



**INDOT**

**Bridge and Culvert Preventative Maintenance Agreement**

**April 27, 2016**

Approved:

  
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Date: 4/27/2016

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INDOT, Engineering & Asset Management  
Business Unit

Concurrence:

  
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Date: 4/28/2016

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## Section 1: General

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### 1.1 Program Description

Bridge and Culvert Preventative Maintenance consists of activities performed on bridge or culvert elements or components that aim to prevent, delay, or mitigate deterioration. Preventative Maintenance actions may be scheduled or condition driven. Preventative Maintenance activities do not entail structural or operational improvements of an existing asset beyond its originally designed strength or capacity.

The goal of the Bridge and Culvert Preventative Maintenance Agreement is to support a strategic, long term program of identifying, programming, budgeting, and completing bridge and culvert preventative maintenance projects to improve the statewide condition of these assets at the lowest possible cost to taxpayers.

The benefits of preventative maintenance will be tracked and reported each year. The benefits of preventative maintenance will be balanced with the overall needs of the bridge system to determine an appropriate funding level for each fiscal year program. An anticipated target range for preventative maintenance will be 10% to 15% of the overall bridge program for the INDOT (State-Owned) Bridge Network.

### 1.2 Benefits

The long-term benefits of the Bridge and Culvert Preventative Maintenance Agreement will be:

1. A reduction in the number of bridges, large culverts, and small culverts with key condition ratings going from good/fair to poor.
2. An overall network increase in the percentage of bridges, large culverts, and small culverts with key condition ratings of fair or better.
3. Support INDOT's mission statement: "INDOT will plan, build, maintain and operate a superior transportation system enhancing safety, mobility and economic growth."
4. Supports INDOT's *Open Roads* (Practical Design) Initiative by implementing low-cost project solutions that enhance the overall condition and function of bridges without sacrificing safety.



### 1.3 Measures

INDOT's network of bridge and large culvert conditions will be determined by INDOT's Bridge Inspection Application System (BIAS) Database. Small culvert conditions will be determined by the Work Management System (WMS).

The Bridge and Culvert Preventative Maintenance Agreement will allow INDOT to maintain structures in good or fair condition and as a component of INDOT's overall structure program will assist with improving the overall condition of INDOT structures. Benefits will be measured annually by assessing condition ratings in the following criteria:

1. A reduction in the number of bridges and culverts with key condition ratings going from good/fair to poor:
  - a. **Bridges:** measure the number of bridges with Wearing Surface, Deck, Superstructure, Substructure, or Culvert rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) during the past year
  - b. **Bridges Under Fill:** measure the number of bridges with Culvert rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) during the past year
  - c. **Large Culverts:** measure the number of culverts with Culvert rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) during the past year
  - d. **Small Culverts:** measure the number of culverts with Culvert rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) during the past year
2. An overall network increase in the percentage of bridges and culverts with key condition ratings of fair or better.
  - a. **Bridges:** measure the percentage of bridges with:
    - i. Wearing Surface rated 5 or higher ( $\geq 5$ )
    - ii. Deck rated 5 or higher ( $\geq 5$ )
    - iii. Superstructure rated 5 or higher ( $\geq 5$ )
    - iv. Substructure rated 5 or higher ( $\geq 5$ )
  - b. **Bridges Under Fill:** measure the percentage of bridges with Culvert rated 5 or higher ( $\geq 5$ )
  - c. **Large Culverts:** measure the percentage of culverts with Culvert rated 5 or higher ( $\geq 5$ )
  - d. **Small Culverts:** measure the percentage of culverts with Culvert rated 5 or higher ( $\geq 5$ )



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## **Section 2: Selection Criteria**

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### **2.1 Available Treatments**

Qualified bridge preventative maintenance treatments are listed in the Indiana Design Manual Chapter 412. Qualified culvert preventative maintenance treatments are listed in Appendix B.

### **2.2 Candidate Project Generation**

Bridges and culverts are inspected on a regular cycle. In general, bridges are inspected by bridge inspection crews on a 2-year cycle, large culverts are inspected by bridge inspection crews on a maximum 5-year cycle based on condition and risk. Small culverts are inspected by Maintenance personnel on a 4-year cycle. Candidates for Preventative Maintenance treatments will be generated from inspection data contained in BIAS, District maintained large culvert databases, and WMS.

Eligibility criteria for bridge preventative maintenance projects are listed in the *Indiana Design Manual* Chapter 412. Eligibility criteria for each culvert preventative maintenance treatments are listed in Appendix B.

