



Public Works Department

Spokane County, Washington

Date: March 25, 2019

To: Board of County Commissioners

From: Chad Coles, PE
County Engineer

Subject: **2018 ANNUAL BRIDGE REPORT**

The bridges of the County Road System have been inspected in accordance with the County Road Administration Board guidelines and herewith I submit a report of the findings of the inspection. These findings will be taken into consideration in the preparation of the proposed 2020 Annual and 2020-2025 Six Year Construction Programs.

The report also comments on some of the major bridge accomplishments during the past year and describes some of the bridge projects contemplated this year.

I would be glad to meet with the Board to discuss and answer questions about the report, if the Board desires.

ANNUAL BRIDGE REPORT

March 2019

The following report is submitted in accordance with W.A.C. 136-20-060, and is the findings of the annual inspection of the bridge inventory. Included is a brief explanation of bridge inspection, State and County funding, a review of the current bridge conditions and a summary of bridge design and construction work during the past year. Spokane County currently has 166 bridges in its bridge inspection inventory, 17 of which are owned by the Railroad. In addition, the County provides inspection and load rating services for 7 small city bridges for a total of 173 bridges. The replacement value of these structures is estimated to be \$313 million dollars.

BRIDGE INSPECTION

The County follows the National Bridge Inspection Standards (NBIS) in its program as required by the Federal Highway Administration (FHWA) in accordance with the Code of Federal Regulations part 650. The inspection requirements of this standard are met by performing inspections in two categories: Routine Inspections and Special Inspections. Routine Inspections must be done at least once every two years and Special Inspections are performed at different intervals as required by the condition of the bridge. Special Inspections often require specialized equipment and training to perform.

Routine Inspections and some aspects of Special Inspections are accomplished by Bridge Department staff. To perform Special Inspections, the County utilizes the services of a local company, Commercial Grading, to provide the specialized equipment and operators required to accomplish these inspections. In addition, the WSDOT Bridge Preservation Dive Team performs Underwater Inspections.

For the towns of Spangle, Fairfield, and Rockford, the Bridge Department staff performs routine inspections and other work, such as load rating and scour evaluation. A complete inventory of structures that Spokane County inspects can be found in Appendix A.

ROUTINE INSPECTIONS: Routine and interim inspections were conducted on 86 bridges. All deficiencies found from the inspections have been noted and scheduled for routine maintenance either with the Spokane County Bridge Maintenance Crew or put on the list for future Small Works Roster projects.

SPECIAL INSPECTIONS: Three Inspections fall under this category:

Fracture Critical Inspection (FC): Spokane County has no FC bridges.

Underwater Inspections: In 2018, two Underwater Inspections were performed for the County. The WSDOT dive team inspected both Valley Chapel Road Bridge No. 3303 over Latah Creek and Harvard Road Bridge No. 5502 over the Spokane River.

Under Bridge Inspection Truck (UBIT): These inspections require the use of a truck that can access the soffits of high span bridges which cannot be inspected from the ground. In 2018, six County bridges received UBIT inspections. These included: Old State Route Bridge No. 3112, Valley Chapel Rd Bridge No. 3301, Jackson Rd Bridge No. 4307, Argonne Rd Bridge No. 4504, Harvard Rd Bridge No. 5502, and Appleway Ave Bridge No. 5515.

Other noteworthy elements of the NBIS which are integral to the bridge program are:

LOAD RATING: All bridges on the inventory have been rated to determine the percentage of legal loads which they can safely carry. This is an ongoing effort and the files are maintained as the condition of the inventory changes. This work is shared between Bridge Department staff and a consultant.

In 2014, FHWA mandated that all bridge load ratings be updated to address a new class of trucks. A two-tier timetable was established and the Bridge Department is currently working to ensure compliance with the load rating schedule.

SCOUR EVALUATIONS: All bridges over water must be evaluated for the stability of their foundations due to the erosion of the stream bed which supports them. For bridges that have foundations classified as scour critical or unknown, a Scour Plan of Action has been prepared which includes monitoring during high flows and is updated as needed.

