$2.6 million.
- WSDOT has over 1,500 bridges over water with 319 bridges categorized as being “scour critical”. Of these, 20 bridges have been prioritized for scour repair.

The top five are:

- US 101 Humptulips R, near Humptulips
 - SR 9 Thunder Ck, near Burlington
 - SR 20 Coal Ck, near Burlington
 - US 12 Touchet River near Touchet
 - SR 107 Chehalis R near Montesano
- Future project costs are difficult to estimate because of increasingly stringent environmental permit requirements for in-stream work. Current estimate for scour protection for 20 bridges is \$14.8 million (in current dollars).
 - *Current WSDOT* budget assumes \$4 million per biennium to address scour needs.



The term “Scour Critical” is used to categorize bridge foundations in water where supporting material could be washed out by a river flood event. Evaluations are based on Nationally recognized procedures. Bridge Engineers have reviewed all the “Scour Critical” bridge information and prioritized the top 20 candidates.



US 101 Humptulips River bridge, Humptulips

Movable Bridge Repair

- WSDOT has 16 Movable bridges and shares ownership of 3 others (I-5 Col R brgs with Oregon and US 12 Snake R @ Clarkston with Idaho).
- Recent projects include:
 - US 101 Simpson Ave , near Hoquiam (under construction)
 - SR 529 Steamboat Slough, near Marysville
 - I-5 Columbia River Bridge, in Vancouver
- The US 101 Simpson Ave bridge is under contract and has expenditures in the 2007-09 bien of \$11.1 million.
- One remaining major projects is:
 - US 101 Hoquiam River at Riverside (\$6.1 million)
- *Current WSDOT* budget assumes \$5 million per biennium in order to continue rehabilitation and upgrade of all state owned moveable bridge electrical and mechanical systems.



US 101 – Hoquiam R / Simpson Ave near Hoquiam



US 101 – Hoquiam River / Riverside near Hoquiam

Miscellaneous Structures

- Misc Structures Include:
 - Tunnels
 - Sign Structures
 - Bridges less than 20 feet in length
 - Pedestrian bridges
 - Retaining Walls
 - High Mast Luminaries

- WSDOT expended \$1.7 million in the 2005-07 biennium on Misc Structures.
Recent projects include:
 - US 97 Knapps Hill Tunnel (stage 3) near Chelan
 - I-5 NC Region Sign Structures



SR 14 Tunnel (with Ice) near Lyle

- WSDOT has Identified 21 Misc Structures that need to be replaced or repaired.
Projects include:
 - SR 14 Tunnel near Lyle
 - I-5 Downtown Seattle Sign Structures (4)
 - US 97 Knapps Hill Tunnel (stage 4) near Chelan
 - SR 142 Creek Culvert @ M.P.23.58 near Goldendale

- *Proposed WSDOT* budget assumes \$2 million per bien to address future Misc Structures Needs.

WSDOT - Statewide Numbers

<u>Category</u>	<u>Number</u>
Structures < 20 ft	325
Culverts > 20 ft	89
Pedestrian Brgs	59
Tunnels and Lids	39
Sign Bridges	821
Cantilever Sign Structure	863
Retaining Walls	NA
High Mast Luminaries	164

Bridge Seismic Strengthening

- WSDOT has completed seismic strengthening on 17 bridges over the last three years for a cost of \$11 million.
- Recently completed projects include:
 - US 2 Snohomish R Bridge, Everett
 - SR 99 Spokane Street, Seattle
- Where are we? (since 1980)
 - 210 bridges have been completed.
 - 150 bridge partially complete.
 - 527 no work to date.
 - 677 Remaining (150 + 527)
 - 26 under Contract
 - 8 Analysis determine Retrofit not Required
- *The 2005 TPA* provided \$87 million to complete 172 “High” and “Moderate” risk structures in the Puget Sound Region over the next 8 years.
- Assume a budget of \$10 million per biennium (using Pre-existing funds) to perform Seismic Retrofit work apart from the TPA funded program.



