

Notable results

- In 2015, 92.1% of WSDOT bridges measured by deck area are in fair or better condition, a slight increase from 91.8% in 2014
- Of the 3,288 state-owned bridges, 120 have weight restrictions in FY2015, a decrease from 137 weight restricted bridges in FY2014
- Washington state is meeting the MAP-21 and Results Washington goals of having less than 10% of bridges in poor condition
- For the 2015-2017 biennium, 44 preservation projects on state-owned bridges are scheduled to begin construction

Bridge conditions improve slightly from previous year

As of June 2015, 92.1 percent of the state-owned bridges weighted by deck area were in fair or better structural condition. This is an increase from 91.8 percent in fair or better condition in June 2014. Bridge conditions have improved since 2010, when 90.4 percent of bridges by deck area were in fair or better condition. Measuring bridge conditions by deck area incorporates bridge size and is a more comprehensive measure than counting the number of bridges in certain conditions.

WSDOT is shifting its focus to bridge conditions weighted by deck area in order to align with Moving Ahead for Progress in the 21st Century (MAP-21) and Results Washington. Both of these programs set a goal of having no more than 10 percent of bridges measured by deck area be in poor condition, which Washington state met in 2014 and is on track to meet in 2015 (see box on [p. 16](#) for more information).

WSDOT has reduced the square footage of structurally deficient deck area by using innovative strategies, best management practices and past investments from the Nickel and Transportation Partnership Account programs.

Majority of WSDOT's bridges by deck area are in fair or better condition, meeting performance goals

Number of bridges and percent of bridges by deck area by condition category; Deck area in millions of square feet

STRUCTURAL CONDITION

		2010	2014	2015	Trend
GOOD/VERY GOOD¹ Bridges in good condition range from those with no problems to those having some minor deterioration of structural elements.	Bridge deck area	15.6	18.5	19.2	↑
	Percent of deck area	30.2%	34.8%	36.0%	↑
	Number of bridges²	1,419	1,591	1,628	↑
FAIR¹ Primary structural elements are sound; may have minor section loss, deterioration, cracking, spalling or scour. This is the most cost-effective time to rehabilitate before the underlying structure is damaged.	Bridge deck area	31.0	30.4	29.9	↓
	Percent of deck area	60.2%	57.0%	56.1%	↓
	Number of bridges²	1,620	1,554	1,522	↓
GOOD/VERY GOOD & FAIR TOTALS: Goal = 90% or more deck area in fair or better condition	Bridge deck area	46.6	48.9	49.1	↑
	Percent of deck area	90.4%	91.8%	92.1%	↑
	Number of bridges²	3,039	3,145	3,150	↑
POOR A bridge in poor condition has advanced deficiencies such as section loss, deterioration, scour, or seriously affected structural components, and may have weight restrictions. A bridge in poor condition is still safe for travel.	Bridge deck area	4.9	4.4	4.2	↓
	Percent of deck area	9.6%	8.2%	7.9%	↓
	Number of bridges²	145	141	138	↓

Data source: WSDOT Bridge and Structures Office.

Notes: The above data only includes state-owned bridges. 1 The definition of good and fair condition was revised to comply with the definitions in the proposed Moving Ahead for Progress in the 21st Century (MAP-21) regulations. This revision shifted a higher percentage of bridges to fair condition (56.1 percent in 2015 compared to 11.7 percent in 2014) and a smaller percentage of bridges in good condition (36 percent in 2015 compared to 80.1 percent in 2014). All numbers shown in the table above are based on the revised "out-to-out" calculation method (which includes curbs and rails on the bridge) instead of the bridge width curb-to-curb. 2 WSDOT is phasing out this measure because the Results Washington and MAP-21 bridge performance measures focus on conditions by deck area.

Local bridge conditions hold steady from previous year

Limited resources have made it challenging to manage the entire WSDOT bridge network to lowest life cycle cost. Lowest life cycle cost methodology uses proven preservation actions to extend the useful life and minimize maintenance costs over the entire life of an asset. This cost effective method ensures that assets are kept in good or fair condition, helping to maintain safety and useful life.