### **2.3 Candidate Project Selection and Approval**

The District Bridge Asset Engineer will prepare a list of candidate projects in accordance with the eligibility criteria. Preventative Maintenance projects should not typically be considered if future rehabilitation or complete replacement work is programmed within the life of the preventative maintenance treatment.

The Bridges Division Office of Bridge Asset Management will review the proposed projects for compliance with the eligibility criteria. The final candidate list of proposed projects will be reviewed, prioritized, and approved by the BAMT.

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## **Section 3: Funding**

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Preventative maintenance contracts utilizing treatments detailed in IDM Chapter 412, Figures 412-1A and -1B for Bridges, and Appendix B of this document for culverts are eligible for federal funding. Projects on the NHS are eligible for National Highway Performance Program (NHPP) or Surface Transportation Program (STP) funding; projects not on the NHS are eligible for STP funding.



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## Section 4: Reporting

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At the end of each State fiscal year, the Division of Bridges will prepare a summary report on the results of INDOT's preventative maintenance efforts. As a minimum, the report will include the following:

1. List of structures and treatments by district and designation (des.) number
  - a. Including structure numbers
  - b. Total construction cost per structure number
2. Measures described in *Section 1.3 Measures* tracked over the previous 5 years.

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## Section 5: Supporting Information

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The following sources have been used in support of this procedure:

1. INDOT Procedure for Pavement Preservation Initiative
2. INDOT Small Structure Preservation Program
3. 2008 Annual Report on Condition of INDOT Bridges
4. Programmatic Approach for Pipe Lining Projects (October 2009)
5. INDOT Bridge and Structure Information System
6. INDOT Work Management System
7. IDM Chapter 412 - Bridge Rehabilitation
8. IDM Chapter 203 – Hydraulic and Drainage Design
9. INDOT Crew Leader's Handbook
10. INDOT Project Scoring Guidelines and Business Rules for Bridge and Large Culvert Asset Program (August 27, 2013)
11. FHWA Preventive Maintenance Eligibility memo (October 2004)



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## Section 6: Glossary of Terms

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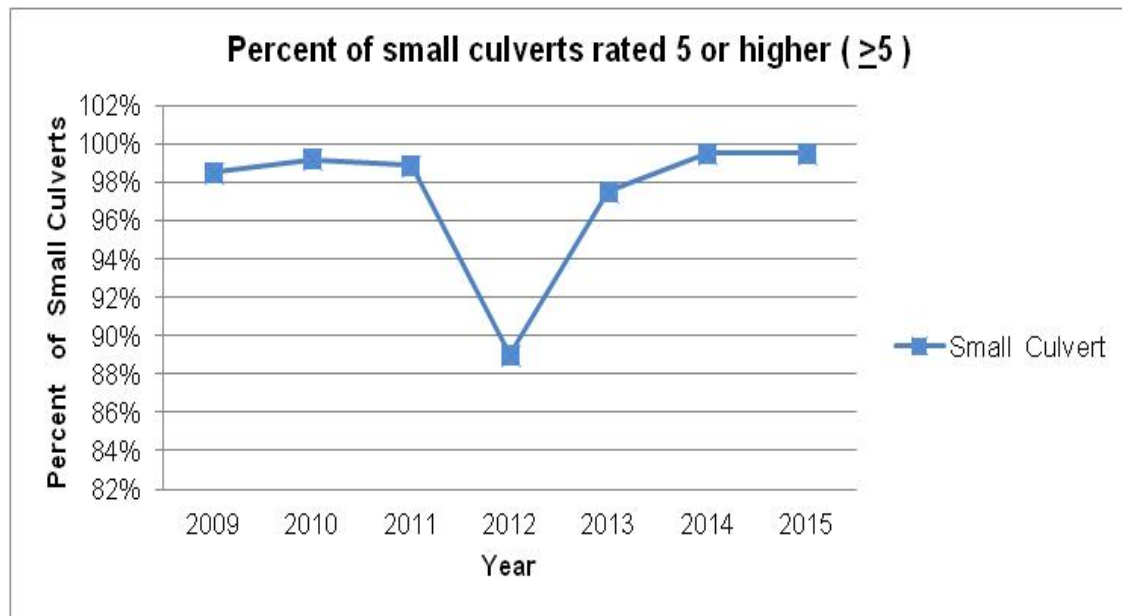
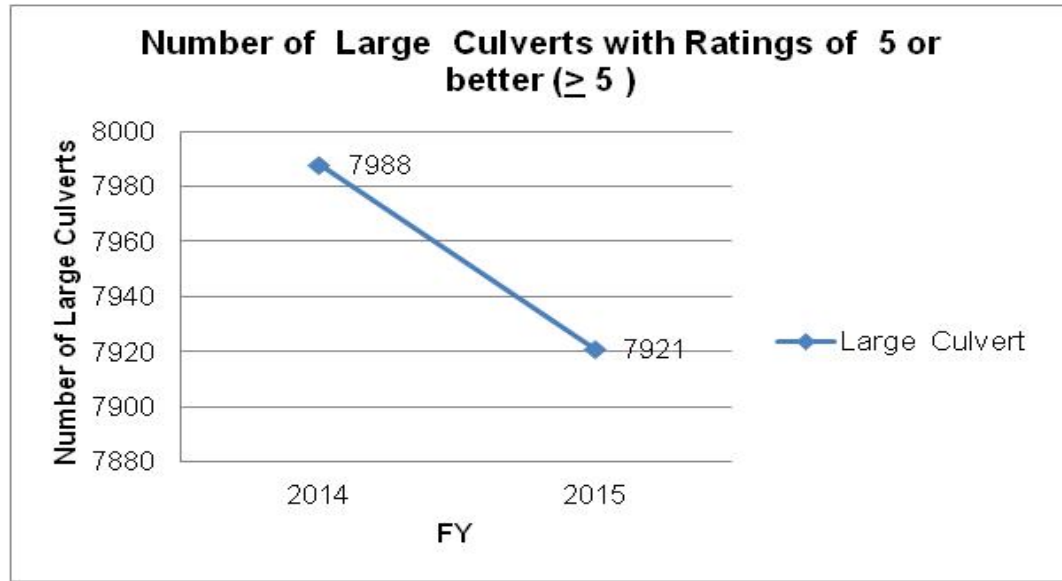
The following is a list of terms and abbreviations used in this document.

