Washington State
Department of Transportation

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The Gray Notebook

WSDOT's quarterly performance report on transportation systems, programs, and department management
Quarter ending June 30, 2012 • Published August 21, 2012 Paula J. Hammond, P.E., Secretary of Transportation

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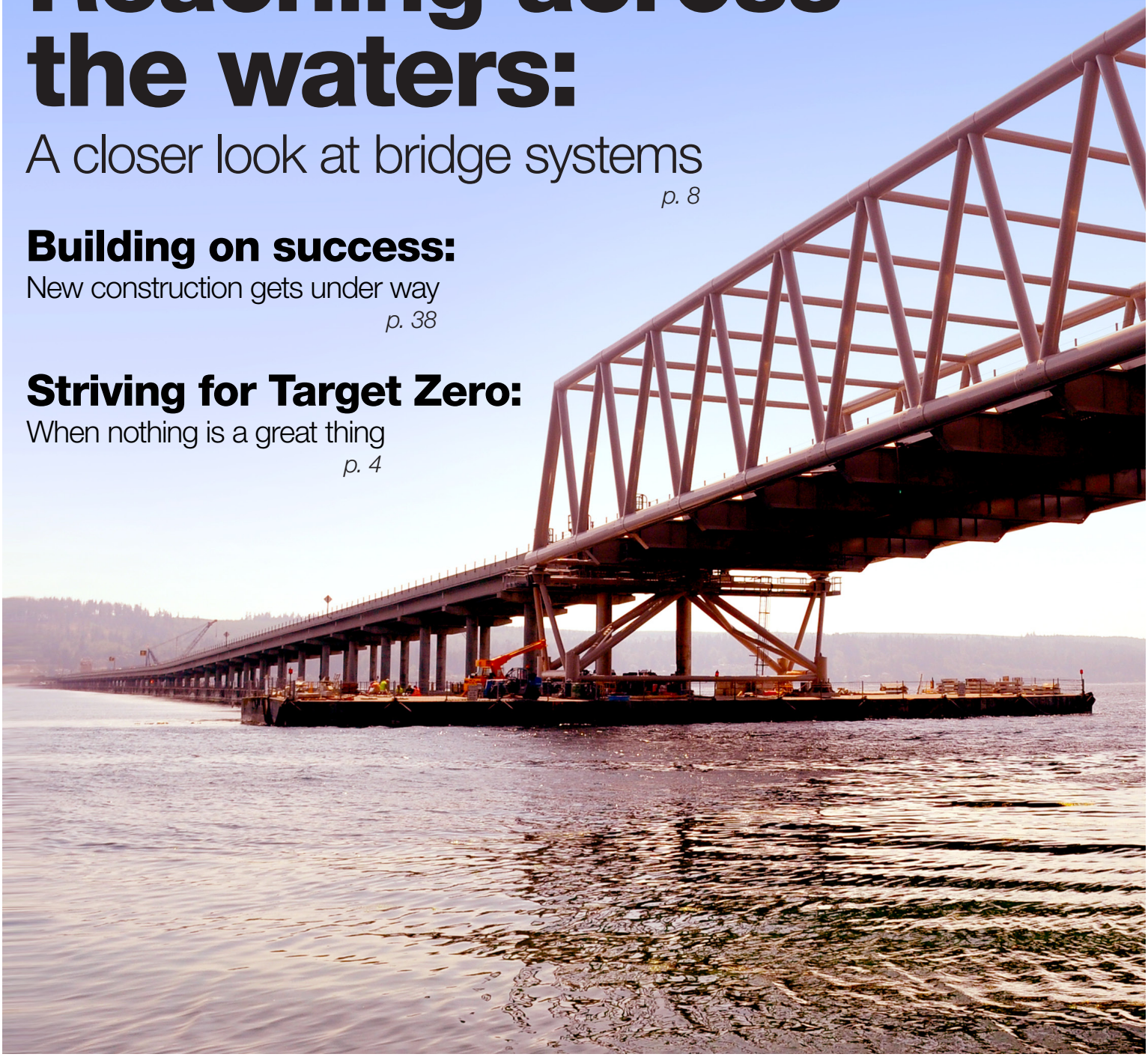

Asset Management: Bridge Assessment Annual Report

Bridge condition ratings just shy of Governor's performance goal

Bridge Preservation Highlights

- In FY2012, 95 percent of WSDOT's bridges and local agency-owned bridges are in good or fair condition.
- WSDOT's bridge inventory increased from 3,695 to 3,759 structures between FY2011 and FY2012.
- Eleven percent of the state's total bridge deck area was considered structurally deficient in 2011.

Ninety-five percent of WSDOT bridges are in good or fair condition while structurally deficient deck area grows 49 percent since 2007

Ninety-five percent of WSDOT's bridge structures and Washington state's local agency-owned bridge structures are in good or fair condition for fiscal 2012 (FY2012). At the same time, one element of the state's bridge conditions is declining. Some 11 percent of the deck area of all bridges is classified as structurally deficient, growing 49 percent since 2007.