By number of bridges, 3,150 of the 3,288 state-owned bridges are in fair or better condition in 2015, while 138 are in poor condition (structurally deficient). During fiscal year (FY) 2015 (July 2014 through June 2015), 25 state-owned bridges deteriorated to a poor condition state, and 28 bridges were repaired/preserved, transitioning them from poor to good condition.

A bridge's condition is upgraded from poor condition when either region maintenance crews or contractors working on WSDOT projects have completed the necessary work to repair, or in some cases replace, a bridge element or the entire bridge. Bridges are considered as being in poor condition when bridge inspectors find new deterioration or damage affecting primary structural members. Bridges in poor condition are still safe for travel.

Most local agency bridges in fair or better condition in Washington

There are more than 7,300 bridges across Washington on city streets, county roads and state highways. Of these, more than 4,000 are locally owned and support an average of 10 million crossings per day. Approximately 93 percent of Washington's local bridges by deck area were considered to be in fair or better condition in FY2015, holding steady from FY2014. Keeping these bridges in good repair is necessary to defer much larger replacement costs in the future.

The Bridge Replacement Advisory Committee program, which is comprised of members from cities and counties,

Local agency bridges remain in good condition

Local agency bridge conditions for fiscal year 2015

Condition	Number of bridges	Deck area (millions of square feet)	Percent of deck area
Fair or better	3,842	16.6	93%
Good	3,285	14.3	80%
Fair	557	2.3	13%
Poor	196	1.2	7%
Total	4,038	17.8	100%

Data source: WSDOT Local Programs Office.

awarded 32 projects to local agencies in 2014. The intent of this program is to preserve and improve the conditions of city and county bridges that are physically deteriorated or structurally deficient through bridge replacements, bridge rehabilitation, and preventative maintenance (such as scour repair, paint for steel structures, seismic retrofit, deck overlays and joint replacement).

Cities and counties have similar roles and responsibilities to WSDOT in managing local bridges. Federal funding along with state and local funding sources continue to help local agencies build new or maintain existing bridges.

A closer look at MAP-21, Results Washington and GASB bridge condition requirements

The federal Moving Ahead for Progress in the 21st Century (MAP-21) legislation establishes performance targets that states have no more than 10 percent of bridge deck area classified as structurally deficient on the NHS. States failing to meet this target for three consecutive years must devote a portion of National Highway Performance Program funds to improve bridge conditions. Results Washington (see [p. 22](#)) also sets a target of no more than 10 percent of NHS bridge deck area classified as structurally deficient (poor condition).

The state is also required to follow Generally Accepted Accounting Principles, which include rules set by the Governmental Accounting Standards Board (GASB). This board governs the financial reporting of infrastructure assets, and requires WSDOT to maintain an up-to-date inventory of assets and to document condition assessments. For the purpose of GASB reporting, WSDOT has a bridge condition goal of 90 percent of state-owned bridge deck area in fair or better condition.

Bridge condition reporting requirements

Condition targets by performance reporting system

Performance reporting system	Target	Which bridges are included?
Moving Ahead for Progress in the 21st Century (MAP-21) (see p. 6)	≤10% of deck area on structurally deficient (poor condition) bridges	All NHS bridges (state- and locally-owned)
Results Washington (see p. 22)	≤10% of deck area on structurally deficient (poor condition) bridges	All NHS bridges (state- and locally-owned)
Governmental Accounting Standards Board (GASB)	≥90% of bridge deck area in fair or better condition	All state-owned bridges (NHS and non-NHS)

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.
Note: NHS = National Highway System.

WSDOT manages 138 state bridges in poor condition

Structurally deficient bridges in Washington state

As of June 2015; Percent of bridges and 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
State-owned	44.2	2,255	53.4	3,288
<i>Amount SD (%)</i>	3.9 (8.8%)	95 (4.2%)	4.2 (7.9%)	138 (4.2%)
Locally-owned²	4.6	195	17.8	4,038
<i>Amount SD (%)</i>	0.4 (8.3%)	21 (10.8%)	1.2 (6.8%)	196 (4.9%)
Total	48.8	2,450	71.2	7,326
<i>Amount SD (%)</i>	4.3 (8.8%)	116 (4.7%)	5.4 (7.6%)	334 (4.6%)

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 Measuring bridge conditions by deck area provides a more comprehensive measure than by number of bridges because it factors in bridge size. 2 Bridges owned by counties and cities.