<b>BAMT</b>	- Bridge Asset Management Team
<b>BIAS</b>	- Bridge Inspection Application System
<b>Des. Number</b>	- Designation Number, unique project identifier in SPMS
<b>FHWA</b>	- Federal Highway Administration
<b>FY</b>	- Fiscal Year. Indiana's fiscal year runs July 1 thru June 30.
<b>IDM</b>	- <i>Indiana Design Manual</i>
<b>MPO</b>	- Metropolitan Planning Organization
<b>NCPP</b>	- National Center for Pavement Preservation
<b>PM</b>	- Preventative Maintenance
<b>SPMS</b>	- Scheduling Project Management System, INDOT's project scheduling and tracking system
<b>STIP</b>	- Statewide Transportation Improvement Plan
<b>TIP</b>	- Transportation Improvement Program, managed by an MPO



## Appendix A: Sample Reporting of Measures

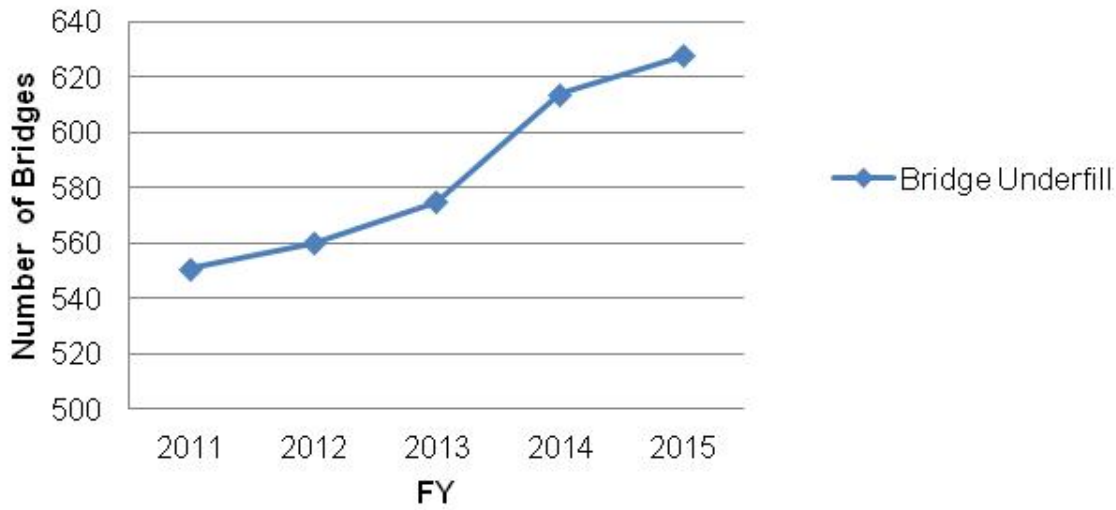
The following are sample charts of the measures to be reported per Sections 1.3 and 4.0.



