



INDOT

Bridge and Culvert Preservation Initiative

Policy Statement



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Jason Wasson, Deputy Commissioner of
INDOT, Engineering & Asset Management
Business Unit

Concurrence:

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Richard J. Marquis, Indiana Division Administrator
Federal Highway Administration

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1.0 General

1.1 Program Description

Bridge and Culvert Preservation consists of activities performed on bridge or culvert elements or components that aim to prevent, delay, or mitigate deterioration. Preservation actions may be scheduled or condition driven. Preservation 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 Preservation Initiative (BCPI) is to implement a strategic, long term program of identifying, programming, budgeting, and completing bridge and culvert preservation projects to improve the statewide condition of these assets at the lowest possible cost to taxpayers. BCPI is only one component of INDOT's overall bridge and culvert program, which includes elements of INDOT's capital and maintenance programs, as managed by the Bridge Asset Management Team (BAMT).

The BCPI is subdivided into 3 categories, due to differing inspection and management practices. INDOT's approximate inventory of each category:

1. Bridges and Bridges Under Fill (Span > 20') Approximately 5,500
2. Large Culverts (Span between 4' and 20') Approximately 9,000
3. Small Culverts (Span < 4') Approximately 90,000

1.2 Benefits

The long-term benefits of the BCPI 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 statements: "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 conditions will be determined by INDOT's Bridge Inspection Application System (BIAS) Database. Large culvert conditions will be determined by District maintained large culvert databases. Small culvert conditions will be determined by the Work Management System (WMS).

The BCPI 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 (≥ 5) to 4 or below (≤ 4) the past year
 - b. **Bridges Under Fill:** measure the number of bridges with Culvert rating that changed from 5 or higher (≥ 5) to 4 or below (≤ 4) the past year
 - c. **Large Culverts:** measure the number of culverts with Culvert rating that changed from 5 or higher (≥ 5) to 4 or below (≤ 4) the past year
 - d. **Small Culverts:** measure the number of culverts with Culvert rating that changed from 5 or higher (≥ 5) to 4 or below (≤ 4) 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 (≥ 5)
 - ii. Deck rated 5 or higher (≥ 5)
 - iii. Superstructure rated 5 or higher (≥ 5)
 - iv. Substructure rated 5 or higher (≥ 5)
 - b. **Bridges Under Fill:** measure the percentage of bridges with Culvert rated 5 or higher (≥ 5)
 - c. **Large Culverts:** measure the percentage of culverts with Culvert rated 5 or higher (≥ 5)
 - d. **Small Culverts:** measure the percentage of culverts with Culvert rated 5 or higher (≥ 5)



2.0 Available Treatments

Qualified BCPI treatments may be considered as:

1. **Preventive Maintenance** – Specific activities that are scheduled on a fixed cycle that are intended to maintain a structure at its current level, and prevent or reduce deterioration.
2. **Corrective Maintenance** – Specific activities that are condition driven, intended to correct defects and prevent or reduce deterioration.

2.1 Preventive Maintenance Activities and Treatments

Bridge preventive maintenance activities include:

1. Cleaning/Flushing Bridge Decks
2. Substructure/Superstructure Washing
3. Cleaning Deck Drains
4. Cleaning/Lubricating Bearings
5. Cleaning Joints
6. Deck Sealing

2.2 Corrective Maintenance Treatments

Bridge Corrective Maintenance activities include:

1. Bridge Culvert Liner
2. Deck Patching (shallow/deep) – maximum 10% deck area
3. Approach Slab Repair/Replacement
4. Joint Repair/Replacement
5. Mudwall Patching
6. Thin Deck Overlay (e.g. Polymeric Overlay)
7. Spot Coating
8. Substructure Patching/Sealing
9. Superstructure Crack Mitigation
10. Erosion Mitigation
11. Debris Removal/Channel Cleaning
12. Latex Modified Concrete (LMC) Overlay
13. Slopewall Repair/Replacement
14. Bearing Repair/Replacement
15. Scour Mitigation
16. Deck Crack Sealing
17. Brush Cutting/Herbicide Application*
18. Railing Repair*
19. Relief Joint Repairs*
20. Upgrading end treatments, guardrail, railing, attenuators* **