Nearly 8 percent of bridges by deck area deficient statewide

Structurally deficient bridges represented 7.6 percent (5.4 million square feet) of the total 71.2 million square feet of bridges in Washington as of June 2015. By number of bridges, 334 of the 7,326 total bridges in the state were considered structurally deficient. A bridge is considered structurally deficient if it has a defined amount of deterioration in the deck, superstructure (everything above the supporting structure, such as the roadway beams and girders), and/or substructure. A bridge with a rating of four or lower on a scale of one to nine is rated as structurally deficient and is also rated as poor by WSDOT (see table in [Gray Notebook 50, p. 14](#)).

Of the 334 state and local structurally deficient bridges in Washington as of June 2015, 138 were state-owned bridges managed by WSDOT, a slight decrease from 141 in 2014. WSDOT's 138 structurally deficient bridges account for 4.2 million square feet of deck area, which is 7.9 percent of the bridge deck area owned by WSDOT and 5.9 percent of all (state and local) bridge deck area in Washington.

The total deck area of structurally deficient bridges on the National Highway System (NHS) in Washington increased from 4.0 million in 2014 to 4.3 million in 2015. The NHS is a network of strategic highways within the United States, and includes both state and local highways and roads serving major airports, ports, rail and/or truck terminals, pipeline terminals and other transport facilities (see [Gray Notebook 54, p. 6](#)). Washington's



The State Route (SR) 520 Albert D. Rosellini bridge is WSDOT's longest structurally deficient bridge, totaling 7,518 feet long. This bridge, along with the SR 99 Alaskan Way Viaduct and Interstate 90 bridges (the next largest structurally deficient bridges in the state) are currently being replaced and scheduled to be completed in 2017. Together, these bridges account for 2 percent of the state-owned deck area in Washington.

NHS includes 2,450 bridges, 2,255 (92 percent) of which are managed by WSDOT. The remaining 195 (8 percent) are managed by cities and counties.

Deterioration of the bridge decks is the reason for more than half (84) of the 138 bridges in poor condition. These bridges are repaired by WSDOT maintenance crews on an as-needed basis until funding is available to fully address deck issues. Then WSDOT rehabilitates, or in some cases replaces, their concrete or asphalt decks (see [p. 20](#) for a map of preservation projects scheduled for construction in the 2015-2017 biennium).

WSDOT has 17 fewer load restricted and posted bridges

A total of 120 state-owned bridges were load posted or restricted in FY2015, down from 137 in FY2014. Nearly half (58 out of 120) of WSDOT's load posted or restricted bridges are on the NHS, and slightly more than one-fifth (26 out of 120) were considered structurally deficient in FY2015. In addition, there were 167 locally-owned bridges that were load restricted in FY2015 (10 of which were on the NHS), an increase from 159 in FY2014.

WSDOT performs load rating evaluations to verify whether bridges can safely carry the weight of trucks using them. Bridges are designed to carry the standard truck weight load when they are built. If load rating evaluation results show the structure cannot safely carry certain loads, WSDOT implements weight restrictions to reduce the risk of damage:

- A bridge may first be "load restricted," making it illegal for any overloaded truck to use the bridge.

Number of load posted and restricted bridges declines

WSDOT has 120 load restricted or load posted bridges
Fiscal years (July through June), 2012-2015; Number of bridges with weight restrictions



Data source: WSDOT Bridge and Structures Office.

Notes: A bridge may first be “load restricted,” making it illegal for any overloaded truck to use the bridge. As the condition worsens, the bridge’s capacity to carry heavy loads decreases and the bridge is “load posted.” This limits the allowable weight of trucks below typical legal weights.

