

## Indiana

### **1. Describe the State's bridge maintenance organizational structure and number of personnel.**

52 Employees for whom bridge maintenance is all or part of their assigned duties. Other district personnel

are sometimes employed to perform bridge maintenance tasks.

- Central Office – Bridge and Culvert Field Operations Engineer who provides technical and administrative support to district bridge maintenance personnel.

- Districts (6) – In increasing order of responsibility:

- Bridge Highway Technicians (Labor)
- Crew Leader (Foreman)
- Tech Supervisor (Superintendent)
- Maintenance Supervisor (Manager)

### **2. How are the bridge maintenance activities determined, prioritized, and tracked for completion?**

INDOT divides bridge maintenance activities into two groups, routine and deficiency resolution.

- Routine maintenance activities were determined by a study of best practices performed by Purdue

University. These are generally performed during the appropriate time of year and as time permits.

When the activities are completed it is noted in our Work Management System (WMS) as complete. At the beginning of each fiscal year a work plan is generated by each district which indicates how much of each activity they plan to accomplish during the fiscal year. At the end of the fiscal year the districts are rated on how close they came to meeting their planned goals.

- Deficiency resolution activities are based upon deficiencies discovered by bridge inspectors, other

INDOT personnel, or notification by the traveling public of issues. Each deficiency is assigned a color code priority which has an associated allotted number of calendar days to resolve the deficiency. When the deficiency is resolved it is noted in WMS as complete. Monthly reports are generated indicating the “hit rate” for completing the resolution of deficiencies on time for each district with a goal of 85%. The “hit rate” is cumulative from the beginning to the end of the fiscal

year and starts anew for the next fiscal year. The backlog, deficiencies that have not been resolved

and are past the deadline for resolution, are kept as a running total and do not reset at the beginning

of a new fiscal year.

### **3. What are the typical bridge maintenance actions (work) performed by State Forces, By Contract?**

- State Forces:
  - Bridge Cleaning and Flushing
  - Temporary Bridge Deck Patching
  - Permanent Bridge Deck Patching
  - Bridge Deck Crack Filling
  - Bridge Deck Sealing
  - Joint Replacement
  - Joint Repair
  - Scour Repair
  - Graffiti Removal
  - Slopewall Repair
  - Repair of Railings or Approach Guardrail
  - Repair of Bridge Drainage Components
  - Emergency Bearing Repair/Bridge Seat Repair
  - Debris Removal
  - Bridge Approach Repair
- Contract:
  - Large Debris Pile Removal
  - Bridge Deck Overlays
  - Bridge Deck Replacement
  - Superstructure Replacement
  - Heat Straightening of Beams
  - Substructure Repairs
  - Post-Tensioning Retrofits

### **4. What successful bridge maintenance activities have been utilized by your State that have resulted in extending the service life of an element or bridge?**

- Bridge Cleaning and Flushing
- Permanent Bridge Deck Patching
- Bridge Deck Crack Filling
- Bridge Deck Sealing
- Joint Replacement
- Joint Repair
- Scour Repair
- Slopewall Repair

- Repair of Bridge Drainage Components
- Emergency Bearing Repair/Bridge Seat Repair
- Debris Removal

## Kentucky

**1. Describe the State's bridge maintenance organizational structure and number of personnel.**

Central Office (Division of Maintenance\Bridge Preservation Branch) consists of 15 people  
 Have a \$25 million budget for contracted repairs, painting, and preservation actions  
 We have 12 district offices. The districts do the majority of our bridge inspections on both state maintained and local maintained bridges.  
 Each district has on average one bridge engineer and three bridge inspectors.

Each district has at least one 5 man bridge crew. They have a bridge maintenance budget of approximately \$1 million.

**2. How are bridge maintenance activities determined, prioritized and tracked for completion?**

The bridge engineer in each district sends central office a prioritized list of bridges in need of repairs.

Central office typically spends a minimum of \$1 million in contracted repairs in each district.  
 The bridge engineer generates work orders in the AASHTOWARE Bridge Maintenance for the bridge crews to complete.

**3. What are typical bridge maintenance actions (work) performed by State forces? By Contract?**

State forces are primarily used for concrete deck patching, resealing expansion joints, traffic control, curb and handrail repairs, cleaning gutters and drains, substructure patching, and minor scour countermeasures.

**4. What successful bridge maintenance practices have been utilized by your State that has resulted in extending the service life of an element or bridge?**

In 2010, Kentucky began contracting out preventive maintenance actions. We do three or four corridor projects that consist of 15 to 25 bridges. The preventive maintenance actions include applying a coating of water repellent grease on the steel bearing devices, cleaning and coating the steel beam ends, cleaning the gutters and drains, coating the abutment caps, pier caps, barrier walls, plinth walls, and curbs with an approved water resistant type of paint. All of the above are pressure washed before applying the grease and coating. We spend about \$1 million

a year on this activity. In FY2018, we are scheduled to be able to use \$2 million for contracted preventive maintenance.

Some of our districts have seen how well this is going and are now using their bridge crews to do some of this preventive maintenance.

## Nebraska

**1. Describe the State's bridge maintenance organizational structure and number of personnel.**

Nebraska has 8 districts . Only 3 districts have dedicated bridge maintenance crew ,the other districts operate under district maintenance crew.

**2. How are bridge maintenance activities determined, prioritized and tracked for completion?**

All the routine maintenance activities determined by the inspection crew and sent out to the district right after every inception.

All urgent maintenance activities determined by the district or the inspection crew go thru bridge management team to be prioritized with the district Engineer input and decide whether will be bridge repair only project or let in conjunction with roadway design project if there is a project..

