ANNUAL BRIDGE REPORT

April 2018

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 165 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 seven small city bridges for a total of 172 bridges. The replacement value of these structures is estimated to be $308 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 inspections were conducted on 91 bridges. All deficiencies found from the inspections have been noted and scheduled for routine maintenance. Due to the unusual high water resulting in the inability for County inspectors to inspect the substructure, the County contracted with the WSDOT Bridge Preservation Dive Team to complete a routine inspection of both Coulee Hite Rd Bridge #0512 and Sunset Highway Bridge #0514, both over the North Fork of Deep Creek, in the late fall.

SPECIAL INSPECTIONS: Three Inspections fall under this category:

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

Underwater Inspections: In 2017, two Underwater Inspections were performed for the County. The WSDOT dive team inspected both Valley Chapel Road Bridge No. 3301 over Latah Creek and Appleway Road Bridge No. 5515 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 2017, five County bridges received UBIT inspections. These included: Cheney Spokane Rd Bridge No. 2404, Seven Mile Rd Bridge No. 2608, Pine Bluff Rd Bridge No. 2609, Wandermere Rd Bridge No. 3603, and Elder Rd Bridge No. 5303.

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 148 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.

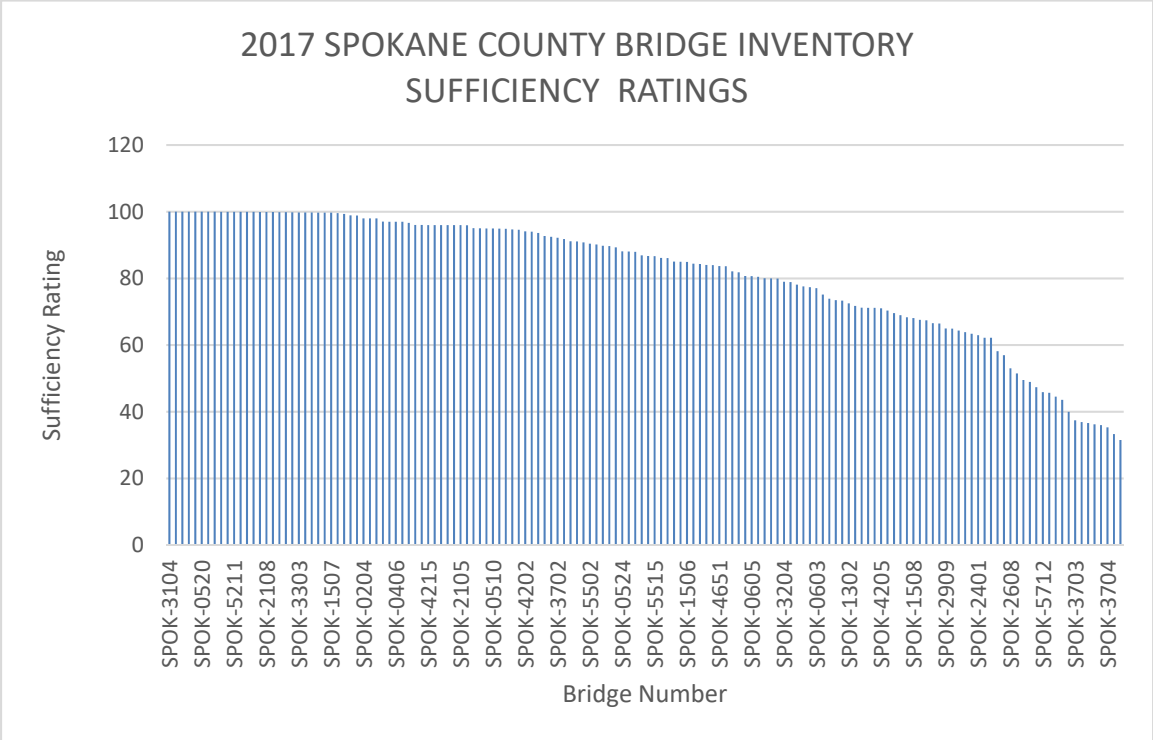

Figure 1: Sufficiency ratings for the 148 Spokane County owned bridges.

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 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. Preliminary engineering is scheduled to begin in 2018 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
Frideger Road Bridge No. 4902 over Little Spokane River

Structural Deficient
Sufficiency Rating 38.88 SD
Elk Chattaroy Road Bridge No. 4901 over Little Spokane River

ACTIVE PROJECTS

The following table outlines the status of the active projects in 2017.

PROJECT	ESTIMATED TOTAL COST	PLANNED CONSTRUCTION DATE	FUNDING
Projects Constructed in 2017			
Ritchey Road Bridge No. 0503 CRP 3189	$1,862,901	Constructed in 2017	Federal County
Holcomb Road Bridge No. 4705 CRP 3217	$543,558	Constructed in 2017	County
Projects in Design			
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

*Only includes estimated construction cost for bridge.

COMPLETED BRIDGE PROJECTS

During the past year, three bridge projects were completed. The following are a few details about the projects.

Ritchey Road Bridge No. 0503 over Deep Creek, CRP 3189 was a bridge replacement project. It is located approx. 4.5 miles west of the City of Airway Heights, south of SR 2. The existing structure was a 5-span timber trestle bridge which was posted with weight restrictions. The new structure was designed using Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) technology. It is a single span, prestressed concrete bridge with a cast-in-place deck constructed on the existing alignment. Construction was completed in October 2017.