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A quarter of posted and restricted bridges are along freight corridors

Of WSDOT’s 120 load posted and load restricted bridges, one quarter (30 bridges) are on T-1 or T-2 freight corridors. Most of these are load restricted bridges, which affect large loads that are over legal weight limits. Trucking companies must obtain a special permit to haul loads that are over the legal limit. When a bridge is load restricted, trucks can be equipped with special trailers to distribute the weight or drivers can take alternate routes. Most bridge restrictions impact the movement of large equipment.

Trucking companies that use alternate routes must factor the cost of transporting their freight as part of their operating costs. Increases in these transportation costs will eventually be transferred to consumers.

As of June 2015, there were no load posted bridges on T-1 freight corridors (routes carrying more than 10 million annual tons), and two load posted bridges on T-2 freight corridors (routes carrying four to 10 million annual tons). Bridges with load postings below the legal weight limit can impact routine freight movement, such as garbage trucks or trucks delivering goods to grocery stores. An online map of load restricted and load posted bridges in Washington state is available at <http://www.wsdot.wa.gov/commercialVehicle/Restrictions/Default.aspx>.

WSDOT’s online bridge clearance trip planner helps trucks travel safely and efficiently

WSDOT recently developed a Bridge Vertical Clearance Trip Planner, an application intended to help the public identify bridges with restricted vertical clearances on state highways. This tool allows users to enter their vehicle height and locate bridges on state routes that will not clear their load. More information can be accessed at <http://www.wsdot.wa.gov/Bridge/Structures/BVCTP.htm>.

Washington’s inventory of bridge structures continues to expand

The state-owned bridge inventory that WSDOT manages included 3,849 structures as of June 2015, with 53.4 million square feet of deck area. WSDOT has added 15 vehicular bridges (plus another five bridge structures) to its inventory since June 2014, primarily due to new bridges being built.

In addition to the 3,849 state-owned bridges, there were 5,848 locally-owned bridges in Washington state in FY2015, an increase of 69 structures from the previous fiscal year. Vehicular bridges longer than 20 feet account for 69 percent of the local bridge inventory, and total 17.8 million square feet of deck area.

Washington bridge inventory grows by 89 structures

Fiscal years 2014 and 2015; Inventory of state and local bridges

	State		Local	
	2014	2015	2014	2015
Vehicular bridges longer than 20 feet	3,093	3,108	4,001	4,038
<i>Average age (years)</i>	44	45	43	43
Structures less than 20 feet long	402	410	1,405	1,409
Culverts longer than 20 feet	131	124	-	-
Pedestrian structures	76	79	226	252
Ferry terminal structures	68	68	8	9
Tunnels and lids	43	44	2	2
Border bridges				
Maintained by border state ¹	6	6	1	1
Maintained by Washington ²	5	5	-	-
Railroad bridges	5	5	136	137
Total bridge structures³	3,829	3,849	5,779	5,848

Data source: WSDOT Bridge and Structures Office and WSDOT Local Programs Office.
 Notes: 1 WSDOT funds 50 percent of the preservation for 11 border bridges. Six of these bridges are maintained by the border state (five with Oregon and one with Idaho). 2 Four of these bridges are shared with Oregon and one with Idaho. 3 Inventory totals do not equal the total number of state and local bridges on p. 17 because inventory includes miscellaneous structures that the Federal Highway Administration (FHWA) does not require to be inspected. FHWA requires states to report on conditions for all vehicular bridges longer than 20 feet (including ferry terminal structures and culverts longer than 20 feet), which are the 3,288 state-owned and 4,038 locally-owned bridges.

Inspection program helps maintain bridge performance

Nearly 10 percent of state-owned bridges are 75 years or older

The average age of WSDOT's 3,108 vehicular bridges is 45 years. WSDOT has 310 bridges that are 75 years old or older, and have 3.1 million square feet of total deck area. The estimated total project cost to replace these bridges is nearly \$2.3 billion. WSDOT has another 196 bridges that are between 65 and 74 years old, which have 2.3 million square feet of total deck area and an estimated total project cost to replace of nearly \$1.7 billion. The average age of a locally-owned vehicular bridge longer than 20 feet in Washington is 43 years; 492 vehicular bridges are older than 74 years.