Large Culvert Corrective Maintenance activities include:

1. Culvert Liner
2. Structural Patching
3. Scour/Erosion Mitigation
4. Cutoff Wall Repair/Replacement
5. Headwall/Wingwall Repair/Replacement
6. Tiedown/Anchor Repair/Replacement
7. Debris Removal/Culvert Cleaning
8. Paved Invert
9. Brush Cutting/Herbicide Application*
10. Railing Repair*
11. Upgrading end treatments, guardrail, railing, attenuators* **

Small Culvert Corrective Maintenance activities include:

1. Culvert Liner
2. Structural Patching
3. Erosion Mitigation
4. Cutoff Wall Repair/Replacement
5. Headwall/wingwall Repair/Replacement
6. Tiedown/Anchor Repair/Replacement
7. Debris Removal/Culvert Cleaning
8. Brush Cutting/Herbicide Application*
9. Guardrail Repair*
10. Upgrading end treatments, guardrail, railing, attenuators* **

*Item may only be included in a project incorporating other preservation treatments

**When found to be cost-effective (See *Section 5.0 Planning and Project Development*)



3.0 Selection Criteria

3.1 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 3-year cycle. Small culverts are inspected by Maintenance personnel on a 4-year cycle. Candidates for preservation treatments will be generated from inspection data contained in BIAS, District maintained large culvert databases, and WMS.

Eligibility criteria for each treatment listed in *Section 2.0 Available Treatments* are listed on the following tables:

3.1.1 Bridge Candidate Selection

3.1.1.1 Bridge Candidate Criteria: Preventative Treatments

Preventive Treatments	Bridge Component	Condition Rating	Cycle (years)
Cleaning/Flushing Bridge Decks	Item 58	>4	1
Substructure/Superstructure Washing	Item 59 ; AND Item 60	>4	1
Cleaning Deck Drains	Item 58	>4	1
Cleaning/Lubricating Bearings	Item 59A	>4	1
Cleaning Joints	Item 58.15 ; AND Item 58.16 ; AND Item 58.16 A; AND Item 58.16 B; AND Item 58.16 C	>4	1
Deck Sealing	Item 58.01 & Item 58.02	>5	5



3.1.1.2 Bridge Candidate Criteria: Corrective Treatments

Corrective Treatments	Bridge Component	Condition Rating	Other Criteria ⁽²⁾
Bridge Culvert Liner	Item 62	= 2-5	N/A ⁽³⁾
Deck Patching (shallow/deep)	Item 58.01	> 4	D/SS > 4 ; AND Maximum 10% Deck Patching
Approach Slab Repair/Replacement	Item 72X.02	< 6	WS/D/SS > 4
Joint Repair/Replacement	Item 58.16	< 6	WS/D/SS > 4
Mudwall Patching	Item 60.02	< 6	WS/D/SS > 4
Thin Deck Overlay (e.g. Polymeric Overlay)	Item 58.01	> 5	D/SS > 4 ; AND Maximum 10% Deck Patching
Spot Coating	Item 59B.01	< 6	WS/D/SS > 4
Substructure Patching/Sealing	Item 60	N/A	WS/D/SS > 4
Superstructure Crack Mitigation	Item 59A.06 ; OR Item 59A.07	Check Box Indicating Cracks	WS/D/SS > 4
Erosion Mitigation	Item 61	< 6	WS/D/SS > 4
Debris Removal/Channel Cleaning	Item 61.03	< 6	WS/D/SS > 4
Latex Modified Concrete (LMC) Overlay	Item 58.01	> 3	D/SS > 5 ; AND Maximum 15% Deck Patching
Slopedwall Repair/Replacement	Item 60	< 6	WS/D/SS > 4
Bearing Repair/Replacement	Item 59A	< 6	WS/D/SS > 4
Scour Mitigation	Item 113	= 2-3	Not Programmed for Bridge Replacement
Deck Crack Sealing	Item 58.01	> 5	D/SS > 5
Brush Cutting/Herbicide Application ⁽¹⁾	Deficiency Noted	N/A	WS/D/SS > 4
Railing Repair ⁽¹⁾	Deficiency Noted	N/A	WS/D/SS > 4
Relief Joint Repairs ⁽¹⁾	Item 72X.03	< 6	WS/D/SS > 4
Upgrading end treatments, guardrail, railing, attenuators ⁽¹⁾⁽⁴⁾	N/A	N/A	WS/D/SS > 4