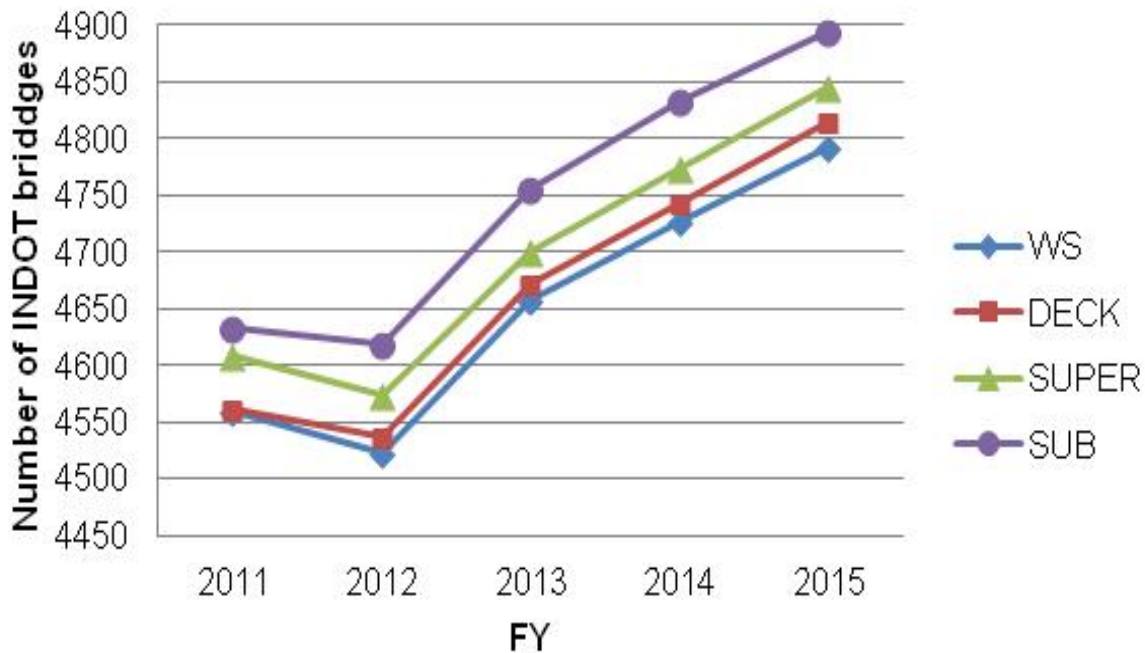




### Number of Bridge Culverts with Culvert Rating of 5 or better ( $\geq 5$ )

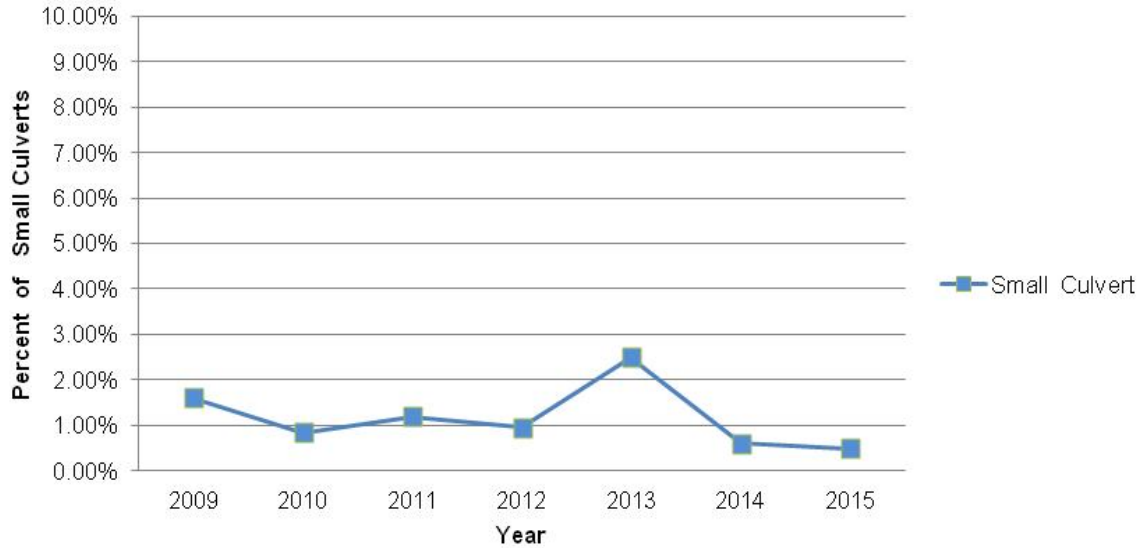


### Number of Bridges (not Bridge Culverts) with Components rated 5 or higher ( $\geq 5$ )

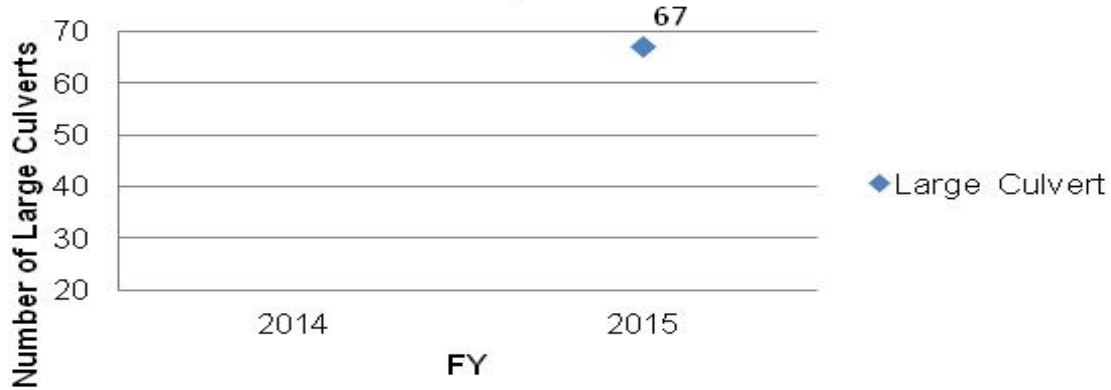




### Percent of small culverts with Culvert Rating that changed from 5 or higher ( $>5$ ) to 4 or below ( $<4$ ) the past year