FUNDING

The Federal Government provides the main source of funds for bridge rehabilitation and replacement projects which are constructed under contract. Under the MAP-21 structure, bridges located on the National Highway System are eligible for funding under the National Highway Performance Program (NHPP) while bridges not located on the NHS have a separate set-aside in the Surface Transportation Program (STP). In Washington, the MAP-21 Steering Committee created a set-aside for the local bridge program. Agencies with eligible bridges can then apply for these funds through a process which awards funds to those bridges with the greatest need. In general, eligibility is established based on four criteria with the sufficiency rating being the primary factor. The sufficiency

rating (SR) is a number on a scale of 0 to 100, with 100 being a new bridge, that captures all the factors which reflect the condition of a bridge. The other three criteria are structural deficiency (SD), functional obsolescence (FO), and scour condition.

Figure 1, below, shows the general trend of the sufficiency rating for the 149 Spokane County owned bridges (not including the railroad owned bridges). A complete list of the SD, FO, and weight restricted bridges can be found in Appendix B.

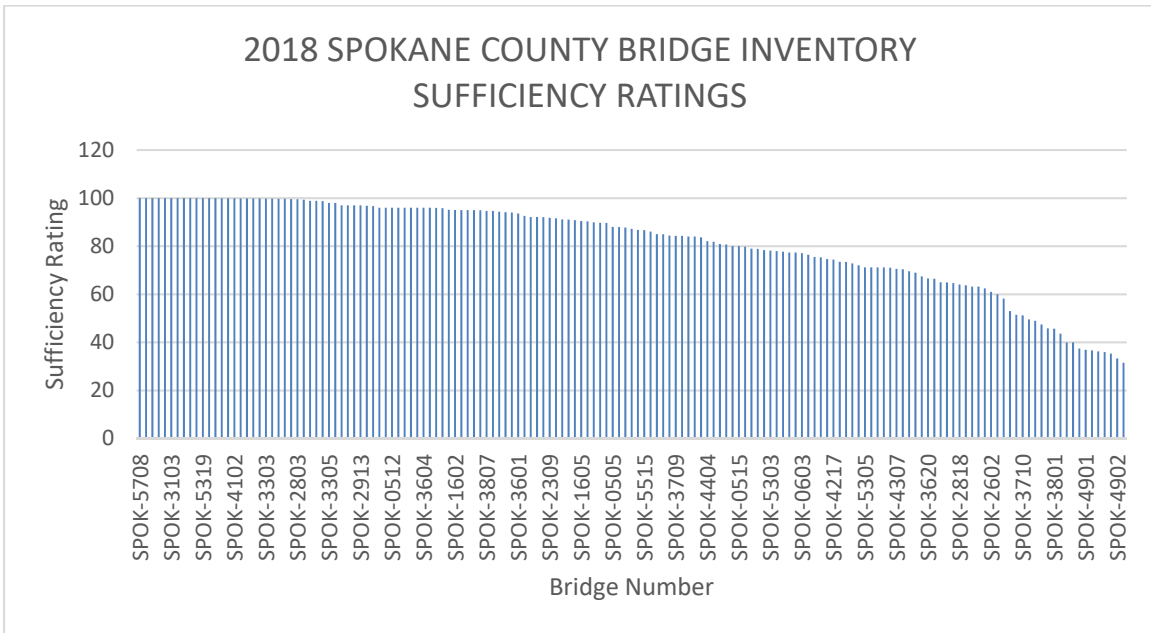


Figure 1: Sufficiency ratings for the 148 Spokane County owned bridges.

In most years, Federal funding is provided at an 80% level with the County Road Fund providing a 20% match. However, on occasion, State funding such as those available through the Rural Arterial Program (RAP) have been utilized as matching funds.

The County Road Fund provides money for replacing short span bridges (less than 20 feet in length) that are not eligible to receive funding through the State, as well as yearly routine maintenance of bridges.