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

(2) WS = Wearing Surface (58.01); D = Deck (58); SS = Superstructure (59) AND Substructure (60)

(3) Preservation treatment shall raise the condition rating to 5 or higher (≥ 5)

(4) When found to be cost-effective (See *Section 5.0 Planning and Project Development*)



3.1.2 Large Culvert Candidate Selection

3.1.2.1 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 ⁽²⁾
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/Un obstructed Flow Box	< 6 ; AND Checkbox "unchecked"	> 5
Paved Invert	Barrel/Box	= 2-5	N/A
Brush Cutting/Herbicide application ⁽¹⁾	Embankment	< 6	> 5
Railing Repair ⁽¹⁾	Guardrail/Concrete Barrier	< 6	> 5
Upgrading end treatments, guardrail, railing, attenuators ⁽¹⁾⁽³⁾	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 (≥ 5)

(3) When found to be cost-effective (See *Section 5.0 Planning and Project Development*)



3.1.3 Small Culvert Candidate Selection

3.1.3.1 Small Culvert Candidate Criteria

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

(3) When found to be cost-effective (See *Section 5.0 Planning and Project Development*)



3.2 Candidate Project Selection and Approval

The Central Office Division of Bridges will prepare a candidate list of BCPI projects from the appropriate databases. The District Bridge Asset Management (BAM) Engineer will review the candidate project list and develop a list of proposed structures and treatments from the candidate project list or develop a list of proposed structures and treatments using their own methodology. Regardless of the methodology used to develop the list of proposed projects, all structures must meet the criteria identified for the treatment(s) proposed. Preservation projects should not typically be considered if future rehabilitation or complete replacement work is programmed within the life of the preservation treatment.

The District BAM Engineer will rank the projects on their list according to priority and the method of performing the work (INDOT work forces or contract). After the candidate projects are approved by the appropriate District Management, the Bridge Asset Management office within the Bridge Division will review the proposed projects for compliance with the BCPI policy statement. The final candidate list of proposed projects will be reviewed and approved by the BAMT according to Section VII. "Exception to the Rules for Scoring" and prioritized to match the available funding.

The approved candidate list will be submitted to the Project Management Group (PMG) and Executive Funds Team (EFT) for approval.



4.0 Funding

BCPI contracts utilizing treatments detailed in Sections 2.1 and 2.2 are eligible for federal funding. Because INDOT and FHWA do not have a Force Account Cost Effectiveness Determination Agreement covering the treatments detailed in Sections 2.1 and 2.2, projects performed by INDOT forces are not 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 Surface Transportation Program (STP) funding.

5.0 Planning and Project Development

Once project are approved, Districts will be notified to input their respective approved and funded projects in the Scheduling Project Management System (SPMS). All BCPI contracts must be programmed in SPMS; and be included in the State Transportation Improvement Plan (STIP) and TIP if in a Metropolitan Planning Organization. For bridge and large culvert projects, a separate DES number will be programmed for each structure.

Districts are generally responsible for developing the approved list of structures and treatments into projects and contracts. All INDOT contracting procedures, NEPA, ROW, permitting requirements, *Indiana Design Manual*, and *INDOT Standard Specifications* are applicable to BCPI projects.

BCPI projects should consider appropriate means to maintain or enhance the current level of safety. Isolated or obvious deficiencies should always be addressed. Safety enhancements such as the installation or upgrading of guardrail and end treatments/impact attenuators should be encouraged and included in projects where they are determined to be a cost-effective way to improve safety. In no way should BCPI projects adversely impact the safety of the traveled way or its users.

BCPI projects will use SPMS program class "Bridge/Culvert Preservation Initiative" and the FMIS Improvement Code "Bridge Preservation".

The Bridge Rehabilitation Office of the Bridge Division will be involved during the scoping process by attending field checks, assisting and advising the District BAM Engineer to ensure the proper scope of work is recommended. As a minimum, the Bridge Rehabilitation Office will review and approve the scope of work for all Latex Modified Concrete Overlay projects.