The goal of WSDOT and the Governor's Government Management Accountability and Performance program is to maintain 97 percent of all bridges statewide at a rating of good or satisfactory (fair). This measure is consistent with data in the Office of Financial Management's Comprehensive Annual Financial Report. For FY2012, 86 percent of WSDOT's bridge structures were in good condition and nine percent were fair, totaling 95 percent in good or fair condition. This is just shy of the Governor's 97 percent goal.

The Federal Highway Administration's national inventory shows Washington has 7,743 bridges, which includes both state and local agency-owned structures. In 2011, there were 391 bridges (11 percent of deck area of all bridges) classified as structurally deficient, 152 of which are WSDOT bridges. The percentage of structurally deficient deck area in the state increased by 20 percent between 2010 and 2011 and 49 percent between 2007 and 2011. This increase is mostly the result of several large bridges now having deficiencies. Washington's percentage of structurally deficient bridge deck area is ranked 14th highest nationally.

WSDOT is responsible for managing state-owned bridges and related structures on state highways. These bridges carry a wide variety of freight and goods. WSDOT's performance measure to classify bridges as being in good, fair, or poor condition comes from the National Bridge Inspection Standards (NBIS) bridge superstructure, substructure, and deck codes, providing the best way to classify the overall structural condition of a bridge. WSDOT reports on bridge conditions in accordance to Washington's Office of Financial Management Governmental Accounting Standards Board. There are 3,244 WSDOT bridge structures rated for this performance measure, including 3,070 vehicular bridges longer than 20 feet, 118 culverts greater than 20 feet, and 56 ferry terminal structures carrying vehicles.

FHWA list of structurally deficient bridges

All publicly owned bridges in Washington State, 2007-2011

Year	Number of SD bridges	SD deck area (square feet)	Percentage of SD deck area
2011	391	8,046,191	11.0%
2010	394	6,706,707	9.1%
2009	405	6,202,863	8.5%
2008	422	5,904,672	8.2%
2007	400	5,403,983	7.5%

Data source: WSDOT Bridge and Structures Office, FHWA.

Bridge structural condition ratings

Condition ratings by fiscal year

Description		2007	2008	2009	2010	2011	2012
Good	No problems to some minor deterioration of structural elements.	88%	88%	89%	90%	86%	86%
Fair	All primary structural elements are sound; may have deficiencies such as minor section loss, deterioration, cracking, spalling, or scour.	9%	9%	8%	8%	9%	9%
Percent of bridges in good or fair condition		**97%**	**97%**	**97%**	**98%**	**95%**	**95%**
Poor	Advanced deficiencies such as section loss, deterioration, scour, or seriously affected primary structural components. May have truck weight restrictions.	3%	3%	3%	2%	5%	5%

Data source: WSDOT Bridge and Structures Office.

Note: As of FY2011 NBIS deck codes are included as part of the "good/fair/poor" measure. Previously only superstructure and substructure codes were included. The addition of deck codes brings WSDOT's "good/fair/poor" ratings into alignment with FHWA's structurally deficient metric.

Number of bridges in poor condition drops, inventory increases in FY2012

The SR 529 Ebey Slough Bridge replacement in Marysville.

Number of bridges in poor condition drops slightly in FY2012

In FY2012, five percent of WSDOT's bridge structures were rated in poor condition. There were 147 bridges in poor condition in FY2012 compared to 152 bridges in FY2011. Thirty bridges from FY2011 were no longer classified as poor in FY2012 due to preservation projects, but 122 bridges remained in poor condition both years, and 25 bridges were newly classified as poor.

In FY2012, 83 bridges were in poor condition due to the deck code inspection rating alone, comprising more than half of the 147 bridges rated poor and 2.6 percent of all WSDOT bridges. In FY2012, bridges in poor condition totaled 4.1 million square feet of deck area (8.9 percent of total WSDOT bridge deck area), a drop from 4.2 million square feet of deck area in FY2011 (9.6 percent).

Bridge inventory increases during FY2012

WSDOT's vehicular bridges 20 feet or longer has increased by 31 bridges, from 3,039 to 3,070 since July 2011. This is primarily due to the construction of new bridges in the highway system. WSDOT manages other types of structures within the bridge program as well, totaling 3,759 total bridge structures (see table below). These include 68 ferry terminal structures (56 that carry vehicles and 12 that do not carry vehicles). Construction of two new pedestrian bridges in 2011 increased the number of these structures from 72 to 74.

The average age of all WSDOT vehicular bridges is 43 years, with 233 bridges that are 75 years or older. The oldest documented state bridge is the earth-filled concrete arch on SR 290 over the Spokane River, built in 1910.

WSDOT inventory of bridges and structures

As of June 2012

Category	Number	Square feet[1]
Vehicular bridges longer than 20 feet	3,070	45,489,689
Structures shorter than 20 feet	374	N/A
Border bridges maintained by border state[2]	6	N/A
Culverts longer than 20 feet	118	N/A
Pedestrian structures	74	345,580
Tunnels and lids	43	N/A
Ferry terminal structures	68	751,480
Buildings (I-5 Convention Center)	1	N/A
Railroad bridges	5	N/A
Totals of all structures	**3,759**	**46,586,749**

Data source: WSDOT Bridge and Structure Office.

