

Explanation of Bridge Sufficiency Rating

The Sufficiency Rating (SR) of a bridge is a method established by the Federal government (FHWA) to evaluate the large inventory of bridges in the USA. The evaluation is done with a formula that looks at four (4) separate factors and obtains a numeric value that is indicative of a particular bridge's health. These four factors are:

1. Structural Adequacy and Safety (most heavily weighted factor @ 55% max)
2. Serviceability and Functional Obsolescence (second most weighted factor @ 30% max)
3. Essentiality for Public Use
4. Special Reductions

Each one of these factors is given a numerical grade (using a sophisticated formula). The four weighted factors are added together to determine the sufficiency rating (SR). A rating of 100 represents a perfect bridge (entirely sufficient for its current use). A rating of 0 percent is the worst possible bridge (entirely insufficient for its current use).

These Bridges were programmed for replacement under the Federal Highway Bridge Program (HBP), as they were eligible for federal funds (FO with a SR of less than or near 50). Bridge eligibility can be determined by their SR, as follows:

- SR of less than 80 but greater than 50 are eligible for rehabilitation funding, under certain circumstances. If the rehabilitation costs are near the replacement costs, a bridge replacement can be allowed under the program.
- SR that is less than 50 are eligible for funding as a replacement.

Both Town bridges (Madrone and Nokomis) are eligible for replacement using HBP funding with SRs = 48.6 and 52.7 respectively. This SR rating is established through a biennial inspection of these bridges by a licensed engineer working for Caltrans. The Madrone and Nokomis bridges were evaluated under the above criteria and were ranked eligible for replacement using HBP federal funds. The Town was successful in applying and getting the federal funds authorized to replace these bridges under Federal, State, and Local design standards.

Elaborating on the four factors above:

1. Structural Adequacy and Safety – This factor looks at the structural components of the bridge. Example: If the bridge is experiencing scour of its supports, it could have its substructure rating downgraded making for a lower rating.
2. Serviceability and Functional Obsolescence – This factor looks at the functionality of the bridge. Example: If the capacity of the channel under the bridge is not able to adequately convey flood flows in the creek and the bridge is frequently flooded causing major traffic interruptions, it would be downgraded making for a lower factor.
3. Essentiality for Public Use – This factor looks at the importance of the bridge to the community at large. Example: If the bridge were to be taken out of service (closed due to flood damage), what would be the impacts to the community including detour length, access for emergency vehicles, etc.
4. Special Reductions - This is a factor which reduces the rating due to detour length, bridge railings, and structure type. Example: If the bridge has railings which do not meet current safety standards, it would get a lower rating.