WSDOT conducts 2,106 bridge inspections in FY2015

WSDOT performed 2,106 bridge inspections in FY2015, more than three-quarters (1,599) of which were routine inspections. WSDOT manages bridges through inspection, maintenance, rehabilitation and replacement. These are essential aspects of bridge management to determine their current condition, identify deficiencies, extend their service life, and maintain bridge safety.

While the majority of WSDOT's bridges are inspected on a two-year cycle as mandated by the Federal Highway Administration (FHWA), there are 110 bridges with specific watch items that require them to be inspected annually. Currently, a total of 537 concrete bridges that are in good condition and meet defined FHWA criteria are inspected on a four-year cycle. WSDOT performs federally required inspections on all state-owned bridges as outlined in the National Bridge Inspection Standards to determine bridge conditions, and preservation and maintenance needs.

Local agencies performed 2,412 bridge inspections in FY2015. The vast majority (2,325) of these inspections



An inspector ascends the superstructure of the SR 433 Lewis and Clark Bridge, 340 feet above the Columbia River. The bridge forms a mile-long link between Longview, Washington, and Rainier, Oregon.

WSDOT performs 2,106 bridge inspections

July 2014 through June 2015; Number of inspections by type

Type of inspection	Number
WSDOT routine bridge inspections	1,599
WSDOT under bridge inspection truck (UBIT) bridge inspections	238
Special bridge inspections	76
WSDOT local agency inspections	58
Underwater bridge inspections	51
Mechanical and electrical inspections	48
WSDOT routine ferry terminal inspections	26
Fracture critical ferry terminal inspections	10
Total WSDOT bridge inspections	2,106

Data source: WSDOT Bridge and Structures Office.

Note: The inspections shown in the table above are for the state-owned bridges listed on p. 15. The Federal Highway Administration (FHWA) requires inspections on vehicular bridges longer than 20 feet. WSDOT performs inspections on all structures included in the inventory, but only reports on the inspections required by FHWA.

were routine. In addition, they performed 68 inspections on fracture critical structures (bridges that contain support pieces or members that are under tension, where failure would likely cause a portion of or the entire bridge to collapse), and 19 underwater inspections. Local agencies follow the same federal guidance for inspections as the state. Even though most local governments inspect their own bridges, WSDOT conducts field reviews and provides training and technical assistance to Washington cities and counties for inspecting bridges on local roads.

Bridge engineers also perform specialized work to determine the condition of selected bridge elements (such as fracture critical members and mechanical elements on movable bridges), along with the routine inspections.

Maintenance plans \$25.4 million in bridge repairs during biennium

WSDOT employs various strategies to extend the service life of its assets, while minimizing life cycle costs. These strategies include performing day-to-day maintenance repairs as well as preservation work to ensure bridge assets do not deteriorate to a condition that is beyond repair. Bridge maintenance work is mainly performed by WSDOT crews and is often completed within a matter of days.

Hundreds of maintenance repairs are needed on bridges throughout the highway system each year. During the 2015-2017 biennium, crews plan to perform \$25.4 million in structural bridge repairs, which include a combination of

WSDOT preserves bridges with innovative strategies

Priority 1 (highest priority) through Priority 3 (lowest priority) repairs. About 42 percent of the bridge maintenance funding (\$10.7 million) is allotted for Priority 1 repairs, while the rest will be used for deck maintenance, bridge cleaning, and the operation of movable and floating bridges.

In FY2015, 28 percent of Priority 1 repairs were completed, a decrease from 54 percent completed in the previous fiscal year. A number of factors contributed to this decrease, primarily the focus on bridge deck repairs and deck cleaning, which removed resources from structural repairs. In addition, the cost of the repair and time required to complete the work which can vary widely across repairs.