Notes: 1 Categories with N/A do not have an amount of square feet due to the structure type compared to a WSDOT bridge that carries vehicular traffic. 2 WSDOT provides 50 percent of the funding to maintain and preserve these border bridges shared with Oregon or Idaho.

Bridge preservation maintains a safe bridge network through cost-effective actions

Bridge preservation ensures state-owned bridges remain safe and operational. Trained WSDOT inspectors determine future preservation needs and priorities. Preservation projects are designed by engineers in the Bridge and Structures Office and then advertised to contractors for construction. State maintenance crews complete some repairs to preserve the state's bridge network. Bridge preservation activities include:

- Inspection – Perform federally-required inspections on state-owned bridges and other structures.
- Asset management – Identify, prioritize, and plan in order to preserve the bridge and structure network based on review of the inspection data.
- Replacement and rehabilitation – Rehabilitate and replace bridges when needed. Repair deteriorated bridge elements such as concrete columns, expansion joints, or anchor cables.
- Preservation – Extend bridge service life by repainting steel structures; also repair and overlay concrete bridge decks.
- Risk reduction – Seismic retrofit and scour repair of bridge piers to minimize earthquake and flood damage.

Asset Management: Bridge Assessment Annual Report

Bridge inspections balance impacts to drivers and the environment

Bridge inspection program helps WSDOT manage bridge assets

For 2012, WSDOT scheduled 1,371 bridges to be inspected. Under-bridge inspection trucks (UBIT) will be required on 256 inspections. WSDOT will perform 31 inspections for local agency bridges. There are 75 underwater inspections for bridges and 45 for ferry terminals planned this year. WSDOT will also inspect 175 sign structures.

Although bridges have regular inspection cycles, scheduling the appropriate dates for each bridge to be inspected takes coordination to minimize impacts. Bridge inspections requiring a UBIT in urban areas or on interstates are often done during a weekend traffic window from daylight to 10 a.m., and may require crews to use closures on several days to complete one inspection. Another restriction on bridges is for migratory birds: about 20 bridges on state highways require inspections to be scheduled outside of migratory birds' nesting periods. Federal Highway Administration (FHWA) inspection performance measures require a bridge to be inspected very close to its current inspection cycle. For example, if a bridge is on a 24-month cycle, it needs to be inspected as close as possible to the two-year anniversary date of its previous inspection.

Inspecting the state's bridges and structures ensures public safety, determines the condition of the asset, and provides a basis to determine future maintenance and preservation needs. The Federal Highway Administration, WSDOT, and cities and counties work together to ensure the quality of inspections. Joint agency bridge inspection classes are available each year to train and update bridge inspectors. The FHWA also conducts National Bridge Inspection quality assurance inspection reviews of a few local agencies one week each year.

About 60 WSDOT engineers and staff, including specialized teams, inspect state-owned bridges and structures. The latter includes pedestrian bridges, short-span bridges and culverts (shorter than 20 feet), sign support (cantilever and sign bridges), high mast luminaries, ferry terminals, and radio towers along state highways.

Bridge load ratings are used to ensure public safety

A bridge's design is based on a predetermined truck load when it is originally built. Engineers perform a load rating on the structures to verify they can safely carry legal and permitted loads. As structures get older and deteriorate, bridges are re-analyzed based on their condition in the field. If results show the structures are not safe to carry certain loads, traffic on the bridges is restricted to vehicles below the allowable weight.

Total number of bridges with weight restrictions
FY2010 to FY2012

Type of weight restriction		FY2010	FY2011	FY2012
Load posted bridges	Allowable weight of trucks is restricted below typical legal weight limits.	12	17	15
Load restricted bridges	Trucks must comply with reduced axle weights for a specific bridge.	129	125	133
Total		**141**	**142**	**148**

Data source: WSDOT Bridge and Structure Office.

Replacement and rehabilitation

As of June 2012, 147 bridges that are longer than 20 feet were classified as structurally deficient (SD). Twenty-four of these have been prioritized for future replacement/rehabilitation based on their truck volumes, structural condition, and any load restrictions in place. The total estimated cost to replace or rehabilitate these 24 bridges is about $285 million.

To qualify for federal funds for replacement, bridges must have a sufficiency rating of less than 50 and be classified as SD or functionally obsolete (FO). For rehabilitation, the sufficiency rating must be less than 80. (Definitions of SD and FO are available in the June 2009 *Gray Notebook* 34, p. 22).

WSDOT is investing in bridge preservation through two mobility projects that replace the existing seismically vulnerable Alaskan Way Viaduct and the Evergreen Point Floating Bridge with new structures built to current seismic codes. The costs to rebuild the structure portions of these projects are estimated as:

- The Alaskan Way Viaduct is estimated to cost $2 billion for replacement of the bridge structure. Costs for non preservation work such as electrical relocation, waterfront sea wall, and transit are not included in this estimate. Federal Bridge Funds for this project are about $233 million.
- The SR 520 Evergreen Point Bridge Replacement is estimated to cost $1.5 billion for bridge and approach span replacement. Federal Bridge Funds for this project are about $121 million.

