

COST PROPOSAL GUIDELINES
FOR SELF-INSPECTING
LOCAL PUBLIC AGENCIES
PERFORMING BRIDGE INSPECTIONS
REQUESTING REIMBURSEMENT



**Prepared by ADOT Bridge Group and
Reviewed by FHWA and ADOT Local Public Agency Section**

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1. SCOPE

These guidelines provide instruction and procedures for submitting cost proposals for Local Public Agencies (LPA), which perform inspections of bridges that qualify under the National Bridge Inspection Standards (NBIS) and are under the jurisdiction of the agency. Self-Inspecting LPAs requesting federal funds from the Arizona Department of Transportation (ADOT) Bridge Group's Inspection Sub-Program, shall submit cost proposals that meet the requirements of these guidelines for reimbursement of federal funds. These guidelines apply to all structures defined as vehicular bridges located on public roads.

2. BRIDGE INSPECTION AGENCIES

The National Bridge Inspection Standards (NBIS), Code of Federal Regulations, Title 23, Part 650, subpart C (herein referred to as 23 CFR 650.307), statement (a) states that each state transportation department must inspect, or cause to be inspected, all highway bridges located on public roads that are fully or partially located within the state's boundaries, except for bridges that are owned by federal agencies. Title 23 CFR 650.307(d) states that the inspection program may be delegated, but such delegation does not relieve the state transportation department or Federal Highway Administration (FHWA) of its responsibilities.

3. NBIS QUALIFIED BRIDGES AND CULVERTS

NBIS sets the national standard for proper safety inspection and evaluation of bridges and culverts longer than 20 feet in length and located on a public road. A public road is defined in 23 CFR 650.305 as any road or street under the jurisdiction of and maintained by a public authority and open to public travel. NBIS structures do not include railroad bridges, pedestrian bridges, and any other bridges that do not carry public traffic. Any structure that goes over a public roadway requires an under-record.

4. REQUIREMENTS FOR DELEGATED SELF-INSPECTING AGENCIES

Self-inspecting LPAs must comply with the NBIS, Title of 23 CFR 650, Sub-Part C and at a minimum be consistent with the ADOT Bridge Inspection Guidelines.

4.1 Bridge Inspection Program

The LPA must submit written documentation to ADOT's Bridge Management Section detailing their bridge inspection program, quality assurance and quality control procedures.

The LPA Bridge Inspection Program shall conform to the current edition of the AASHTO Manual for Bridge Element Inspection (MBE) and all bridge inspection references, reports and procedures listed in the ADOT Bridge Inspection Guidelines. The ADOT Bridge Inspection Guidelines cover the majority of issues that may be encountered while performing and documenting a bridge inspection in Arizona; however, they are not intended to be exhaustive, nor are they intended to replace the local agency bridge inspection manuals and guidelines. These guidelines are intended to be utilized as the minimum of ADOT's acceptable standard.

ADOT and FHWA will review the documentation for compliance with federal and state requirements prior to granting approval. ADOT is ultimately responsible for the inspection of all

bridges in the state of Arizona, including those conducted by self-inspecting LPAs. If ADOT and FHWA determine the self-inspecting LPA is not in compliance with federal and state requirements, ADOT may implement corrective action measures, place the LPA on probationary status, or revoke the LPA's self-inspection status.

4.2 Bridge Inspection Experience and Training

Bridge inspectors shall have certain qualifications related to bridge inspection experience, education, and training, as stated in 23 CFR 650.309.

ADOT or the self-inspecting LPA, in coordination with the National Highway Institute (NHI) Training Program, will help facilitate and provide bridge inspection refresher training and other relevant trainings that improve the quality of inspections, introduce new techniques, and maintain the consistency of the inspection program.

ADOT, in coordination with the NHI Training Program, will coordinate the following training and inform self-inspecting LPAs of availability:

- A. Two-week Safety Inspection of In-Service Bridges – as needed, based on interest and availability.
- B. Three-day Bridge Inspection Refresher Training – as required by the state (five year cycle, or as class is made available).
- C. Other relevant trainings – as needed, based on interest and availability.