**3. What are typical bridge maintenance actions (work) performed by State forces? By Contract?**

Most routine maintenance and minor repairs done by the state forces otherwise it's by contract . Contracts activities involves bridge deck repairs and overlay (concrete overlay, asphalt with membrane overlay and EPO),bridge rail works, removing abutment backwalls and convert to jointless system structure, replace expansion joints ,repair deteriorated piles ,Asphalt plug joints, joint nosing material ,spot paint etc...

**4. What successful bridge maintenance practices have been utilized by your State that has resulted in extending the service life of an element or bridge?**

Lately, NDOR has gone to Asphalt with membrane overlay system and EPO. NDOR feels those will extend the life of the deck which is the most vulnerable in our state due to salt and environmental impact.

## Ohio

**1. Describe the State's bridge maintenance organizational structure and number of personnel.**

Ohio has a maintenance (in-house) workforce and a planning & engineering staff who scope and plan projects (capital) side. Projects are then administered by construction departments. This is done within each of our 12 districts. The in-house work is performed by Highway Technicians (HT) who perform a myriad of other functions such as snow and ice removal, mowing etc. A minority of districts have a district bridge crew who can perform more specialized repairs.

**2. How are bridge maintenance activities determined, prioritized and tracked for completion?**

Annual bridge inspections are reviewed and approved by a district bridge engineer. The bridge engineer filters the needs to the in-house forces or slates the work for P&E. If the a road is getting paved the district bridge engineer decides what work needs done on the top surface in order to add maintenance needs to that project. Districts are measured by how many deficient Wearing Surfaces, Decks, Paint-Systems and Bridges they have and must keep this number at a minimum (by % of deck area).

**3. What are typical bridge maintenance actions (work) performed by State forces? By Contract?**

In general state forces perform rip-rap placement, deck patching, emergency patching, delam removal over traffic, vegetation removal, resetting bearings, drilling stop-gap holes and cleaning shoulders, scuppers and joints. The remaining, in general, is performed outside.

**4. What successful bridge maintenance practices have been utilized by your State that has resulted in extending the service life of an element or bridge?**

Replacing overlays, replacing decks and repainting.

## Missouri

**1. Describe the State's bridge maintenance organizational structure and number of personnel.**

- a. GHQ Maintenance sets the focus for Preventative Bridge Maintenance Activities at the District Level
- b. GHQ Maintenance staff 2 employees who assist the districts in providing guidance, setting plans and obtaining resources for district bridge maintenance activities.
- c. GHQ Maintenance has pool of special equipment that is shared among the districts to conduct bridge maintenance work.
- d. Each District has a crew or crews of Bridge Maintenance personnel who perform structural repairs to bridges.

- e. The number of dedicated bridge maintenance employees statewide is 92.
  - f. Each District utilizes routine maintenance crews to conduct deck repair, bridge flushing and deck sealing operations.
- 2. How are bridge maintenance activities determined, prioritized and tracked for completion?**
- a. Bridge Maintenance Activities are generally identified when NBI inspections, cyclic maintenance schedule and performance needs.
  - b. Activities are prioritized in order: Safety to Public, ADT and Budget.
  - c. Completion of Activities are entered into MoDOT's TMS system.
- 3. What are typical bridge maintenance actions (work) performed by State forces? By Contract?**
- a. Deck, Superstructure and Substructure Repairs
  - b. Spot Painting of Beam Ends
  - c. Bridge Scour Repairs
  - d. Slope Embankment Repairs
  - e. Bridge Flushing
  - f. Deck Sealing and Crack Filling
  - g. Expansion Joint Repairs
  - h. Bridge Approach Leveling
- All repairs listed above can be done by State Forces or by Contract. Repainting entire superstructures is generally conducted by contract.
- 4. What successful bridge maintenance practices have been utilized by your State that has resulted in extending the service life of an element or bridge?**
- a. Bridge Flushing
  - b. Deck sealing with Silane and Pavon In Deck
  - c. Expansion Joint Repair or Replacement

## Oklahoma

1. Describe the State's bridge maintenance organizational structure and number of personnel. Our State has eight Field Divisions which have dedicated bridge maintenance crews. In urban areas such as Oklahoma City and Tulsa, we use contract maintenance which includes the bridge maintenance.
2. How are bridge maintenance activities determined, prioritized and tracked for completion? Bridges are inspected in accordance with NBIS requirements using PONTIS. Maintenance needs are identified during inspections and are shared with the Field Division and Bridge Division. Prioritization is done by the Field Division. Our maintenance division does tracking of maintenance activities including bridge

maintenance activities using Agile Assets (please refer to the attachment). In addition, our PONTIS bridge inspection reports document repairs.

3. What are typical bridge maintenance actions (work) performed by State forces? According to the ODOT Maintenance Manual, typical activities could include *“Using bridge jacks to reset or replace bearing device and anchor bolts to restore stability, cleaning (removing debris), lubrication, and painting as needed.”* For tracking, we can run a report that pulls every bridge, every work order, and every unit, that used that activity code since 2010.

By Contract? Using funds dedicated to bridge preservation, we typically do paint and joint projects. We have done numerous overlays including latex modified, polymer, and asphalt membrane by contract.

Additionally using State forces and by contract (not necessarily bridge preservation): We do beam ends repair, concrete and/or steel parapet repairs and deck repair/patching.

4. What successful bridge maintenance practices have been utilized by your State that has resulted in extending the service life of an element or bridge? Our biggest successes has been with the paint and joint projects. On a few occasions, we have eliminated joints. We typically do deck sealing on new bridge decks which includes sealing cracks and application of silanes. We have done flood coats and in some cases done flood coats in combination with silane treatments. Research has shown that deck sealing is an effective measure for extending bridge deck life.