WSDOT slates $101.1 million for bridge replacement and rehabilitation in the 2011 - 2013 biennium

In the 2011-2013 biennium, $101.1 million is slated for bridge replacement and rehabilitation. This is primarily funded through the Federal Bridge Replacement Rehabilitation Account, including Federal Bridge Funds for the Alaskan Way Viaduct. The South Holgate Street to South King Street section of the

Meeting the needs to replace and repair WSDOT's bridges

Alaskan Way Viaduct is $72.5 million. The costs for bridge replacement/rehabilitation projects currently under contract total $67.6 million, including:

- SR 529 Ebey Slough (Marysville) - $42.3 million
- U.S. 97 Satus Creek (Toppenish) - $8.4 million
- U.S. 2 Wenatchee River (Leavenworth) - $6.7 million
- U.S. 2 Chiwaukum Creek (Leavenworth) - $5.8 million
- SR 10 Bristol Fill (Cle Elum) - $4.4 million

WSDOT prioritized bridge replacement/rehabilitation

Ten-year plan FY2013 - FY2023; Dollars in millions

Category	Number of bridges	Total cost
Prioritized bridges on T1/T2[1] freight routes	11	$178
Prioritized bridges not on T1/T2[1] freight route	13	$107
Ten-year total	**24**	**$285**

Data source: WSDOT Bridge and Structures Office.

Note: 1 T1/T2 freight routes are routes with high truck volumes.

WSDOT invests $17.4 million in 2011 - 2013 biennium for bridge repairs and movable bridge rehabilitation

In order to stay on top of the repair needs of its aging bridges, WSDOT develops a prioritized contract list each biennium. Prioritized future repair needs are estimated to cost $100 million and with a budget of nearly $20 million per biennium, it will take WSDOT about ten years to complete the work on this list (see table below). Emergency contracts may be warranted for unexpected problems requiring immediate repairs on a bridge. The major repair category for bridge preservation includes corrective work that must be done through contracts. This work addresses specific bridge elements needing repair and is not intended to upgrade all deficiencies to current standards. The most common repair types include: expansion joint replacement, concrete column repair, floating bridge anchor cable replacement, and mechanical/electrical rehabilitation for movable bridges.

WSDOT bridge repair and moveable bridge rehabilitation needs

Ten-year plan FY2013 - FY2023; Dollars in millions

Category	Total cost
Bridge repairs	$73.5
Movable bridges	$26.5
Ten-year total	**$100**

Data source: WSDOT Bridge and Structures Office.

Summary of 10-year WSDOT bridge funding needs

Dollars in millions

Category	Allocated for 2011 - 2013 biennium	Projected needs for fiscal years 2013 - 2023
Bridge replacement/rehabilitation	$101.1	$285
Bridge repairs, movable bridges	$17.4	$100
Steel bridge painting	$39.1	$566
Concrete deck rehabilitation	$13.4	$156
Seismic retrofit*	$22.4	$152
Scour mitigation	$3.2	$15
Total	**$196.6**	**$1,274**

Data source: WSDOT Bridge and Structures Office.

Note: *Seismic retrofit needs are for prioritized structures on the I-5 corridor between Joint Base Lewis-McChord and I-90.

SR 508 South Fork Newaukum River Bridge closure

Built in 1930, the South Fork Newaukum River Bridge is located near Onalaska and has a main steel pony truss span with timber approach span. In December 2008, bridge engineers restricted the maximum truck load on the bridge to 18 tons, 29 tons, and 36 tons based on the type of truck and number of axles. An in-depth inspection in June 2012 found advanced corrosion in critical areas, prompting bridge engineers to close the bridge until temporary repairs could be completed by bridge maintenance crews. Once the repairs are complete, the bridge will be restricted to seven tons with no trucks allowed to cross the bridge.

The SR 508 South Fork Newaukum River Bridge.

SR 142 Klickitat River Bridge requires severe load restriction (three tons)

Built in 1954, the Klickitat River Overflow Bridge was the first in the state to use precast pre-stressed concrete girders. The bridge has concrete slabs supported by rebar between each girder. The steel reinforcing has advanced corrosion and is unable to safely carry truck loads. The bridge's load was restricted to three tons in May 2012. Bridge maintenance crews installed a single-lane, temporary "Bailey" bridge over the existing bridge (open to traffic on June 28) to allow trucks and buses up to 52.5 tons to cross the bridge.

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Preservation projects repaint and repair state bridges

WSDOT and ODOT equally share the cost to paint the U.S. 101 Astoria Bridge, near Astoria, Oregon. ODOT awarded the $17.5 million contract to paint the main truss on the Oregon side in 2012.