All other SPMS entries and programming requirements for contract work should be the same as for any other structure project (NBI#, location, RP's, work type, etc.).



6.0 Reporting

At the end of each State fiscal year, the Division of Bridges will prepare a summary report on the status of this initiative. As a minimum, the report will include the following:

1. List of structures and treatments by District and contract
 - a) Including structure numbers
 - b) Total contract and unit costs
2. Measures described in *Section 1.3 Measures* tracked over the previous 5 years.

7.0 Supporting Information

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)



8.0 Glossary of Terms

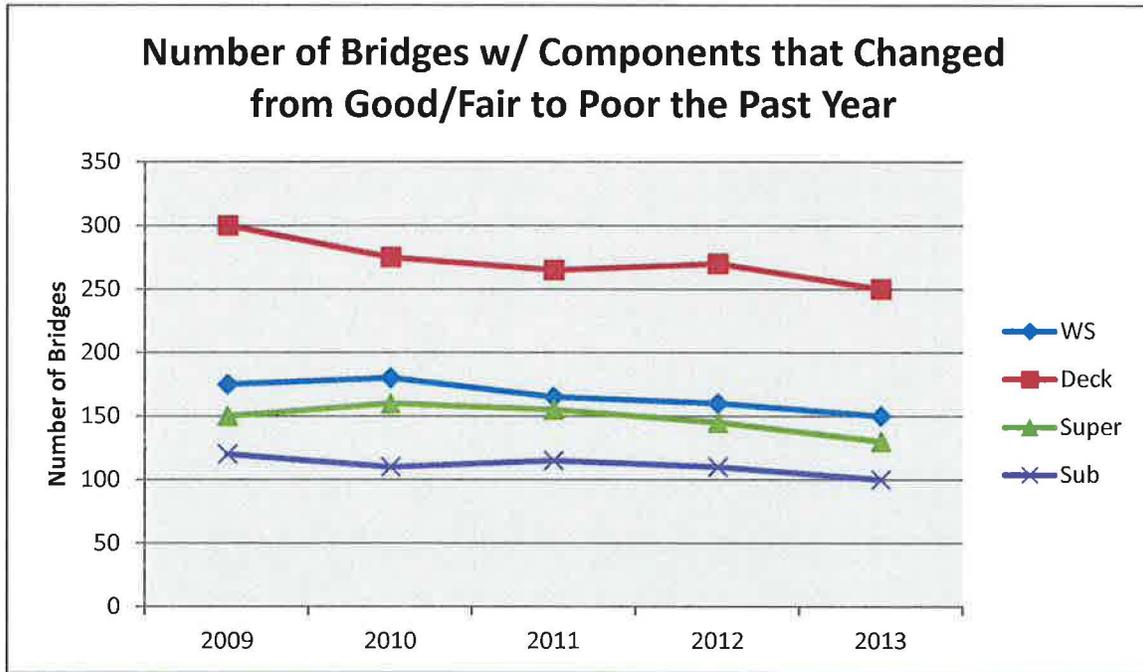
The following is a list of terms and abbreviations used in this document.