WSDOT uses cost-effective strategies to preserve bridges

Through the use of strategic asset management, timely bridge maintenance and preservation, WSDOT can extend the service life of bridges. Bridge preservation strategies WSDOT uses include repairing concrete bridge

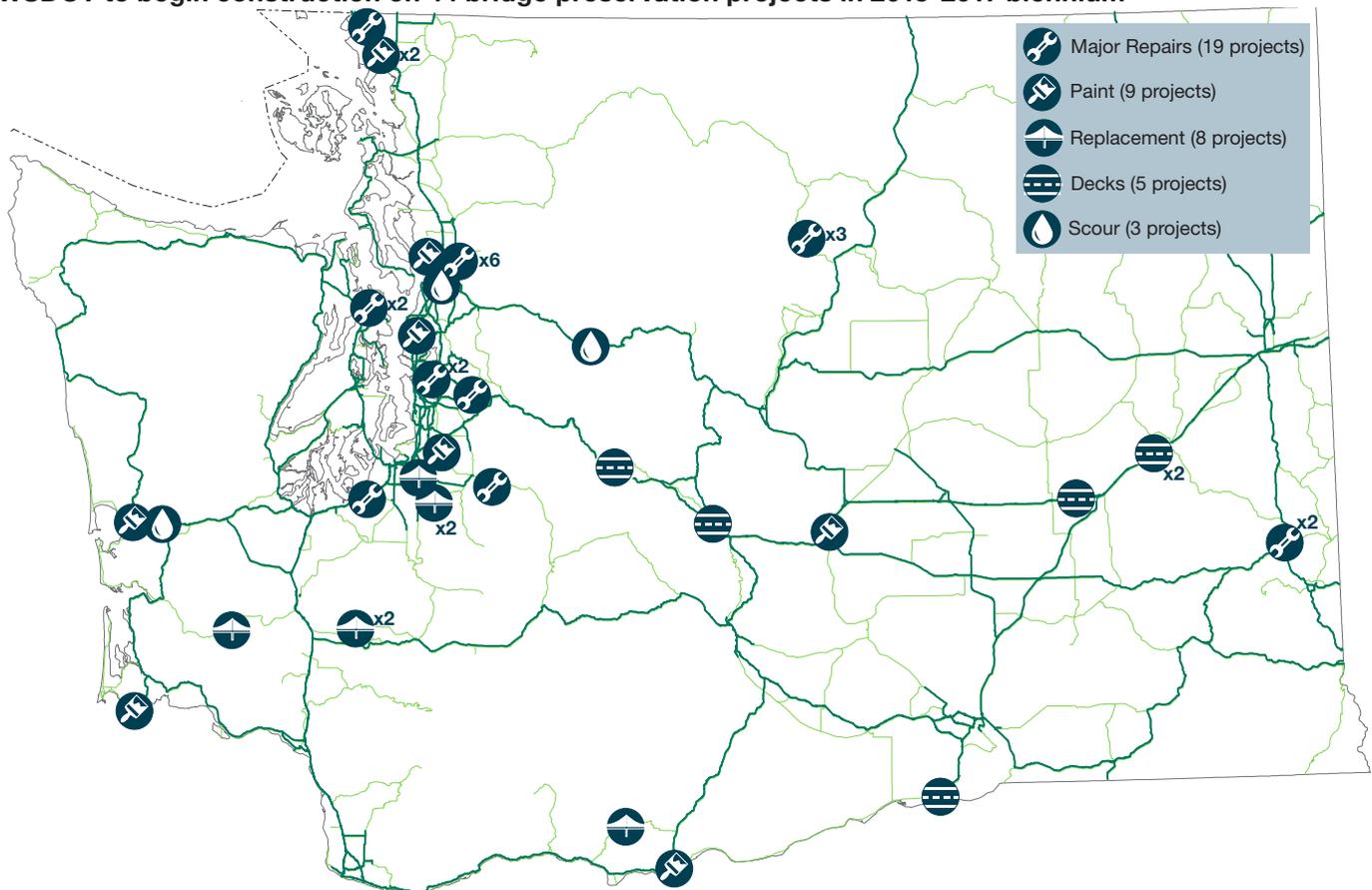
decks, repainting steel bridges, replacing deteriorated bridge elements, and rehabilitating or replacing bridges.

In contrast to maintenance repairs, WSDOT hires private sector contractors to perform preservation work. A bridge is considered for replacement when the problem causing the structural deficiency may reduce the load-carrying capacity of the bridge, and the cost of rehabilitation is more than 60 percent of the replacement cost.