4.3 Bridge Load Rating

23 CFR 650.313(c) requires state agencies to rate each bridge for its safe load-carrying capacity in accordance with the AASHTO MBE, as referenced in 23 CFR 650.317(b). The self-inspecting LPA, whether through in-house staff or consultants, must determine a load rating value that is applicable to maintain the safe use of the bridge and to substantiate posting and permit decisions. Bridge load ratings performed on existing bridges are eligible for federal fund reimbursement.

4.4 Bridge Inspection Reports and Files

23 CFR 650.313(d) requires each agency to prepare bridge files as described in the AASHTO MBE and to maintain reports on the results of bridge inspection together with notations of any actions taken to address the findings of such inspections.

A bridge inspection report is a legal document. Bridge inspectors must make their descriptions concise, specific, detailed, and quantitative (where possible) and complete. The completed inspection report reflects the current bridge conditions and must be printed and signed by the designated bridge inspection team leader who has the responsibility of assuring that the inspection was performed in accordance with NBIS. PE seal is required on the Bridge Inspection Report.

4.5 Reporting of Critical Findings

23 CFR 650.305 states that a critical finding is a structural or safety related deficiency that requires immediate follow-up inspection or action.

Any critical findings discovered during a structure inspection must be reported to ADOT in accordance with the ADOT Bridge Inspection Guidelines, Section 5 – Critical Findings. ADOT will forward these reports to FHWA. FHWA will review the critical follow-up reports prepared by the bridge inspector and track the progress to verify that the self-inspecting LPA promptly reported needed repairs and completed the repairs within a reasonable period. ADOT can find the LPA to be in noncompliance if it fails to do so.

4.6 Field Inspection Data Entry

The self-inspecting LPA shall enter Bridge Elements and NBI data and inspection notes into the AASHTOWare Bridge Management software database (BrM), including digital photos, channel profile/vertical clearance diagrams following the requirements of these guidelines and those mentioned in Section 4 of this document. ADOT will provide BrM access to the self-inspecting LPA. A separate BrM license is not required to be maintained by the LPA and federal funds for the purchase of such a license is not eligible for reimbursement through the ADOT Bridge Inspection Sub-Program.

4.7 Quarterly Progress and Annual Inspection Report Submittal

The self-inspecting LPA utilizing the ADOT Bridge Management provided BrM software shall enter inspections in a timely manner so that ADOT Bridge Management has updated information for quarterly and annual NBI reporting.

The self-inspecting LPA not utilizing the ADOT Bridge Management provided BrM software shall provide, in accordance with prescribed deadlines the following to the ADOT Bridge Management Section:

- A. Quarterly reports shall be submitted.
- B. Annual NBI data in FHWA prescribed text format. Error checking and corrections must be done prior to submittal.
- C. Annual NBI Bridge Elements in FHWA prescribed XML schema based on the AASHTO MBE.
- D. Annual BrM XML export file(s) without customized data fields for import into ADOT Bridge Management's BrM master database.
- E. Annual digital photographs for performed inspections for import into ADOT Bridge Management's BrM.
- F. Annual digital PDF's of performed inspections.

5. STATE/ FEDERAL ASSISTANCE FOR BRIDGE INSPECTION PROGRAM

ADOT will assist a LPA who is approved as a self-inspecting agency with federal funds from ADOT's Bridge Inspection Sub-Program at a maximum to be determined by the department.

In order to qualify and receive federal funds through ADOT 's LPA Section, a cost proposal from the self-inspecting LPA must be submitted by January 31 of each year, detailing the planned

upcoming fiscal year's inspection cycle from July 1st to June 30th. ADOT may recommend financial assistance for bridge inspection for a self-inspecting LPA that is (1) in compliance with these Guidelines and (2) operates under inspection procedures with cost effective inspection plans. ADOT's Bridge Management Section will review the cost proposal and may recommend federal funds if the cost proposal is acceptable to ADOT.

ADOT has the authority to review and ensure reasonable cost-effective estimates and proposals from self-inspecting LPAs if federal funding sources are involved. The purpose of the review is to ensure inspection methods and related work is compliant with federal regulations.

An IGA will be required to be established through ADOT's Joint Project Agreement (JPA) Section, prior to the upcoming Fiscal Year and renewed each year thereafter, with updated estimates for each inspection project. Separate IGA's are required for both On-System and Off-System bridges, as defined by FHWA, due to the separate federal funding sources.

