

California Department of Transportation

Bridge Preventive Maintenance Program Guidelines

For Local Agencies

December 2015

Background

A January 11, 2002 Federal Highway Administration (FHWA) memo announced that Highway Bridge Program (HBP) funds may be obligated for Preventive Maintenance (PM) on Federal-aid highway bridges (other than bridges on roads classified as local roads or rural minor collectors) under Section 309 of the National Highway System Designation Act of 1995 (codified as 23 United States Code (U.S.C.) 116(d)). According to 23 U.S.C. 116(d), a PM activity is eligible for federal assistance if the State demonstrates to the satisfaction of the Secretary that the activity is a cost-effective means of extending the useful life of a Federal-aid highway.

In August of 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was passed by Congress and signed into law by the President. SAFETEA-LU extended reimbursable systematic bridge preventive maintenance activities to include bridges off the Federal-aid system (local streets and rural minor collectors). Effectively, this means all non-toll public highway bridges with spans greater than 20 feet and toll bridges meeting the requirements of 23 U.S.C. 144(l) are eligible to receive HBP funding for preventive maintenance activities.

On July 6, 2012, Moving Ahead for Progress in the 21st Century Act (MAP-21) was passed by Congress and signed into law. MAP-21 continued PM for bridges under 23 U.S.C. 114(a)(1)(B).

Ineligible Costs – Short Bridges/Culverts, Bridge Railing Upgrade, and Routine Maintenance

Bridges with less than or equal to a 20 foot span are excluded from this program. Federal regulations define minimum spans of bridges that are eligible for HBP funds. See Chapter 6 of the Local Assistance Program Guidelines (LAPG) for detailed information.

Routine maintenance still remains the responsibility of the local agency and is not eligible for HBP or other Federal-aid Highway Program funding. Routine bridge maintenance is defined as regularly scheduled activities to preserve the bridge components in their present or intended condition and generally includes minor work that is normally done by in-house bridge maintenance crews.

Routine bridge maintenance includes, but is not limited to:

1. Repair or replacement of damaged (due to collisions) bridge railing, transition railing, and approach guardrails.
2. Painting over graffiti or graffiti removal.
3. Repair or replacement of warning signs and object markers at approaches.
4. Clearing of brush and overgrowth at bridge ends.
5. Bearing lubrication.
6. Minor concrete repairs (such as concrete spalls).
7. Temporary shoring of bridges for load carrying capacity problems.

Routine bridge maintenance also includes cleaning and flushing deck drains and cleaning/clearing debris from:

1. Deck surfaces.
2. Bridge sidewalks and curbs.
3. Debris removal from channel waterway, except when tied to scour countermeasure projects.
4. Bearing seats, pier caps, and other superstructure elements.
5. Deck joints.

Bridge Preventive Maintenance Program (BPMP) Goals

The BPMP Goals are to:

1. Maintain the existing inventory of bridges in good or fair condition rating. See Definitions for further discussion of good, fair and poor condition ratings.
2. Correct minor structural defects.
3. Correct minor structural deficiencies early in a bridge's life, before a bridge has problems requiring costly rehabilitation, reconstruction or replacement.
4. Extend the service lives of existing bridges.
5. Make efficient use of limited resources.

The BPMP

This program is applicable to bridges with spans greater than 20 feet, owned by local agencies that carry public highways including toll bridges subject to the requirements of 23 U.S.C. 144(e). The minimum requirements are defined in 23 Code of Federal Regulations (C.F.R.) §650.403(a).

PM should be performed at the optimal time or at specified intervals to help preserve the structural condition of bridges or to extend the service life of bridges.

Preservation of structural serviceability is a key element of the program. PM treatments include reducing the amount of water infiltrating the bridge, protecting the bridge elements, slowing the rate of deterioration, and the installation or repair of scour countermeasures.

PM activities should concentrate on treating bridges in fair to good condition and showing no more than minor structural distress.

PM activities should not degrade any safety or geometric aspects of the facility.