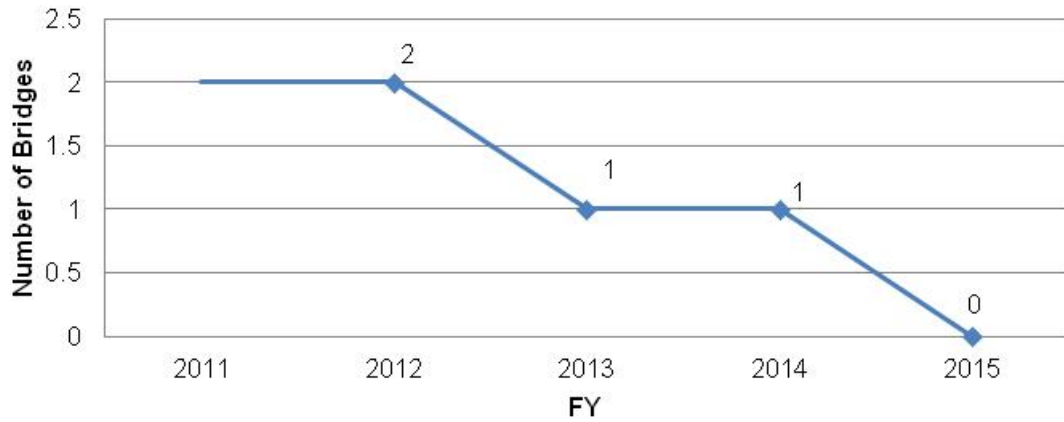


### Number of Large Culverts with rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) the past year

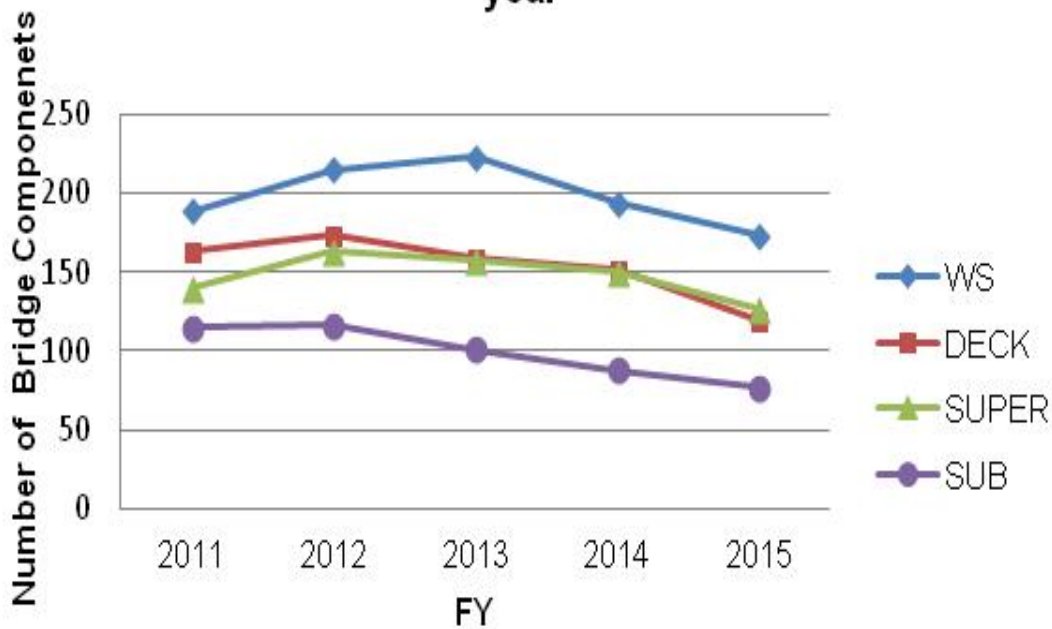




**Number of Bridges with Culvert rating that changed from 5 or higher ( $> 5$ ) to 4 or below ( $< 4$ ) the past year**



**Number of Bridges (not bridge culverts) with Component's Condition rating that changed from 5 or higher ( $\geq 5$ ) to 4 or below ( $\leq 4$ ) the past year**





## Appendix B: Large and Small Culvert Candidate Criteria

### *Large Culvert Candidate Criteria*

Corrective Treatments	Culvert Component	Condition Rating	Barrel/Box or Slab Rating
Culvert Liner (Both Type I & 2 Structures)	Barrel/Box	= 2-5	N/A <sup>(2)</sup>
Structural Patching	Slab/Barrel/Box	> 4	N/A
Scour/Erosion Mitigation	Channel Scour	< 6	> 5
Cutoff Wall Repair/Replacement	Footings	< 6	> 5
Headwall/Wingwall Repair/Replacement	Headwall/Anchors/ Wingwalls	< 6	> 5
Tiedown/Anchor Repair/Replacement	Headwall/Anchors	< 6	> 5
Debris Removal/ Culvert Cleaning	Drift/Sediment/ Unobstructed Flow Box	< 6 ; AND Checkbox "unchecked"	> 5
Paved Invert	Barrel/Box	= 2-5	N/A
Brush Cutting/Herbicide application <sup>(1)</sup>	Embankment	< 6	> 5
Railing Repair <sup>(1)</sup>	Guardrail/Concrete Barrier	< 6	> 5