SR 99 Spokane Street Overcrossing in Seattle



SR 99 Aurora Ave Br (stage 3) - Approaches

WSDOT Bridge Office Proposed Preservation Budget

(does not include Engineering and Direct Project Support costs)

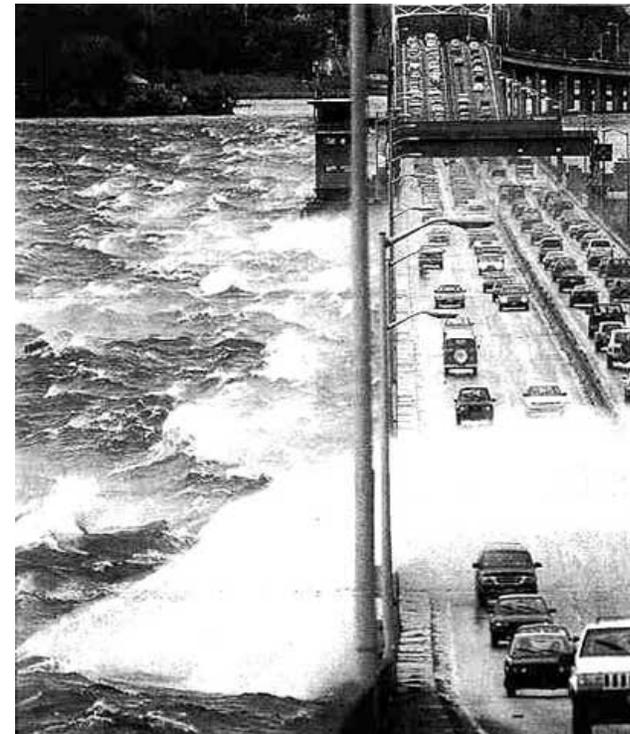
Strategy	2007-09 Bien\$	2009-11 Bien\$	2011-13 Bien\$	2013-15 Bien\$	2015-17 Bien\$	Totals
Scour Mitigation	\$2.8	\$4.0	\$4.0	\$4.0	\$4.0	\$18.8
Special Repair (Essential Repairs)	\$12.4	\$12.5	\$20.0	\$20.0	\$20.0	\$84.9
Bridge Painting	\$16.4	\$18.0	\$30.0	\$30.0	\$30.0	\$124.4
Bridge Deck Rehabilitation	\$21.3	\$10.0	\$15.0	\$15.0	\$15.0	\$76.3
Movable Bridge Rehabilitation	\$11.4	\$5.0	\$5.0	\$5.0	\$5.0	\$31.4
Bridge Rehabilitation / Replacement	\$50.0	\$68.0	\$68.0	\$68.0	\$68.0	\$322.0
Miscellaneous Structures	\$1.9	\$2.0	\$2.0	\$2.0	\$2.0	\$9.9
Seismic Retrofit (Critical Structures)	\$12.0	\$10.0	\$10.0	\$10.0	\$10.0	\$52.0
Clean Bridges	\$0.0	\$1.0	\$1.0	\$1.0	\$1.0	\$4.0
	<u>\$128.2</u>	<u>\$130.5</u>	<u>\$155.0</u>	<u>\$155.0</u>	<u>\$155.0</u>	\$723.7

What is Not Included?

- SR 99 Alaskan Way
- SR 520 Evergreen Point Floating Bridge



Alaskan Way

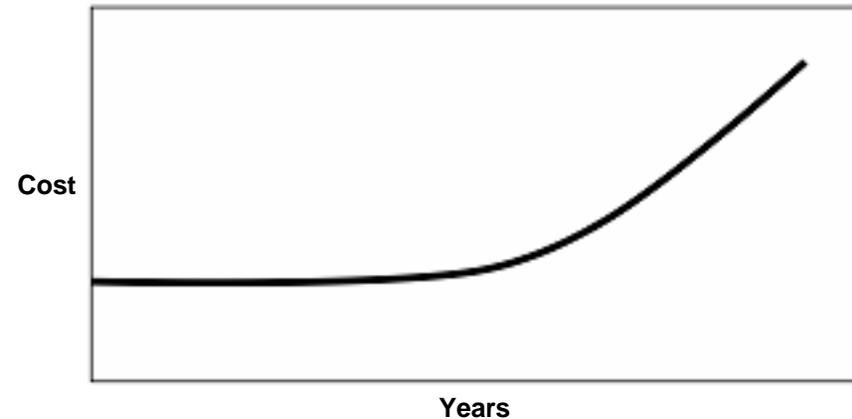


Evergreen Point Floating Bridge

Significant Issues in System Preservation

- Preservation investment needs tend to increase as the asset inventory grows older.
- Neglect or deferral of preservation investment leads to compromise or loss of use of existing assets. This leads, in turn, to spiraling costs to retain or recapture existing facilities and capacity.
- Preservation investment is becoming more expensive and complicated
- Basic current expense maintenance activities must also be funded if there is to be a sound foundation for stewardship of existing assets.

“Pay me now, or pay me more - lots more - later”



Two Points to Take Away...

- **Bridge Preservation needs are larger than you thought and very compelling.**
- **Funding is falling short of meeting preservation needs.**