Where bridges are either structurally deficient or in poor condition, local agencies are required to identify the deficiencies or safety issue prior to initiating a PM project. The local agency must maintain documentation in their project file justifying the PM work and why the bridge is not being rehabilitated or replaced.

Bridges that are currently programmed for rehabilitation or replacement generally are not eligible for funding under this BPMP. Local agencies may still pursue a PM scope but justification must be documented in the project files for future audit purposes. The work should be limited to the minimum needed to keep the bridge operable until the rehabilitation or replacement project can be advertised. PM activities must be incorporated into and funded as part of regular bridge rehabilitation projects.

PM techniques and strategies selected should be easily constructible in order to minimize traffic disruption and should provide relief from intensive or frequent repair activity.

PM Activities Eligible for HBP Reimbursement

Local agencies must justify PM work for each specific bridge in their project files. A BPMP plan should have multiple bridges with similar work requirements for economical efficiencies. For audit purposes, the records must be maintained by local agencies in compliance with Chapter 5 of the Local Assistance Procedures Manual (LAPM).

Careful evaluation of all deficiencies and work recommendations identified in Bridge Inspection Reports (BIR) is required to properly scope an appropriate preventive maintenance project. Work recommendations documented in the BIR are eligible for reimbursement under the BPMP. Work recommendations not documented in the BIR may be eligible. The evaluation must be included as part of the documentation justifying the PM project.

The following are specific work items eligible for HBP reimbursement under the BPMP Guidelines:

1. Expansion joint reconstruction or replacement. Bridge joint elements in condition states 2, 3 or 4, as shown in the BIR, are eligible, so long as bridge is not in poor condition.
2. Concrete Deck Seals. Deck cracking defect in condition states 2, 3 or 4, as shown in the BIR, are eligible.
3. Concrete deck overlays or similar protective deck overlays. Concrete decks should be field assessed for reinforcing bar cover depths, spalling, delaminations and severe cracking. Deck restoration as required, includes removal of AC and unsound concrete. Full concrete deck replacement is not eligible as a PM activity and may be funded through the general bridge rehabilitation program in Chapter 6 of the LAPG.
4. Deck AC replacement/new installation. AC may be placed on bridge decks for ride-ability, however, a waterproofing system must protect the bridge deck from constant exposure to moisture. Wearing surfaces in condition state 3 or 4, as shown in the BIR, are eligible.
5. Bridge bearings and supports. Restore or replace the existing bearings to make them functional and repair or rehabilitate bearing supports. Bearings in condition states 2, 3 or 4, as shown in the BIR, are eligible.
6. Repair, restoration, and strengthening of major structural elements such as beams, piers, and end caps. Bridge strengthening is to eliminate the need for posting, mitigate further fatigue damage, increase fatigue life, and/or to replace or strengthen main load carrying members.
7. Timber structural elements, timber railings, timber deck runners, timber piles, may be repaired, supplemented, or replaced.

8. Movable bridge mechanical/electrical components that are damaged or worn out may be repaired or replaced.
9. Retrofit repairs to fatigue prone details of steel elements. Steel grid decks may be replaced under BPMP if the rails meet current standards.
10. Spot painting of structural steel elements, including bridge railing where the Paint Condition Index (PCI) is greater than 65. If the PCI is less than 65 (major painting effort), the project will be processed under HBP procedures in Chapter 6 of the LAPG. PM painting cannot be justified for solely aesthetic reasons.
11. Rehabilitation of existing deck drains and erosion control, new installation of deck drainage elements to prevent ponding in traveled lanes. Excludes work required to meet Storm Water Pollution Prevention Plans.
12. Replacement of deteriorated bridge railing. Bridge railing that has deteriorated due to environmental conditions is eligible for replacement and upgrade as PM. The rail must meet current standards. If the rail attachment to the deck cannot meet standards, this work is not BPMP eligible.

The replacement of bridge railing in good condition to upgrade to crash tested standards is not eligible as a PM activity. (Does not extend the service life of the bridge.)
13. Work to correct streambed degradation and localized scour must be related to protecting the structural integrity of the bridge. The construction work must be engineered using current Hydraulic Engineering Circular (HEC) methods.