The self-inspecting LPA should plan accordingly to meet all inspection cycle deadlines during the cost proposal's review and negotiation process and obligation of funds through the establishment of an inspection project through ADOT's LPA Section. Inspections performed prior to authorization, will not qualify for federal fund reimbursement. The submission of a cost proposal for eligible bridge inspection activities is not a guarantee of funding. Based on the availability and demand of federal funds within the subprogram, the Department may not be able to fund all the needs on a year-to-year basis.

6. INSPECTION SCOPE & HOURS

The following information is required by ADOT if the LPA is requesting federal funding reimbursement to perform LPA Bridge Inspection Work.

Self-inspection LPAs may submit a cost proposal for federal funds to inspect NBIS structures. The following bridges and structures qualify for federal funds:

- A. NBIS qualified bridges and culverts located on public roads for vehicular travel shall be included in the inspection program for requesting federal funding.
- B. Structures that require under-record also qualify for federal funds.

The cost proposal for hours necessary to complete the task of inspection and reporting must be broken down into categories, such as preparation/mobilization, travel, field inspection, reporting, quality control/assurance, and miscellaneous items (i.e., administration, printing, mailing, unforeseen interruption, etc.). Each bridge should be identified by listing structure number (N8), structure name (A209), facility carry (N7), feature intersected (N6A), material (N43A), design (N43B), length (N49), width (N52), inspection frequency (N91), next inspection (A228), inspection labor(total hours as indicated above/cost), lift equipment (type/cost), traffic control (type/cost) and water access (type/cost).

The cost proposal shall be broken out into both On-System and Off-System inspection estimates.

To ensure cost effective bridge inspections with optimum use of equipment, traffic control, and other resources, ADOT encourages the following for consideration.

- A. Routine inspection of bridges and culverts should include four or more structures per day if feasible.
- B. In-depth inspection of bridges should normally include two or more structures per day. Very large, complicated or other special structures shall have the in-depth inspection based on a reasonable scope of work.
- C. Equipment rental and traffic control arrangements should be coordinated in the most cost effective method if feasible.

In general, hours may be based on the length of the bridge and time required to complete the bridge inspection according to in-house and on-call consultant inspection history. In general, an inspection scope and hour breakdown may be based on the length of the bridge and type of inspection, as shown in the tables below. Significant deviations from the suggested hours and scope of the inspection items as stated in these guidelines will require justification and approval by ADOT prior to submitting a cost proposal.

6.1 Routine/Visual/Initial Inspections

Bridges Length/ft	Mobilization	Travel	Inspection	Report, QA/QC	Misc.	Total Hours
<250	1	1	1	3	1	7
250 - 1000	1	1	2	3	2	9
1000 - 2000	1	1	4	3	2	11
>2000	1	1	8	4	2	16
Culverts, # of Barrels	Mobilization	Travel	Inspection	Report, QA/QC	Misc.	Total Hours
≤3	1	1	1	2	1	6
>3	1	1	2	2	1	7

Note: Bridges greater than 2000 feet shall be adjusted to reflect an additional hour for every 500 feet of additional length, in the inspection estimate. Initial inspections may include an additional hour to be included under the Report, QA/QC portion of the estimate to account for full data entry of inspection items. Initial inspections of new bridges shall be noted in the estimate.

6.2 In-Depth/Close-Up Inspections

Bridges Length/ft	Mobilization	Travel	Inspection	Report, QA/QC	Misc.	Total Hours
<250	2	1	3	3	1	10
250 - 1000	3	1	4	4	2	14
1000 - 2000	4	1	6	5	3	19
>2000	4	1	10	6	3	24

7. TYPES OF BRIDGE INSPECTIONS ELIGIBLE FOR FEDERAL FUNDS

ADOT establishes the following definitions for the various types of bridge inspections and procedures based on 23 CFR 650.305. Cost proposals submitted to ADOT shall reflect these items of work and include allowances for unforeseen items such as Initial, Damage and Special inspections listed below.

Justification shall be provided for items of work that are beyond the limits provided in these guidelines and supplement the cost proposal. It is suggested that the LPA coordinate with ADOT Bridge Management Section on any questions or deviations from these guidelines prior to submitting a cost proposal.