WSDOT has been utilizing the tools of practical design to strategically preserve bridges. Following WSDOT Secretary, Lynn Peterson's direction in August 2014, the agency implemented a practical design program to reduce costs by making project decisions that focus on the specific problem the project is intended to address. This approach seeks lower cost solutions that produce the best return on investment for specific performance criteria.

For example, while many states simply replace bridge decks when they deteriorate, WSDOT repairs decks

WSDOT to begin construction on 44 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).

WSDOT plans four concrete overlay projects along I-90

and applies a concrete overlay. This is a more cost-effective option to extend the bridge's life (see [p. 21](#) for more information on concrete deck repair).

Strategy: Repairing concrete bridge decks extends service life

WSDOT plans to complete four concrete overlay projects in the 2015-2017 biennium on I-90. In addition, WSDOT maintenance crews plan to spend \$2.9 million for bridge deck repairs. The current six-year preservation funding plan includes \$84.1 million for concrete bridge deck rehabilitation and overlay (\$36 million of which is for addressing asphalt on bridges in roadway paving projects).

The majority of state-owned bridges have reinforced concrete decks. The primary goal of WSDOT's comprehensive bridge deck program is economically repairing and overlaying concrete bridge deck to prolong their lifespan and avoid expensive deck replacements.

Once the reinforcing steel in concrete bridge decks starts to corrode (for example, due to winter weather or the use of deicing salt), this causes the concrete to "spall" (pothole) and deteriorate. WSDOT maintenance crews repair spalled areas annually, but these repairs are considered to be temporary and typically last one to three years. Once the total area of repairs and/or patching exceed 2 percent of the total deck area, the bridge is added to the list of future needs and is classified as structurally deficient. Bridge deck overlay projects are prioritized based on the total square footage of deterioration and the type of freight route on which the bridge is located. Bridges on the most vital freight routes get higher priority.

When funding becomes available, WSDOT hires contractors to perform deck repairs and add a protective overlay (normally a 1.5-inch thick layer of modified concrete). A full bridge deck rehabilitation and concrete

Twenty five bridge decks are past due for repair

As of June 2015; Dollars in millions

Bridge deck needs	Number of bridges	Cost to repair
Past due ¹	25	\$25.7
Due ²	46	\$45.1
Due within the next 10-years	21	\$71.5
Total 10-year needs	92	\$142.3

Data source: WSDOT Bridge and Structures Office.

Notes: 1 Bridges with more than 5 percent of their deck area patched or spalled are classified as "past due." 2 Bridge decks with 2 to 5 percent of their deck area patched or spalled are classified as "due."

overlay extends the bridge's service life by at least 25 to 30 years and is more cost-effective for bridge decks that have repeated deterioration, yet is less expensive than replacing the entire deck or bridge.

As a result of WSDOT utilizing modified concrete overlays as a bridge deck preservation strategy, very few total deck replacements have been necessary (14 bridges since the 1960s). There are 165 bridges with modified concrete overlays that have provided more than 25 years of service. WSDOT has replaced 13 modified concrete overlays to date (800,000 square feet) and has identified another 30 (1.1 million square feet) that will need to be replaced during the next eight to 10 years.

Strategy: Repainting steel bridges maintains fair or good condition

WSDOT plans to complete repainting projects on eight steel bridges by the end of the 2015-2017 biennium, with a total estimated biennial cost of \$31 million. These bridges include the State Route (SR) 99 George Washington Aurora Avenue Bridge in Seattle, two steel trusses on



Crews will repaint all of the steel on the truss of the SR 18 Green River (Neeley) Bridge near Auburn in summer 2015. This will protect the steel for another 20 years and help preserve the bridge's structural integrity.

WSDOT needs \$771 million¹ to fully fund its 10-year steel bridge painting plan

Fiscal years (FY) 2015 through 2025; Planned projects and spending for 2015-2017 biennium; Dollars in millions

Painting needs	Number of bridges	Cost to repaint
Currently due or past due	99	\$394
Due for painting ²	25	\$188
Past due for painting ³	74	\$206
Planned for 2015-2017 biennium	8	\$38
Due within the next 10 years	49	\$290
Border bridges	3	\$49
10-year total need	159	\$771

Data source: WSDOT Bridge and Structures Office.