Steel bridge painting and rehabilitation

There are 104 WSDOT steel bridges currently due or past due for painting (including the Oregon-owned border bridges) and 160 total steel bridges needing painting work in the next ten years.

Painting the main truss on the Lewis and Clark Bridge (the final project phase) was awarded in June 2010 and will be completed in 2013. WSDOT has a $39.1 million budget for the 2011 - 2013 biennium to paint steel bridges. Ninety-four percent of this budget ($36.9 million) will be used to repaint two bridges over the Columbia River (the SR 433 Lewis and Clark Bridge and the U.S. 101 Astoria Bridge).

WSDOT owns 289 steel bridges requiring routine painting and shares painting costs for steel bridges on the Oregon and Idaho borders. Protective paint coatings on steel bridge elements are essential to prevent corrosion and extend their service life. Bridge painting is a major project with significant costs due to the complexity of safety, environmental, and containment system requirements. Bridge inspection data is used to determine the condition of the paint coatings on steel bridges.

WSDOT steel bridge painting needs

Ten-year plan FY2013 - FY2023; Dollars in millions

Category	Number of bridges	Cost to repaint
Past due for painting	28	$150
Due for painting	74	$200
Steel trusses – due within next ten years	51	$192
Unpainted weathering steel	5	$3
Oregon-owned border bridges	2	$21
Ten-year total	**160**	**$566**

Data source: WSDOT Bridge and Structures Office.

Nearly all the bridges on WSDOT's future paint list need full paint removal, requiring the construction of a containment system around the bridge to keep old paint and the abrasive material used to remove it from entering the environment. An emerging issue is how to balance the added weight of the containment system with the need to maintain traffic.

Bridge deck repair and overlay

WSDOT has been working since the early 1980s on a program to prevent concrete deck deterioration, which is generally caused by winter salt applications. Region maintenance crews provide temporary repairs, typically lasting a few years, in the form of quick-cure patching materials to keep bridges in service. A bridge deck rehabilitation and overlay can add more than 25 years of service life with minimal maintenance.

Bridges with concrete decks built after 1980 are constructed with epoxy-coated rebar that resists corrosion caused by winter de-icing salts. Bridge inspections identify pre-1980 bridges with deteriorated concrete deck areas that can be rehabilitated with a concrete overlay. The average cost to repair and apply a traditional modified concrete overlay to a bridge deck is nearly $80 a square foot (about 25 percent of the cost to completely replace a bridge deck and 10 percent of the cost to replace an entire bridge). WSDOT will schedule a bare concrete deck for repair and overlay when two percent or more of the deck area is deteriorated or has had previous maintenance repairs.

WSDOT primarily uses modified concrete overlays to rehabilitate concrete bridge decks. The first such repair was made in 1979. The average service life of a concrete overlay on bridges is about 25 years. It is very likely that more of these concrete overlays will require replacement in the future.

Concrete bridge deck rehabilitation projects under contract are:

- South Central Region (five bridges) - $2.0 million
- U.S. 395 Columbia River (Kettle Falls) - $1.9 million
- I-90 SR 18 Overcrossing (North Bend) - $700,000

WSDOT concrete bridge deck rehabilitation needs

Ten-year plan FY2013 - FY2023; Dollars in millions

Category	Number of bridges	Total cost
Past due for concrete overlay	43	$52
Due for concrete overlay	38	$40
Due within ten years	10	$64
Ten-year total	**91**	**$156**

Data source: WSDOT Bridge and Structures Office.

Note: Bridges that are past due and due for concrete overlay have had significant or small amounts of maintenance patching work, respectively.

Bridge risk reduction efforts minimize flood and earthquake damage

Seismic retrofit of selected bridges and scour repair of bridge piers in rivers are proactive approaches to minimize the risk of damage to bridges due to earthquakes and flooding.

Seismic retrofit bolsters bridges

The bridge seismic retrofit budget for the 2011 - 2013 biennium is $22.4 million. WSDOT has identified and prioritized bridges in the Puget Sound region that require a future seismic retrofit to minimize the risk of significant damage or collapse following a 1,000-year earthquake.

Bridge engineers perform a seismic analysis of each bridge to determine the exact scope of the retrofit. The most common type of retrofit for most bridges includes adding steel jackets around the columns and adding more concrete and steel reinforcing to the pier caps (also known as a "bolster").

WSDOT bridge seismic retrofit status
FY2012

Category	Number of bridges
Completely retrofitted	272
Partially retrofitted	134
Needs retrofitting	485
Under contract	10
Total	**901**

Data source: WSDOT Bridge and Structures Office.

WSDOT's long-range bridge seismic retrofit needs
Total remaining bridges statewide; Dollars in millions

Category	Number of bridges	Total cost
Bridges with single columns	11	$9
Special bridges	3	$11
Mainline I-5 Tacoma to I-90	34	$186
Mainline I-5 Everett to I-90	16	$184
Undercrossings I-5 Tacoma to I-90	15	$36
Undercrossings I-5 Everett to I-90	10	$20
I-405 bridges	27	$45
Remaining bridges with PGA[1] greater than 0.35	257	$615
Bridges with single columns and PGA less than 0.35	43	$24
Remaining bridges with PGA less than 0.35	213	$311
Total	**629**	**$1,441**

Data source: WSDOT Bridge and Structures Office.