7.1 Initial Inspection

The first inspection of a bridge as it becomes a part of the bridge file to provide all Structure Inventory and Appraisal (SI & A) data, element level data and to determine baseline structural conditions.

7.2 Routine Inspection

A regularly scheduled inspection consisting of observations and/or measurements needed to determine the physical and functional condition of the bridge, to identify any changes from initial or previously recorded conditions, and to ensure that the structure continues to satisfy present service requirements.

These inspections are generally conducted from the deck; ground levels, water levels, or both; and permanent work platforms and walkways, if present. Inspection of underwater portions of the substructure is limited to observations during low-flow periods, probing for signs of undermining, or both. The self-inspecting LPA should schedule the bridge inspection during dry periods, if feasible. This inspection may be performed at intervals of 12, 24 or 48 month intervals depending on bridge conditions, to minimize the risk of bridge failure. In Arizona, bridges are routinely inspected at 24-month intervals and most culverts are inspected at 48-month intervals. Bridges with higher risk may be inspected at a 12-month interval or more often as determined by prudent bridge inspection practices or by LPA operations.

7.2.1 Inspection Equipment

- A. Under-bridge inspection equipment (snooper or main-lift) is not required for routine inspection of bridges that can be accessed from underneath and have an under-clearance height of less than 30 feet. Other equipment, such as ladder and binoculars, may be used to help visual inspection if the under-clearance height is less than 30 feet.
- B. Under-bridge inspection equipment may be used if the under-clearance height is greater than or equal to 30 feet and cannot be accessed from underneath.
- C. Concrete structures with conditions described in Section 7.3 may warrant the use of under-bridge inspection equipment for in-depth inspection.

7.2.2 Chain Dragging

- A. The deck may be inspected from the sidewalk, shoulder, median, or center left/right turn lane, if they exist. No chain dragging, with or without traffic control, is required for a deck

having asphalt concrete (AC) or some type of overlay or bare concrete with a National Bridge Inventory (NBI) rating greater than 5.

- B. If the NBI rating of the deck is equal to or less than 5, chain dragging, with or without traffic control, is permitted.

7.2.3 Traffic Control

- A. The need for traffic control for routine inspection shall be determined by the LPA based on the local self-inspecting agency's internal traffic safety policy. However, if the bridge has access through a sidewalk, shoulder, median, or center left/right turn lane, the need for traffic control must be justified.
- B. Traffic control may be required when under-bridge inspection equipment is utilized for under clearance heights greater than or equal to 30 feet.
- C. Traffic control may be required for chain dragging based on the deck condition in the areas of high traffic, poor sight distance or other safety reasons.
- D. If required by local government ordinances, policies, and regulations, some bridge inspections may necessitate traffic control. Justification must be provided if traffic control is required.

7.2.4 Workboat

- A. Waterway/Canal bridges should be inspected during the dry season or at low-flow periods using waders for access if necessary and where safety considerations allow.
- B. For bridges without water, routine inspections can be easily achieved visually with or without a ladder. A man-lift or bucket truck is not required to perform routine inspections unless the under-clearance height is greater than or equal to 30 feet.
- C. Full water flowing waterway/canal bridges (water levels of 18 inches or deeper) with no dry season may be inspected using a boat if there is ample space (minimum clearance of 3 feet) for the boat and the inspector under the bridge. Clearances less than 3 feet may utilize boats to gain access to edges of the structure to provide an assessment of bridge elements that are visible but inaccessible. If a waterway/canal bridge carries a high current or flow, safely performing the inspection with the use of a boat should be planned and coordinated to ensure a safe and effective inspection.

7.3 In-depth Inspection

7.3.1 Steel Structures

A hands-on (arm's length) inspection may be performed on one or more members of steel structures above or below the water line to identify any deficiencies not readily detectable using routine inspection procedures. In-depth inspections are to be performed at the direction of the bridge owner or program manager.

Traffic control and special equipment, such as under-bridge inspection equipment (snooper or man-lift) and workboats, may be used to obtain access, if needed. To ascertain the existence of or the extent of any deficiencies, a nondestructive field test, other material test, or both may need to be performed.