Holcomb Road Bridge No. 4705 over Deadman Creek, CRP 3217 was a culvert replacement project. The new structure replaced two 6-foot diameter culverts. The bottom of the culverts had deteriorated to the point where it was affecting the surface of the road over the pipes. A temporary one lane, 42' steel bridge was used to span over the existing culverts to allow access for local traffic. The new structure was designed with Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) technology. It was constructed on the existing alignment and is a single span, prestressed concrete slab bridge bearing on GRS abutments. The bridge was opened to traffic in November 2017.

Split Creek Pedestrian Bridge over Liberty Creek, was a pedestrian bridge replacement project. The bridge is located in Liberty Lake Regional Park and was designed by the County Bridge Department for construction by the Spokane County Parks Department. The existing 3' wide by 24' long timber bridge was replaced with a new 6' wide by 31'-8" long structure designed using Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS) technology with a timber superstructure. The Parks Department constructed the new bridge in September 2017.

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.

Bigelow Gulch Road over Forker Road Bridge No. 4604, CRP 2989A, is part of the Bigelow/Forker Intersection Project. This is a new bridge which will provide a grade separation of Bigelow Gulch and Forker Roads. The planned 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.

Monroe Road Bridge No. 2803 over West Branch Dragoon Creek, CRP 3188 is a Bridge Replacement project. It is located approximately 3.5 miles southwest of Deer Park. Existing is a 2 span, conventionally reinforced concrete structure. The replacement structure will be a single span, prestressed concrete girder bridge with a concrete cast-in-place deck, built on the existing alignment.

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 2017.

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	1	0
River, Stream, Drainage Crossings, and Trails	141	11	0
Totals:	**165**	**12**	**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
2017 BRIDGE REPORT FIGURES AND TABLES

Bridges Categorized as Structurally Deficient in 2017

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-3112	OLD STATE ROUTE 195	36.20	Posted	1929	195	438
SPOK-2803	MONROE RD BRIDGE	43.57	Posted	1959	41	703
SPOK-3201	KEEVY RD OV. SPANGLE CREEK	68.94	Open	1951	23	56
SPOK-2404	CHENEY-SPO OV. UP&BN RR	51.47	To be Posted*	1949	547	3301
SPOK-2606	WAIKIKI RD OV. LITTLE SPOKANE RIVER	36.60	Open	1961	168	2944
SPOK-4901	ELK-CHATTAROY OV. LITTLE SPOKANE RIVER	36.88	Posted	1962	77	902
SPOK-3704	LITTLE SPOKANE DR OV. LITTLE SPOKANE RIVER	35.30	Posted	1951	90	1136
SPOK-0514	SUNSET HWY OV. N FK DEEP CREEK	35.98	Posted	1910	27	34
SPOK-6206	IDAHO RD OV. SF ROCK CREEK	39.94	Posted	1959	42	37

* = Load rated in 2017 with recommendation to post. Hearing for traffic code revision scheduled for April 2018.

Bridges Categorized as Functionally Obsolete in 2017

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-3308	VALLEY-CHAPEL ROAD	63.37	Open	1923	72	401
SPOK-4204	KEEVEY ROAD	64.36	Open	1976	96	19
SPOK-1508	EUCLID RD OV. BNSF RR TRK	68.09	Open	1980	103	578
SPOK-4403	DUNN ROAD	77.57	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 OVER CALIF CREEK	94.91	Open	1984	73	90
SPOK-5216	HARVARD ROAD BRIDGE	95.98	Open	1993	72	31
SPOK-4103	ROBERTS ROAD BRIDGE	95.99	Open	1992	200	26

APPENDIX B
2017 BRIDGE REPORT FIGURES AND TABLES

Bridges with Weight Restrictions in 2017

Bridge #	Bridge Name	Sufficiency Rating	Posting Status	Year Built	Length (ft)	Traffic Volume (ADT)
SPOK-0514	SUNSET HWY OV. N FK DEEP CREEK	35.98	Posted	1910	27	34
SPOK-1102	BADGER LK OVERFLOW BR	77.33	To be Posted*	1952	21	193
SPOK-2203	WELLS RD OV. SANDERS CR	49.50	Posted	1953	30	305
SPOK-2404	CHENEY-SPOKANE OV. UP&BN RR	51.47	To be Posted*	1949	547	3301
SPOK-2803	MONROE RD BRIDGE	43.57	Posted	1959	41	703
SPOK-3112	OLD STATE ROUTE 195	36.20	Posted	1929	195	438
SPOK-3620	JAY AVE OV. DRAINAGE	66.54	Posted	1963	27	156
SPOK-3703	COLBERT ROAD	37.44	Posted	1953	90	2004
SPOK-3704	LITTLE SPOKANE DR OV. LITTLE SPOKANE RIVER	35.30	Posted	1951	90	1136
SPOK-3705	SHADY SLOPE OVER LITTLE DEEP	64.91	To be Posted*	1955	20	1421
SPOK-3801	CHATTAROY OV. LITTLE SPOKANE RIVER	45.66	Posted	1953	45	1706
SPOK-3902	DEER PARK MILAN ROAD	47.37	Posted	1954	42	1562
SPOK-4901	ELK-CHATTAROY OV. LITTLE SPOKANE RIVER	36.88	Posted	1962	77	902
SPOK-4902	FRIDEGER ROAD	33.27	Posted	1957	30	289
SPOK-6206	IDAHO RD OV. SF ROCK CREEK	39.94	Posted	1959	42	37

* = Load rated in 2017 with recommendation to post. Hearing for traffic code revision scheduled for April 2018.