Note: 1 PGA is Peak Ground Acceleration. PGA measures the intensity of an earthquake; the lower the PGA the more vulnerable a bridge structure is to earthquake movement.

Scour mitigation keeps bridges on solid footing

Nationally, as in Washington state, more bridges have collapsed from the scour of bridge foundations than from any other cause. The planned bridge scour repair budget for the 2011-2013 biennium is $3.2 million. The projected need for scour mitigation repair is $15 million for FY2013 - FY2023.

"Scour" is the eroding away of stream bed material from under bridge foundations. Scour generally happens when a river is experiencing high water flows.

- More than 1,500 WSDOT bridges and culverts longer than 20 feet in length are over water.
- There are 315 WSDOT bridges and culverts longer than 20 feet that are classified as "scour critical."

The term "scour critical" is used by the FHWA to classify bridges with a potential scour depth that is lower than the existing bridge foundations. WSDOT has developed a plan of action for each of these bridges. Once funding has been authorized for repairs, it generally takes two to four years to design a scour repair and obtain the environmental permits to complete the work.

Historical summary of WSDOT bridge failures

The most common cause of bridge failure is by scour of the bridge foundations during a flood. The most recent bridge failure in Washington due to scour occurred in 1999 on the old U.S. 101 Nolan Creek Bridge (replaced in 2004).

Historical bridge failures in Washington State

Category	Number of bridges
Unknown	2
Tsunami	2
Storm	3
Overload	3
Collision	4
Mt. St. Helens	5
Fire	9
Flood (scour)	43
Total	**71**

Data source: WSDOT Bridge and Structures Office.

Local agency bridge condition mirror state ratings

Of the state's local agency-owned bridges, 95 percent are in good or fair structural condition. As of July 2012, Washington has more than 3,900 locally owned and maintained bridges that support an average of 10 million crossings a day. The number of bridges fluctuates annually as new bridges are added to the system as part of construction projects and some older bridges are permanently removed. All bridges in Washington are designed and constructed for one primary goal: safety for the traveling public. Additional considerations include longevity, contributions to the community, and regional economic vitality. Local agencies follow the same guidelines for inspections as the state and bridges are inspected at least once every two years. WSDOT conducts field reviews and provides training and technical assistance to municipalities for inspecting bridges on city streets and county roads. WSDOT and local governments closely follow federal guidelines in bridge inspection and maintenance procedures.

Conditions of Washington's locally managed bridges

FHWA requires all states to report annual state, city, and county data concerning the structural condition and adequacy of all bridges statewide. A structurally deficient bridge is safe as long as all restrictions are obeyed, but it may need costly repairs or replacement in order to carry current legal loads. Following a thorough review, bridges are assigned a sufficiency rating between zero and 100. The rating takes into account some 75 factors reviewed during an inspection and considers a bridge's age, length and width, and the average traffic the bridge handles.

Structural condition ratings of Washington's locally managed bridges
July 2012

	County owned		City owned		Total	
Rating	% of bridges	% of deck area	% of bridges	% of deck area	% of bridges	% of deck area
Good	84%	85%	77%	75%	82%	81%
Fair	12%	11%	16%	12%	13%	11%
Percent of good and fair bridges					**95%**	**92%**
Poor	4%	4%	7%	13%	5%	8%

Data source: WSDOT Highways and Local Programs Office.
Note: The percent of deck area of bridges in each rating category is calculated out of total deck area of all county or city owned bridges.

Top five challenges for locally managed bridges in Washington

- **Age and deterioration:** Modern bridges are usually built to last 75 years or more. However, many older bridges were not intended for 75 years of service life. About 30 percent of locally owned bridges are more than 50 years old. Several bridges constructed before the 1960s need major repair or replacement.
- **Congestion:** Some of Washington's bridges have become bottlenecks for both freight and general traffic, particularly at interchanges and major river crossings.
- **Construction costs:** The money available for bridges buys less in the marketplace as construction costs have increased. The costs of steel, asphalt, concrete, and earthwork have risen. Additionally, replacing smaller bridges can result in construction of larger bridges in order to reduce impacts to streams and rivers and ensure environmental standards are met.
- **Maintaining bridge safety:** Nearly every state faces funding shortages which prevent them from applying the kind of ongoing preventive maintenance, rehabilitation, seismic strengthening, and replacement that would keep their bridges sound.
- **Regionally significant bridge replacement needs:** Rising costs of replacing bridges and related intersections exceed available resources, preventing cities and counties from making the larger bridge improvements that are needed to address congestion and serve economic growth.

