

# Bridge Performance Measurement

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## Asset Type: Bridges

### Scope of Data Included in Performance Measure

Bridges are required to satisfy both Moving Ahead for Progress in 21st Century (MAP-21) and the California Government Code requirements. Accordingly, there are two distinct reporting scopes.

For MAP-21 reporting, the scope of this measure will be all National Bridge Inventory (NBI) bridges that carry the National Highway System (NHS) on the deck of the bridge regardless of ownership. This will include all closed local agency owned NBI bridges. The summary reporting will be broken down by State or Local Agency ownership with total for the inventory and each condition category.

For the California Government Code reporting, this measure will include all State Highway System (SHS) bridges that carry vehicular traffic. This will include all overcrossing structures and bridges that carry the SHS that are shorter than the limits established by the Federal Highway Administration for the NBI.

### Data Update Frequency

The bridge condition data is updated on an ongoing basis with most bridges receiving an inspection once every two years. Approximately 1000 bridges owned by the state and local agencies statewide are inspected in any given month. Data update frequency as requested.

### Summary of Performance Measure

The bridge condition will be weighted by bridge deck area and will be classified into categories of Good, Fair and Poor as defined by the Federal Highway Administration (FHWA) for MAP-21 reporting. Refer to CFR 490 Subpart D – National Performance Measures for Assessing Bridge Condition. *The proposed rule may change prior the final rule being published in the Code of Federal Regulations.*

### Performance Measure Calculation Detail

The calculation method for determining Good, Fair or Poor condition bridges is established in the FHWA Notice of Proposed Rule Making for bridge and pavement performance measurement as follows:

Calculation of national performance management measures for assessing bridge condition.

(a) The bridge performance measures shall be calculated in accordance with this section and used by State DOTs and MPOs to carry out the bridge condition related requirements of this part.

(b) The condition of bridges on the NHS, including bridges on ramps connecting to the NHS, shall be classified as Good, Fair, or Poor following the criteria specified in this paragraph. The assignment of a classification of Good, Fair, or Poor shall be based on the bridge's condition ratings for NBI Items 58—Deck, 59—Superstructure, 60—Substructure, and 62—Culverts. For the purposes of national performance measures under the NHPP, the method of assessment to determine the classification of a bridge will be the minimum of condition rating method, i.e., the condition ratings for lowest rating of a bridge's 3 NBI Items, 58—Deck, 59—Superstructure, and 60—Substructure, and will determine the classification of a bridge. For culverts, the rating of its NBI Item, 62—Culverts, will determine its classification. The NHS bridges will be classified as Good, Fair, or Poor based on the following criteria:

(1) Good: When the lowest rating of any of the 3 NBI items for a bridge (Items 58—Deck, 59—Superstructure, 60—Substructure) is 7, 8 or 9, the bridge will be classified as Good. When the rating of NBI item for a culvert (Item 62—Culverts) is 7, 8, or 9, the culvert will be classified as Good.

(2) Fair: When the lowest rating of any of the 3 NBI items for a bridge is 5 or 6, the bridge will be classified as Fair. When the rating of NBI item for a culvert is 5 or 6, the culvert will be classified as Fair.

(3) Poor: When the lowest rating of any of the 3 NBI items for a bridge is 4, 3, 2, 1, or 0, the bridge will be classified as Poor. When the rating of NBI item for a culvert is 4, 3, 2, 1, or 0, the culvert will be classified as Poor.

(c) The bridge performance measures shall be calculated for the applicable bridges per paragraph (a) of this section that pertain to each target established by the State DOT or MPO in § 490.105(e) and (f), respectively, as follows:

(1) The performance measure for the Percentage of bridges classified as in Good condition shall be computed and reported to the one tenth of a percent as follows:

$$\frac{\sum^{\text{GOOD}} [\text{length x width}]_{\text{Bridge } p}}{\sum^{\text{TOTAL}} [\text{length x width}]_{\text{Bridge } s}}$$

Where:

**GOOD** = total number of the applicable bridges, where their condition is Good per paragraph (b)(1) of this section;

**g** = a bridge determined to be in Good condition per paragraph (b)(1) of this section;

**Length** = corresponding value of NBI Item 49—Structure Length for every applicable bridge;

**Width** = corresponding value of NBI Item 52—Deck Width or value of Item 32 Approach Roadway Width for culverts where the roadway is on a fill [i.e., traffic does not directly run on the top slab (or wearing surface) of the culvert] and the headwalls do not affect the flow of traffic for every applicable bridge.

**s** = an applicable bridge per paragraph (b) of this section; and

**TOTAL** = total number of the applicable bridges specified in paragraph (b) of this section.

(2) The performance measure for the Percentage of bridges classified as in Poor condition shall be computed and reported to the one tenth of a percent as follows:

$$\frac{\sum^{\text{POOR}} [\text{length x width}]_{\text{Bridge } p}}{\sum^{\text{TOTAL}} [\text{length x width}]_{\text{Bridge } s}}$$

Where:

**POOR** = total number of the applicable bridges, where their condition is Poor per paragraph (b)(3) of this section;

**p** = a bridge determined to be in Poor condition per paragraph (b)(3) of this section;

**Length** = corresponding value of NBI Item 49—Structure Length for every applicable bridge;

**Width** = corresponding value of NBI Item 52—Deck Width or value of Item 32 Approach Roadway Width for culverts where the roadway is on a fill [i.e., traffic does not directly run on the top slab (or wearing surface) of the culvert] and the headwalls do not affect the flow of traffic for every applicable bridge.

**s** = an applicable bridge per paragraph (b) of this section; and

**TOTAL** = total number of the applicable bridges specified in paragraph (b) of this section.