In 2017, the local bridge program awarded approximately \$73 million in funds to be distributed to local agencies throughout the State in the upcoming years. The next call for projects is anticipated in early 2019.

RECENTLY FUNDED PROJECTS

In December 2017, the County was successful in obtaining \$2,303,140 in Federal grants for the following three bridge projects: Frideger Road Bridge #4902 replacement, Elk-Chattaroy Road Bridge #4901 deck repair, and North Kentuck Trails Road Bridge #4205 scour mitigation. The topographic surveys took place in 2018 with the preliminary engineering scheduled to begin in 2019 for all three projects.

The following are photos of two structures that demonstrate bridges with a high funding priority because of deficiencies and are both weight restricted. Both bridges were awarded funds in 2017 for either replacements or deck repairs.



Structural Deficient

Sufficiency Rating: 33.27 SD

Friderger Road Bridge No. 4902 over Little
Spokane River



Structural Deficient

Sufficiency Rating 36.88 SD

Elk-Chattaroy Road Bridge No. 4901 over Little
Spokane River

ACTIVE PROJECTS

The following table outlines the status of the active projects in 2018.

PROJECT	ESTIMATED TOTAL COST	PLANNED CONSTRUCTION DATE	FUNDING
Projects Constructed in 2018			
Bigelow Gulch/Forker Intersection CRP 2989A	\$1,653,895*	Construct in 2018	STP RAP
Monroe Road Bridge No. 2803 CRP 3188	\$1,919,867	Construct in 2018	Federal County
Projects in Design			
Frideger Road Bridge No. 4902 CRP 3239	\$1,300,500	Construct in 2020	Federal County
Elk-Chattaroy Road Bridge No. 4901 CRP 3237	\$580,900	Construct in 2019	Federal County
Blanchard Road Culvert Replacement CRP 3229	\$574,500	Construct in 2019	Federal County
Pine Bluff Road Bridge No. 2609 CRP 3230	\$568,100	Construct in 2020	Federal County
Deer Park Milan Road Bridge No. 3915 CRP 3241	\$1,325,200	Construct in 2021	County

*Only includes estimated construction cost for bridge.

COMPLETED BRIDGE PROJECTS

During the past year, two bridge projects were completed and/or near completion. The following are a few details about the projects.

Monroe Road Bridge No. 2803 over West Branch of Dragoon Creek, CRP 3188 was a bridge replacement project. It is located approximately 3.5 miles southwest of Deer Park. The new structure is a single span, prestressed concrete girder bridge with a concrete cast-in-place deck, built on the existing alignment. The bridge was open to traffic in November 2018.

Bigelow Gulch Road Bridge No. 4604 over Forker Road, CRP 2989A is part of the Bigelow/Forker Intersection Project. This is a new bridge provides a grade separation of Bigelow Gulch and Forker Roads. The structure is a single span, prestressed concrete girder bridge with a cast-in-place deck, supported on stub abutment walls. Each abutment is supported by permanent geo-synthetic retaining walls with cast-in-place fascia panels. The bridge opened to traffic in September 2018 with Forker Road traffic under the bridge open in November 2018. Work on the structure will be completed in 2019.

BRIDGE DESIGN

County Bridges are designed using in the latest edition of the AASHTO LRFD Bridge Design Specification in concert with the WSDOT Bridge Design Manual. Following is a short description of the bridges which are currently under design.

Frideger Road Bridge No. 4902 over Little Spokane River, CRP 3239 is a bridge replacement project. It is located approximately 0.07 miles east of Elk-Camden Road in north Spokane County. The existing single span, conventionally reinforced concrete structure is scour critical and weight restricted for all seven legal trucks. The replacement structure will be a single span, prestressed concrete girder bridge with a concrete cast-in-place deck and include a roadway realignment. The topographic survey was completed in 2018 with design work scheduled for 2019 and construction in 2020.