Indicators of the condition of local bridges
July 2012

Condition	Number of bridges	Percent of bridges	Deck area (square feet)	Percent of deck area
Total inventory	3,978		14,711,000	
Sufficiency rating less than 30 and Structurally Deficient	66	1.7%	390,926	2.7%
Sufficiency rating less than 50 and Structurally Deficient	135	3.4%	920,050	6.3%
Sufficiency rating less than 50 and load posted	65	1.6%	305,895	20.8%

Data source: WSDOT Highways and Local Programs Office.
Note: The percent deck area in each condition category is calculated out of the total deck area of all locally managed bridges (14,711,000 square feet).

Programmatic Permits Annual Report

Programmatic permits save agency resources

Programmatic Permits Highlights

- WSDOT holds four programmatic permits from Department of Ecology and nine from Washington Department of Fish and Wildlife.
- The Department of Ecology reissued one permit in 2011.
- WSDOT estimates programmatic permits saved the agency up to 5,250 hours (656 eight-hour work days) in staff time in 2011.
- More than 100 programmatic agreements are negotiated between WSDOT and consulting parties to minimize project impacts on cultural resources.

Programmatic permits save time in the maintenance of over-water structures, like the one pictured above on the SR 12 Satsop River Bridge.

WSDOT estimates programmatic permits saved about 5,250 hours of WSDOT staff time in 2011. WSDOT develops these programmatic permits with the state's water resource regulatory agencies, Washington State Department of Ecology (Ecology) and Washington State Department of Fish and Wildlife (WDFW), to help simplify and expedite regulatory processes. These permits cover routine environmental activities that present minimal risk in the construction and maintenance of state transportation facilities.

Fish and Wildlife permits save 4,476 hours of WSDOT staff time

In 2011 WDFW programmatic permits covered 1,119 separate activities, saving WSDOT an estimated 4,476 staff hours that would have been spent completing the required permit applications. The real savings to WSDOT lies in the ability to perform maintenance and construction projects when needed, without a long lag time between the planning and the project phases. Programmatic permits allow maintenance projects to be performed expeditiously, without having to wait up to 45 days to receive a permit from WDFW. Staff hours saved are calculated as four hours per individual Hydraulic Permit Approval. Most of the permits with WDFW are individual Joint Aquatic Resource Permit Applications for specific in-water activities. The table on the following page shows the types of activities permitted. Notification requirements are typically reduced for programmatic permits because the work is routine in nature and has minimal impact on the environment. Notification prior to starting work ranges from no notification to three days for WDFW programmatic permits. WSDOT takes the step to notify WDFW of where maintenance will occur on an annual basis.

Department of Ecology permits save 760 hours of WSDOT staff time

Programmatic permits issued by Ecology cover activities such as washing and painting bridge structures, aquatic herbicide applications, and mosquito control. Again, an Ecology programmatic permit helps WSDOT better utilize resources. For example, seeking coverage for each separate aquatic plant or mosquito control activity could take up to 100 WSDOT staff hours without programmatic permits. WSDOT's "washing and painting bridges and ferry terminals" permit issued by Ecology saved an estimated 760 hours of staff time in 2011. The permit covers washing or painting ferry terminals and metal bridge structures. Staff hours saved are calculated as 40 hours per National Pollutant Discharge Elimination System permit. The notification period for the activities covered under the Ecology permit ranges from no notification to 10 days. Obtaining individual permits to perform these activities could take 45 days to six months (or longer) depending on the specific permit.

Programmatic permits improve efficiency by reducing the number of staff hours otherwise spent processing individual permits. They also provide standards that WSDOT can design its projects to meet. The two tables on the following page display the activities covered by active programmatic permits issued to WSDOT by the Department of Ecology and by WDFW.

Inventory of programmatic permits issued by state agencies

Programmatic permits issued by Washington State Department of Ecology

				Number of activities using permit				
Activity covered	**Description and guidance**	**Effective[1]**	**Expires**	**2007**	**2008**	**2009**	**2010**	**2011**
Washing and painting bridges and ferry terminals	Covers the following activities: Bridge washing and painting Ferry terminal washing and painting Spot cleaning for inspection	1/12/2010	1/12/2015	21	6	11	24	19
Aquatic mosquito control	Allows application of pesticide to control mosquito species in WSDOT's right of way	6/18/2010	6/18/2015	16	103	92	49	13
Aquatic plant and algae management general permit	Allows the application of herbicide to control non-noxious invasive plant species within WSDOT's right of way	3/18/2011	3/18/2016	2	1	0	0	0
Noxious aquatic plant control	Allows the application of herbicides to control noxious invasive plant species within WSDOT's right of way	1/16/2008	2/16/2013	0	1	4	4	11
Total				**39**	**111**	**107**	**77**	**43**

Data source: WSDOT Environmental Services Office.

Note: 1 Effective dates represent the most recent permit re-issue date, and not the original permit issue date.