NOTE:

The installation of new scour countermeasures must also be related to protecting the structural integrity of the bridge and engineered using HEC. However, these projects will NOT be funded through these PM procedures but through the standard HBP process defined in Chapter 6 of the LAPG. These are high priority projects and will receive top priority for funding.

New scour countermeasure projects must have the National Bridge Inventory (NBI) data item 113 rated 4 or less, OR have the Element Level Inspection (ELI) Scour Defect (6000) in condition state 2 or greater, OR have work recommendations in the BIR that recommend scour countermeasure work. These eligibility guidelines supersede scour countermeasure guidelines for eligibility defined in Chapter 6 of the LAPG.

14. Structure Approach Slab rehabilitation/replacement and new installations must be justified in the local agency's project file. This work is eligible if the structural elements of the bridge are damaged due to vehicle impact loading.
15. Other work that can be considered on a case by case basis. Alkali-silica-reactive aggregate mitigation, corrosion management systems, and fracture critical element replacement/rehabilitation will be subject to Structures Maintenance and Investigations (SM&I) and/or Structures Local Assistance (SLA) recommendations.
16. Development of BPMP plans. (See discussion of BPMP plan development under Implementation in these guidelines.)
17. The Department, on a case-by-case basis, can review other scopes of work not documented in the BIR that meet PM objectives. Local agencies must contact their District Local Assistance Engineer (DLAE) for assistance. (DLAEs forward information to Headquarters

(HQ) HBP Managers for approval.)

Project Prioritization

Local agencies must develop objective procedures to prioritize their preventive maintenance projects. These procedures must be included in the project files for review in future audits. The highest priority projects should include scour countermeasures (streambed degradation or localized scour) and the repair, restoration, and strengthening of structural elements.

Priority should be given to bridges that are not eligible for rehabilitation or replacement under the Highway Bridge Program. The intent of the program is to keep these bridges in structurally good condition to maximize their service life and to conserve limited funds available for bridges that do require rehabilitation or replacement.

Design Standards

Design standards for all local assistance projects are defined in Chapter 11 of the LAPM.

Local agencies are required to specify the appropriate design standards in their project files for future audit purposes. This is critical to avoid jeopardizing federal funds and potential tort liabilities against local agencies.

Major scope changes during the performance of PM activities

Local HBP will participate in major scope changes of PM projects provided the local agency can demonstrate the original PM project was properly scoped. When specific bridges within a BPMP plan are no longer BPMP eligible, contact the DLAE for assistance (DLAEs in turn will work with HQ HBP Managers).

In the event that PM scope changes from BPMP eligible work to HBP eligible work, the BPMP plan must be modified for the specific bridge. The BPMP plan will continue to show the specific bridge in it, but only the PE expenditures up to the point when it was determined that the work was not BPMP eligible. A change to the work description must indicate the bridge is not eligible for further BPMP funding. A new HBP project must be processed under HBP procedures in Chapter 6 of the LAPG.

Implementation

Participating local agencies may need to develop a BPMP plan, if they do not have a BPMP plan already programmed. The costs of developing the BPMP plan, including approved indirect costs, is federally reimbursable.

The California Department of Transportation (Department) has set up a lump sum item for “Development of the Bridge Preventive Maintenance Program Plan for Local Agencies” in the statewide portion of the Federal Transportation Improvement Program (FTIP). This allows local agencies throughout the State to hire consultants or fund staff to develop their BPMP plans.

To be reimbursed for developing a BPMP plan, a local agency must submit a letter of request to the DLAE for PE authorization. The letter should address the number of bridges owned by the local

agency and how much funding will be needed to develop the BPMP plan for bridges eligible for PM work. Reimbursable work must commence after the local agency has received notice that the work is authorized. The BPMP plan development is a Preliminary Engineering (PE) only project that must be completed within three years of authorization. Completed development will result in a BPMP plan S approved by the DLAE as described below. If the BPMP plan is not completed within three years, the local agency must pay back the federal funds expended.