Upgrading end treatments, guardrail, railing, attenuators <sup>(1)(3)</sup>	N/A	N/A	> 5

(1) Item may only be included in a project incorporating other preservation treatments

(2) Preservation treatment shall raise the condition rating to 5 or higher ( $\geq 5$ )

(3) When found to be cost-effective (See Section 1.0)



**Small Culvert Candidate Criteria**

<b>Corrective Treatments</b>	<b>Culvert Element</b>	<b>Condition Rating</b>	<b>Barrel Rating</b>
Culvert Liner	Culvert Condition	2-5	N/A <sup>(2)</sup>
Structural Patching	Culvert Condition	<6	N/A
Erosion Mitigation	Flowline/End Section	<6	>5
Cutoff Wall Repair/Replacement	Flowline/End Section	<6	>5
Headwall/Wingwall Repair/Replacement	End Section	<6	>5
Tiedown/Anchor Repair/Replacement	End Section	<6	>5
Debris Removal/Culvert Cleaning	Flowline/ Culvert Condition	<6	>5
Brush Cutting/Herbicide Application <sup>(1)</sup>	Embankment	<6	>5
Guardrail Repair <sup>(1)</sup>	N/A	N/A	>5
Upgrading end treatments, guardrail, railing, attenuators <sup>(1)(3)</sup>	N/A	N/A	>5

- (1) Item may only be included in a project incorporating other preservation treatments
- (2) Preservation treatment shall raise the condition rating to 5 or higher ( $\geq 5$ )
- (3) When found to be cost-effective (See Section 1.0)