- A. A hands-on (arm's length) inspection is performed on one or more members of steel structures. ADOT performs in-depth inspection of steel structures every four years.
- B. Bridges with steel fracture critical members (FCMs) require an in-depth inspection every 24 months.

7.3.2 Concrete Structures

A hands-on (arm's length) inspection may be performed on any concrete structure whose current condition rating of the deck, superstructure or substructure is less than 5. A concrete structure with members or elements that exhibit signs of distress/crack patterns, severe deterioration and/or damage that will affect the integrity of the structure or reduce the load-carrying capacity of the structure may also warrant a hands-on inspection.

- A. In general, an in-depth inspection is not required for concrete structures. But ADOT will allow an in-depth inspection frequency of concrete bridges in an 8-year cycle, if a self-inspecting LPA would like to perform in-depth inspection of concrete structures.
- B. The in-depth inspection frequency of concrete bridges may be reduced to a more frequent cycle if any of the follow conditions exist:
 - 1. The previous inspection of the concrete structure resulted in an NBI rating of the deck, superstructure, or substructure less than 5.
 - 2. Members/elements exhibit signs of distress/crack patterns, severe deterioration, or damage that will impact the integrity of the structure or reduce the load-carrying capacity of the structure. In this case, a hands-on inspection using access equipment, with or without traffic control, may be required.
- C. ADOT has no restriction if a self-inspecting LPA chooses to follow its own procedures in compliance with NBIS for the inspection of concrete structures with its own funding.

7.3.3 Special Access Equipment

Snoopers, man-lifts, bucket trucks, and workboats shall be used based on the nature of the bridge and their appropriateness based on the following criteria.

- A. A snooper may be used if there is no access under the bridge or the under-clearance height is more than 30 feet. A man-lift or bucket truck may be used for an under-clearance height less than 30 feet, if needed. A ladder may be used for an under-clearance height less than 20 feet.
- B. If there is access under the bridge (including canal bridges without water), a ladder, man-lift, or bucket truck may be used, if needed. It is cost effective to coordinate multiple bridge inspections when renting and utilizing a man-lift truck or bucket truck on a weekly or monthly basis.
- C. Full water flowing canal bridges with no dry season may be inspected using a boat if there is ample space for the boat and inspector under the bridge.

7.3.4 Traffic Control

- A. In general, traffic control may be used for those bridges where under-bridge inspection equipment is needed.
- B. If a snooper is used on a bridge, traffic control may be used on the bridge. If a snooper is used for an underpass bridge, traffic control may be used on the bridge and/or under the bridge.
- C. If a man-lift or bucket truck is used for a river/channel bridge, traffic control is not normally required under the bridge. Special exceptions might require traffic control, such as busy traffic on a maintenance canal road that also crosses the bridge.
- D. If a bucket truck is used for an underpass bridge, traffic control may be used for under the bridge.

7.4 Special Inspection

An inspection scheduled at the discretion of the bridge owner, used to monitor a particular known or suspected deficiency is considered a “special inspection”. Special inspections include FCM inspections, underwater inspections, and scour inspections. Special inspections may be performed on an “as needed” basis.

7.5 Damage Inspection

An unscheduled inspection to assess structural damage resulting from environmental factors (e.g., flooding, fire, deterioration, etc.) or human actions (e.g., traffic impact, vandalism, fire, overloads, explosions, etc.) is considered a “damage inspection”. Damage inspections may be performed as needed and must be reported to ADOT and FHWA within 48 hours.

7.6 Fracture Critical Member (FCM) Inspection

A hands-on inspection of a FCM or member components that includes visual and possibly other nondestructive evaluation is considered a “fracture member inspection”. FCMs are to be inspected at intervals not to exceed 24 months and should always be scheduled to be performed concurrently with a routine inspection. Criteria are to be established to determine the level and frequency to which these members are inspected, considering such factors as age, traffic characteristics, and known deficiencies. FCM inspections are performed following the plans and procedures established for in-depth inspection.

7.7 Underwater Inspection

Inspection of the underwater portion of a bridge substructure and the surrounding channel, which cannot be inspected visually at low water by wading or probing, generally requires diving or other appropriate techniques. Inspect underwater structural elements at regular intervals not to exceed 60 months.