The BPMP plan must be submitted to the DLAE in electronic spreadsheet format (refer to the BPMP Plan Template). The highest priority projects will be at the top of the spreadsheet.

Each line in the spreadsheet will represent one bridge. Exhibits 6A and 6D are not to be submitted for BPMPs plans.

Each BPMP plan spreadsheet must include at a minimum:

1. For EACH bridge: The priority for funding (lowest number is highest priority), county geographic location, name of implementing agency, owner, bridge number, Sufficiency Rating, SD status, all PM work descriptions for each bridge, total cost of work described, federal funds, local funds, and total cost of each fund type. (See sample spreadsheet.) The federal reimbursement rate is 88.53% of the eligible project cost.
2. If a local agency wants to be reimbursed for the future costs of developing a BPMP plan, a line in the spreadsheet must be added (priority = 1) that includes the costs to develop future year BPMPs.
3. All references to cost include only PM eligible reimbursable costs: preliminary engineering, indirect costs (See Chapter 5 of the LAPM), Right of Way, construction and construction engineering, and contingency. Contingency is set at 25% of construction costs for programming purposes. (Contingency shall be set at 10% maximum for construction authorization consistent with Chapter 3 of the LAPM.)
4. The Department will accept updated BPMP plans no more than twice a year from local agencies. The DLAE must receive the BPMP plans by September 30th for funds to be obligated in the next FFY year, and January 30th of each year for adjustments. No time extensions will be granted.

The local agency **must have qualified staff** or contract to develop the BPMP plan. Consultant contracting must be in compliance with Chapter 10 of the LAPM. Minimum qualifications for staff or consultants developing the BPMP plan are:

1. Be professionally licensed civil engineers in California.
2. Have expertise in bridge PM treatments.
3. Have expertise in interpreting information in the NBIS BIR, including element level inspection information.

Cities and other local entities may partner with their counties to develop and implement their BPMP plans. If the counties are implementing the BPMP plans for their agencies, the name of the agency implementing the PM in the BPMP plan will be the county even though another agency may own

the bridge. The Department will only execute agreements with the agency implementing the BPMP plan.

Steps to implement the BPMP plans:

1. Local agency staff must perform a detailed review of their bridge inspection reports to determine if there are preventive maintenance work recommendations, based on the BPMP Guidelines.
2. Local agencies must finalize their procedures for prioritizing projects. (A copy must be kept in the project files needed for future audits.)
3. Local agency transmits the BPMP plan with a cover letter certifying compliance with these program guidelines. The electronic copy (any spreadsheet format) should be included with the transmittal letter. The DLAE must receive the BPMP plan by **September 30th** for funds to be obligated in the next FFY year, and **January 30th** of each year for adjustments. **No time extensions will be granted.**
4. Using the BPMP plan, the Department will create a BPMP plan item in the lump sum HBP backup list for each MPO and allocate HBP funds in the lump sum item for each MPO.
5. The Department will provide each MPO the HBP lump sum backup list and each BPMP plan in the MPO's region.
6. The MPOs will amend their FTIPs appropriately.
7. After the FTIP is amended, the BPMP plan may be obligated at the local agency level for all projects included in their BPMP plan. Complex projects should not use the "grouped" PE Federal-aid project number to avoid excessive future paperwork. Local agencies should contact their DLAE for further advice.
8. All Federal-aid requirements in the LAPM must be followed.

Department Oversight

As noted in some of the above items identifying eligible PM work, some Department oversight will be required for complex situations. The Department, in coordination with FHWA, will conduct periodic program reviews or audits to determine compliance with these guidelines and to monitor the performance of the Local Assistance BPMP.

Contact

For questions regarding this program, please contact your District Local Assistance Engineer.

Definitions

3R Standards: See Chapter 11 of the LAPM for a detailed description of these design standards. These standards are utilized where existing facilities are to remain in place without major reconstruction activities.