Elk-Chattaroy Road Bridge No. 4901 over Little Spokane River, CRP 3237 is a bridge deck rehabilitation project. It is located approximately 15 miles east of Highway 2 in north Spokane County. The three-span bridge is 77 feet long and comprised of two piers with cantilevered slabs beyond the piers. The deck will be rehabilitated and new bridge approaches will be with structural earth walls constructed to better protect the approach fills.

Blanchard Road Culvert Replacement over Blanchard Creek Overflow, CRP 3229 is a culvert replacement project. It is located approximately 9.5 miles east of Elk-Chattaroy Road on Blanchard Creek Road, 50 feet south of Blanchard Road. The four existing culverts, 2-36" and 2-30" are deteriorating and not adequately conveying the flows. The replacement structure is a precast concrete three-sided bottomless culvert, with a 12-foot wide opening and approximately 34 feet wide. The profile of Blanchard Creek Road will be revised to allow the installation of the structure and maximize the freeboard.

Pine Bluff Road Bridge No. 2609 over Coulee Creek, CRP 3230 is a bridge scour repair project. It is located approximately 0.2 miles north of Seven Mile Road in northwest Spokane County. The bridge is a three span, prestressed concrete bridge. High spring flows from 2017 have caused significant stability concerns to the foundations of the two interior piers. Repairs include anchoring a cast-in-place concrete to the bedrock and using soil anchors with reinforced shotcrete on the slopes with riprap at the toe of the slopes in front of each interior pier.

Deer Park Milan Road Bridge No. 3915 over Bear Creek, CRP 3241 is a bridge replacement project. It is located approximately 4 miles east of Deer Park. The existing single span cast-in-place concrete bridge was built in 1921 and widened to the north in 1973. It is scour critical and deteriorating. The replacement structure will be a three-sided bottomless culvert, built on the existing alignment. The topographic survey was completed in 2018 with design work scheduled for 2019 and 2020 and construction in 2021.

BRIDGE MAINTENANCE

Routine maintenance includes work on the inventory of timber bridges, by rebuilding deteriorated superstructures, updating bridge rail systems, repairing damaged guardrail and scour repair. There is also an extensive inventory of concrete bridges which receive maintenance work such as; repairing and washing decks, cleaning and replacing expansion joints and bridge rail repairs. The bulk of this work is accomplished by the Bridge Maintenance Crew who also handle emergency repairs and monitoring of the inventory during high water events.

MAJOR BRIDGE MAINTENANCE

No major bridge maintenance work was completed in 2018.

**APPENDIX A
INVENTORY OF STRUCTURES**

Spokane County

Bridge Description	Total Number of Bridges	Bridges with weight restrictions	Bridges with height restrictions
Railroad Under Crossings (Primary Safety Inspections)	17	0	13
Railroad Over Crossings	7	2	0
River, Stream, Drainage Crossings, Trails, and Roadways	142	12	0
Totals:	166	14	13

SMALL CITY BRIDGES INSPECTED BY SPOKANE COUNTY

City of Fairfield

Bridge Description	Total Number of Bridges	Bridges with weight restrictions	Bridges with height restrictions
River, Stream and Drainage Crossings	2	0	0
Totals:	2	0	0

City of Rockford

Bridge Description	Total Number of Bridges	Bridges with weight restrictions	Bridges with height restrictions
River, Stream and Drainage Crossings	1	0	0
Totals:	1	0	0

City of Spangle

Bridge Description	Total Number of Bridges	Bridges with weight restrictions	Bridges with height restrictions
River, Stream and Drainage Crossings	4	0	0
Totals:	4	0	0

APPENDIX B
2018 BRIDGE REPORT FIGURES AND TABLES

Bridges Categorized as Structurally Deficient in 2018

Bridge #	Bridge Name	Sufficiency Rating	Posting Status	Year Built	Length (ft)	Traffic Volume (ADT)
SPOK-4902	FRIDEGER ROAD	33.27	Posted	1957	30	289
SPOK-3704	L SPO DR OVER L SPO RIV	35.30	Posted	1951	90	1136
SPOK-0514	SUNSET HWY OV N FK DP CR	35.98	Posted	1910	27	34
SPOK-3112	OLD STATE ROUTE 195	36.20	Posted	1929	195	438
SPOK-2606	WAIKIKI RD OVER L SPO R	36.60	Open	1961	168	2944
SPOK-4901	ELK-CHATTAROY OVER L SPO	36.88	Posted	1962	77	902
SPOK-6206	IDAHO RD OV SF ROCK CRK	39.94	Posted	1959	42	37
SPOK-2404	CHENEY-SPO OVER UP&BN RR	51.47	Posted	1949	547	3301