Notes: 1 Number has been updated since the 2015 Unfunded Priorities List was provided to the Legislature in February. 2 A steel bridge is classified as "due" for painting if it has exposed steel on between 2 and 5 percent of the structure. 3 A steel bridge is classified as "past due" for painting if it has exposed steel more than 5 percent of the structure.

Five WSDOT bridges under contract for replacement

I-5 over the Nooksack River near Ferndale, the U.S. 101 Hoquiam River bridge in Hoquiam, the SR 18 Green River bridge near Auburn and the I-90 Columbia River bridge near Vantage. In addition, WSDOT will share the cost of repainting two bridges over the Columbia River with Oregon (U.S. 101 Astoria and U.S. 97 Biggs Rapids).

A protective paint coating on steel bridges is essential for preventing corrosion, extending their service life and keeping them in fair or better condition. Bridges are prioritized for repainting based on the amount of corrosion and the route on which they are located, with bridges on primary freight routes given top priority. Steel truss bridges should be repainted every 20 to 25 years on average and newer steel girder bridges should be painted approximately every 40 years. Bridge painting is a major repair project with significant costs due to the complexity of safety, environmental regulations and containment system requirements. On average, a steel truss bridge is considered in poor condition if it has been past due for painting for at least five years, or 10 years for steel girder bridges.

Strategy: Replacing deteriorated bridge elements to extend bridge life

WSDOT has three projects underway which will replace deteriorated bridge elements. This work includes replacing a maintenance traveler under the westbound Tacoma Narrows Bridge, replacing anchor cables on the two I-90 floating bridges across Lake Washington and on the west half of the SR 104 Hood Canal Bridge, and replacing expansion joints on six I-5 bridges between Everett and Marysville. In addition, WSDOT plans to go to contract on five additional repair projects between July 2015 and June 2017.

Bridge rehabilitation projects address specific elements such as expansion joint replacement, concrete column repair, and anchor cable replacements on floating bridges.

Strategy: Rehabilitating or replacing structurally deficient bridges

Currently, there are 18 state-owned bridges that are structurally deficient and require replacement; five of these are currently under contract. In addition, there are 29 bridges that are structurally deficient that have been identified as needing rehabilitation (a major preservation repair) with two requiring bridge deck replacement.

Bridges that have reached the end of their service life will require rehabilitation or replacement.

Rehabilitation is considered before replacement.

Generally, if rehabilitation is 60 percent or more of the replacement cost then replacement is chosen.

WSDOT has a \$23.4 million budget for bridge replacement and rehabilitation projects for the 2015-2017 biennium. There are four active contracts on four bridge projects that have a budget of \$9.1 million. In addition, six projects will begin design and three will go to construction in the 2015-2017 biennium.

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Anna Schmidt, the 9-year-old daughter of Northwest Region IT Applications Specialist David Schmidt, shows the Tacoma Narrows Bridge, an honorable mention from a recent art contest held by WSDOT's Office of Strategic Assessment and Performance Analysis.

Results Washington Leading Indicator

Based on current funding levels, control the percent of state and local bridges in poor condition from increasing over 10 percent by 2017.

Status: On plan (green)

Strategies:

1. Replacing deteriorated bridge elements -

WSDOT performs major preservation repairs by addressing specific bridge elements to improve a bridge with a low condition rating. The most common types of repairs include floating bridge anchor cable replacement, expansion joint replacement and concrete column repair.

2. Repainting steel bridges -

A protective paint coating on a steel bridge is essential to prevent corrosion, extend the bridge's service life and keep the bridge in fair or better condition. Continuing to keep up with painting can prevent the number of bridges in poor condition from increasing.

3. Repairing concrete bridge decks -

WSDOT is working to reduce the number of bridges classified as structurally deficient by addressing bridges with the highest benefits and the most cost savings. One strategy to do so is to repair and rehabilitate concrete bridge decks to extend their service life.

Percent of bridges on the NHS that are structurally deficient (by deck area)	
State-owned	8.8%
Locally-owned	8.3%
Combined	8.8%