Programmatic permits issued by Washington State Department of Fish and Wildlife

				Number of activities using permit				
Activity covered	**Description and guidance**	**Effective[1]**	**Expires**	**2007**	**2008**	**2009**	**2010**	**2011**
Channelized stream maintenance	Allows sediment removal to pre-existing conditions	6/02/2009	6/01/2014	31	25	12	42	27
Fishway structures in fresh waters statewide	Allows removal of sediments and other debris from fishways as well as minor structural repair	6/02/2009	6/01/2014	1	2	9	3	6
Statewide culvert maintenance in freshwater[2]	Allows structural repair and sediment removal	6/02/2009	6/01/2014	54	39	94	120	377
Debris removal from WSDOT bridge structures	Allows the removal and relocation of non-embedded large woody debris and material from WSDOT bridges	6/02/2009	6/01/2014	50	13	17	18	26
Statewide bridge and ferry terminal maintenance[3]	Covers bridge and ferry terminal maintenance and repair on over-water structures	6/02/2009	1/21/2013	1089	547	816	769	538
Beaver dam removal	Allows the removal of beaver dams within WSDOT's right of way	6/02/2009	5/01/2013	56	53	63	133	138
Freshwater sediment test boring	Covers freshwater sediment test boring activities	6/09/2009	6/09/2013	12	3	5	0	2
Marine sediment test boring	Allows test boring and sediment sampling for WSDOT projects in all state marine waters	2/13/2009	2/13/2014	7	3	4	4	2
Marine pile removal and replacement	Allows the replacement and removal of up to 40 piles per project in marine waters	2/18/2010	2/17/2015	2	2	1	5	3
Total				**1,302**	**687**	**1,021**	**1,094**	**1,119**

Data source: WSDOT Environmental Services Office.

Notes: 1 Effective dates represent the most recent permit re-issue date, and not the original permit issuance. 2 Culvert maintenance activities have increased due to WSDOT's culvert inspection program. It also reflects additional water bodies in Eastern Washington that have been determined to be seasonal or ephemeral streams by WSDOT and WDFW. 3 The number of bridge and ferry terminal maintenance activities is decreasing as WSDOT works with WDFW to determine which bridge maintenance activities warrant coverage under the General Hydraulic Permit Approval.

Programmatic Permits Annual Report

Programmatic agreements efficiently protect our cultural resources

More than 100 memorandums of agreement have been negotiated to avoid, minimize, or mitigate negative effects of WSDOT projects on cultural resources under terms of the programmatic agreements since 2003. These include prehistoric and historic archaeological sites, underwater sites, historic buildings and ferry terminals, and historic bridges.

Programmatic agreements save time and facilitate project delivery by streamlining the review process for environmental compliance. Programmatic agreements allow WSDOT to "exempt" activities from further review if they are determined to have little or no potential effect on historic resources. In agreement with the Department of Archaeology and Historic Preservation, WSDOT may exempt state-funded transportation projects based on the Statewide Section 106 programmatic agreement exemptions criteria.

The Statewide Section 106 programmatic agreements help facilitate environmental compliance by allowing WSDOT cultural resources specialists to consult directly with other federal, state, and tribal agencies, thereby greatly reducing the time it would take if FHWA or U.S. Forest Service staff had to act on every action between WSDOT and consulting parties.

Programmatic agreements explained

FHWA, WSDOT, the Washington State Department of Archaeology and Historic Preservation (DAHP), and the Advisory Council for Historic Preservation (ACHP) signed a revised statewide programmatic agreement in 2012 delegating WSDOT to conduct compliance with Section 106 of the National Historic Preservation Act on behalf of FHWA.

WSDOT signed a similar agreement in 2012 with the U.S. Forest Service, FHWA, ACHP, and DAHP to delegate Section 106 responsibilities for federal highway transportation projects on Forest Service land.

Section 106 protects historic resources like the Pilchuck Creek Bridge (built in 1916), eligible for listing on the National Register of Historic Places.

Programmatic agreements for Section 106 of the National Historic Preservation Act

Number and percentage[1] of activities exempted under programmatic agreements

Programmatic agreement	Description and guidance	Effective[2]	Amended	Expires	2007-2009	2009-2011	2011-2013
Statewide Section 106 FHWA	FHWA has delegated Section 106 responsibilities to WSDOT for FHWA transportation projects statewide. Under this agreement, certain undertakings may be exempt from Section 106 review that have little or no potential effect on cultural resources.	2003	2007, 2012	2017	123 (41%)	95 (27%)	39 (46%)
Governor's Executive Order (GEO) 05-05	In agreement with DAHP, WSDOT may apply the exemption criteria in the FHWA Statewide Section 106 Programmatic Agreement to state funded highway projects under GEO 05-05.	2005		does not expire	69 (23%)	43 (12%)	17 (20%)
USFS/ FHWA	The USFS has delegated Section 106 responsibilities to WSDOT for FHWA projects on USFS land. Undertakings subject to this agreement that have little or no effect on cultural resources may be exempt from Section 106 review.	2012		2017	N/A	N/A	2 (2%)

Data source: WSDOT Environmental Services Office.

Notes: 1 Number and percents are calculated per biennium. Percentages are the total exempted projects divided by the total number of projects during a biennium. 2 The Effective date represents the year the agreement was first enacted. 2011-2013 totals reflect available data through June 2012.