Bridges Categorized as Functionally Obsolete in 2018

Bridge #	Bridge Name	Sufficiency Rating	Posting Status	Year Built	Length (ft)	Traffic Volume (ADT)
SPOK-3715	GREENLEAF DRIVE	31.51	Open	1990	126	1592
SPOK-3703	COLBERT ROAD	37.44	Posted	1953	90	2004
SPOK-2608	7-MILE RD OV. DEEP CREEK	53.00	Open	1958	170	2594
SPOK-1508	EUCLID RD OV. BNSFRR TRK	63.18	Open	1980	103	578
SPOK-3308	VALLEY CHAPEL ROAD	63.70	Open	1923	38	401
SPOK-4204	KEEVEY ROAD	64.65	Open	1976	96	19
SPOK-4403	DUNN ROAD	77.70	Closed	1963	42	1
SPOK-3701	L SPO DR OVER L SPO RIV	80.03	Open	1961	97	2004
SPOK-4212	HAYS ROAD	93.99	Open	1960	81	16
SPOK-3313	ELDER RD OV CALIFORNIA CREEK	94.93	Open	1984	73	62
SPOK-5216	HARVARD ROAD BRIDGE	95.98	Open	1993	72	31
SPOK-4103	ROBERTS ROAD BRIDGE	95.99	Open	1992	200	26

**APPENDIX B
2018 BRIDGE REPORT FIGURES AND TABLES**

Bridges with Weight Restrictions in 2018

Bridge #	Bridge Name	Sufficiency Rating	Posting Status	Year Built	Length (ft)	Traffic Volume (ADT)
SPOK-4902	FRIDEGER ROAD	33.27	Posted	1957	30	289
SPOK-3704	L SPO DR OVER L SPO RIV	35.30	Posted	1951	90	1136
SPOK-0514	SUNSET HWY OV N FK DP CR	35.98	Posted	1910	27	34
SPOK-3112	OLD STATE ROUTE 195	36.20	Posted	1929	195	438
SPOK-4901	ELK-CHATTAROY OVER L SPO	36.88	Posted	1962	77	902
SPOK-3703	COLBERT ROAD	37.44	Posted	1953	90	2004
SPOK-6206	IDAHO RD OV SF ROCK CRK	39.94	Posted	1959	42	37
SPOK-3801	CHATTAROY RD OV LITTLE SPOKANE RIVER	45.66	Posted	1953	45	1706
SPOK-3902	DEER PARK MILAN ROAD	47.37	Posted	1954	42	1562
SPOK-2203	WELLS RD OVER SANDERS CR	49.50	Posted	1953	30	305
SPOK-2404	CHENEY-SPO OVER UP&BN RR	51.47	Posted	1949	547	3301
SPOK-3705	SHADY SLOPE OVER L DEEP	64.91	Posted	1955	20	1421
SPOK-3620	JAY AVE OVER DRAINAGE	66.54	Posted	1963	27	156
SPOK-1102	BADGER LK OVERFLOW BR	77.33	Posted	1952	21	193
SPOK-2401	MARSHALL RD OV MARSHALL CREEK	39.96	To be Posted*	1960	19	44
SPOK-4814	ANTLER ROAD	43.62	To be Posted*	1955	18	13
SPOK-5712	WALLIS RD OV SOUTH FORK DEADMAN CK	45.79	To be Posted*	1948	15	30

* = Load rated in 2018 with recommendation to post. Hearing for traffic code revision scheduled for February 2019.