Bridge: “23C.F.R. § 650.403(a) Bridge. A structure, including supports, erected over a depression or an obstruction, such as water, a highway, or a railway, having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of the openings for multiple boxes; it may include multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening.”

Bridge Inspection Reports (BIR): These reports include various condition ratings of bridges.

Bridge Preventive Maintenance Program (BPMP): A program to allow the local bridge owners to utilize a planned strategy of cost effective treatments to keep bridges and bridge elements in good condition, delay future deterioration and avoid large expenses in bridge reconstruction or replacement.

Bridge Preventive Maintenance Program (BPMP) Plan: A list of preventive maintenance activities and associated cost for bridges that a local agency wants to implement.

Department: California Department of Transportation.

District Local Assistance Engineer (DLAE): The DLAE is the point of contact for local agencies regarding all local assistance projects. Contact information is maintained on the Department’s local assistance web site.

Fair Condition Rating: This is when the lowest rating for a bridge of any of the NBI data items 58-Deck, 59-Superstructure, or 60-Substructure is 5 or 6; or the rating of NBI data item for a culvert, 62-Culvert is 5 or 6.

Federal Transportation Improvement Plan (FTIP): This plan identifies activities to improve transportation in California. The plan must be financially constrained within available revenue.

Good Condition Rating: This is when the lowest rating for a bridge of any of the NBI data items 58-Deck, 59-Superstructure, or 60-Substructure is 7, 8 or 9; or the rating of NBI data item for a culvert, 62-Culvert is 7, 8 or 9.

Local Highway Bridge Program (HBP): Highway Bridge Program authorized under 23 U.S.C. 144. The scope of this program continues to be extended by new legislation to fund preventive maintenance activities.

Local Assistance Program Guidelines (LAPG): This manual describes eligibility requirements for various Federal and State Programs.

Local Assistance Procedures Manual (LAPM): This manual describes the processing procedures and requirements to allow local agencies to be reimbursed for eligible project costs.

Local Agency or Public Authority: The term “public authority” or “local agency” means a federal, state (excluding Department), county, city, town, or township, indian tribe, municipal or other local government or instrumentality with authority to finance, build, operate, or maintain toll or toll-free facilities.

Metropolitan Planning Organization (MPO): These agencies develop regional FTIPs.

National Bridge Inventory (NBI): This is a database of bridges that contains information from the Bridge Inspection Reports.

National Bridge Inspection Standards (NBIS): 23 C.F.R. 650 Subpart C sets the national standards for the proper safety inspection and evaluation of all highway bridges in accordance with 23 United States Code 151.

Paint Condition Index (PCI): The PCI is a 0-100 ranking system that utilizes the current paint condition (called condition states) of the various painted steel elements on a bridge. Data is available from the Department's Structures Maintenance and Investigations web site.

Poor Condition Rating: This is when the lowest rating for a bridge of any of the NBI items 58-Deck, 59-Superstructure, or 60-Substructure is 4 or less; or the rating of NBI item for a culvert, 62-Culvert is 4 or less.

Preventive Maintenance (PM): Preventive maintenance is a planned strategy of cost-effective treatments applied to an existing roadway system and its appurtenances that preserves the system, delays future deterioration, and maintains or improves the functional condition of the system (without substantially increasing structural capacity).

Structures Local Assistance (SLA): An office within the Division of Engineering Services that provides technical support regarding bridge project development activities to the DLAEs and Division of Local Assistance staff.

SMART or PONTIS: These are Bridge Management Systems that enable the electronic collection of bridge ratings and aid in the selection of preventive maintenance projects.

Structures Maintenance and Investigations (SM&I): This office is responsible for implementing the federally-mandated bridge inspection program within the State of California and manages the State's program to preserve, rehabilitate, and replace State owned bridges and locally owned National Highway System bridges.

Structurally Deficient (SD): This is a classification given to a bridge which has significant load carrying elements in poor or worse condition, or the adequacy of the waterway opening provided by the bridge is determined to be insufficient to the point of causing overtopping with intolerable interruptions.