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

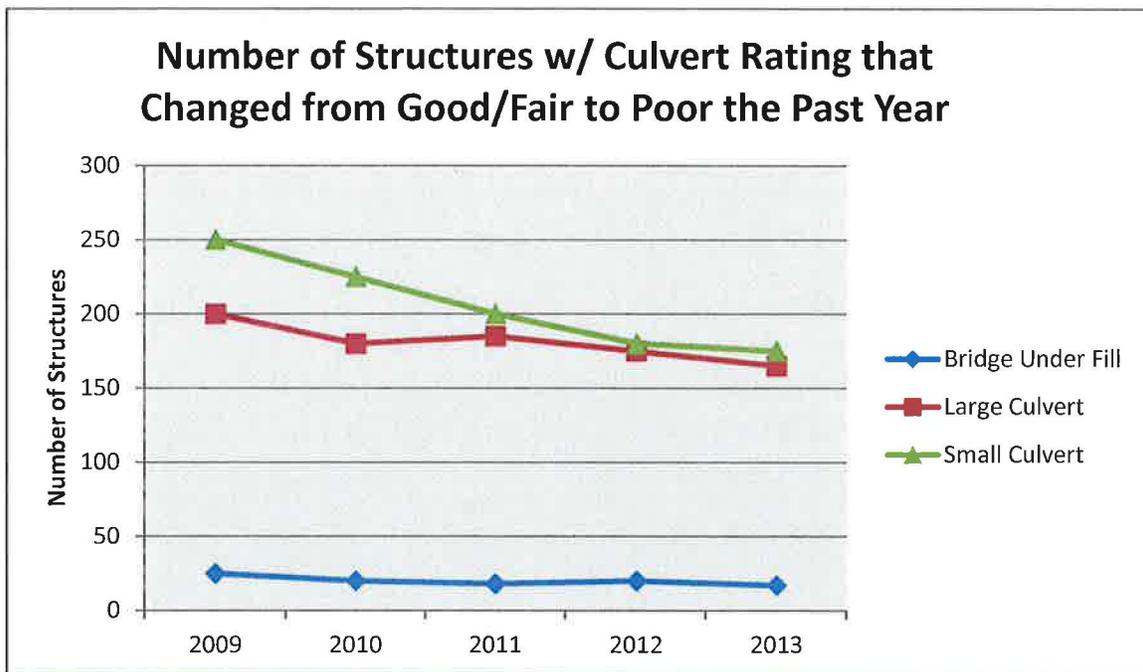
Appendix A: Sample Reporting of Measures

The following are sample charts of the measures to be reported per Sections 0 and 5.0.

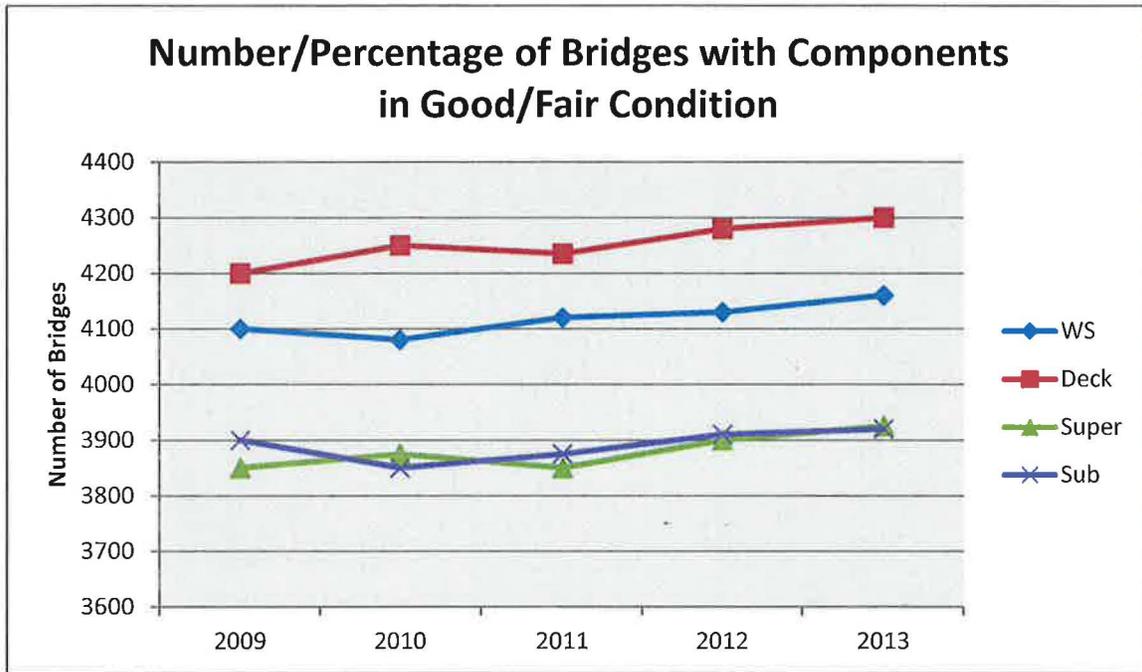
Sample chart per Section 0.1.a.



Sample chart per Sections 0.1.b., 0.1.c., and 0.1.d.



Sample chart per Section 0.2.a.



Sample chart per Section 0.2.b., 0.2.c., and 0.2.d.

