Bridge Sufficiency Ratings

KANSAS
DEPARTMENT OF TRANSPORTATION

The sufficiency rating formula is a method of evaluating factors which indicate a bridge's sufficiency to remain in service. The result of the formula is a percentage in which 100 percent represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. The sufficiency rating is never less than 0 or more than 100.

States annually submit to the Federal Highway Administration (FHWA) all of the required information for each bridge. The FHWA uses these numbers to determine the sufficiency rating.

Many factors are included in the ratings (see Figure 1). The sufficiency rating doesn't necessarily indicate a bridge's ability to carry traffic loads. It helps determine which bridges may need repair or replacement, not which bridges could collapse.

A bridge's sufficiency rating affects its eligibility for federal funding for maintenance, rehabilitation, or replacement activities. For bridges to qualify for federal replacement funds, they must have a rating of 50 or below. To qualify for federal rehabilitation funding, a bridge must have a sufficiency rating of 80 or below.

Glossary of Sufficiency Rating Factors in Figure 1

Approach Roadway Alignment – This item identifies bridges which don't function properly or adequately due to the alignment of the approaches.

Approach Roadway Width – The normal width of usable roadway approaching the bridge, including shoulders that are structurally adequate for all weather and traffic conditions consistent with the nature of the roadway.

Average Daily Traffic – The average annual daily traffic volume crossing the bridge.

Bridge Roadway Width – The width of the bridge deck surface from curb to curb.

Culvert – Primarily a drainage structure, pipe or box section below and independent of the road surface. Its usual purpose is to let water pass under a road, railroad or embankment.

Deck – The part of a bridge which directly supports vehicles and pedestrians and transfers the loads to the superstructure.

Deck Condition – Surface and structural condition of the bridge deck.

Deck Geometry – A computed rating comparing: a) the number of lanes and the Average Daily Traffic and Bridge Roadway Width, and b) the functional classification and minimum vertical clearance over the bridge. The lowest rating for the two measurements is used.

Defense Highway – Is the bridge on the National Highway System?

Detour Length – The added distance motorists must travel on a state route detour if the bridge had to be closed.

Inventory Rating – A capacity rating that results in a load level that can safely use the bridge indefinitely. The Operating Rating results in the maximum permissible load level to which the bridge may be subjected.

Lanes on the Structure – The number of through lanes crossing a bridge. Full-width turning lanes and transition lanes are not included.

Structural Condition – The level of service the bridge provides and how it compares to a new bridge built to current engineering criteria for the type of road.

Structure Type – The primary materials and design type of the bridge superstructure.

Substructure – The parts of a bridge, including abutments and piers, which support the superstructure.

Superstructure – The parts of a bridge which carry the traffic load and pass that load to the substructure.

Underclearances – The height of the underside opening of a bridge that passes over a road or railroad.

Vertical Clearance over Deck – The height of the underside of structures that may cross over the bridge deck.

Waterway Adequacy – The ability of the channel under the bridge to carry water in a flood. This item also considers the potential for floodwaters to overtop the bridge and the potential inconvenience to travelers.

Figure 1

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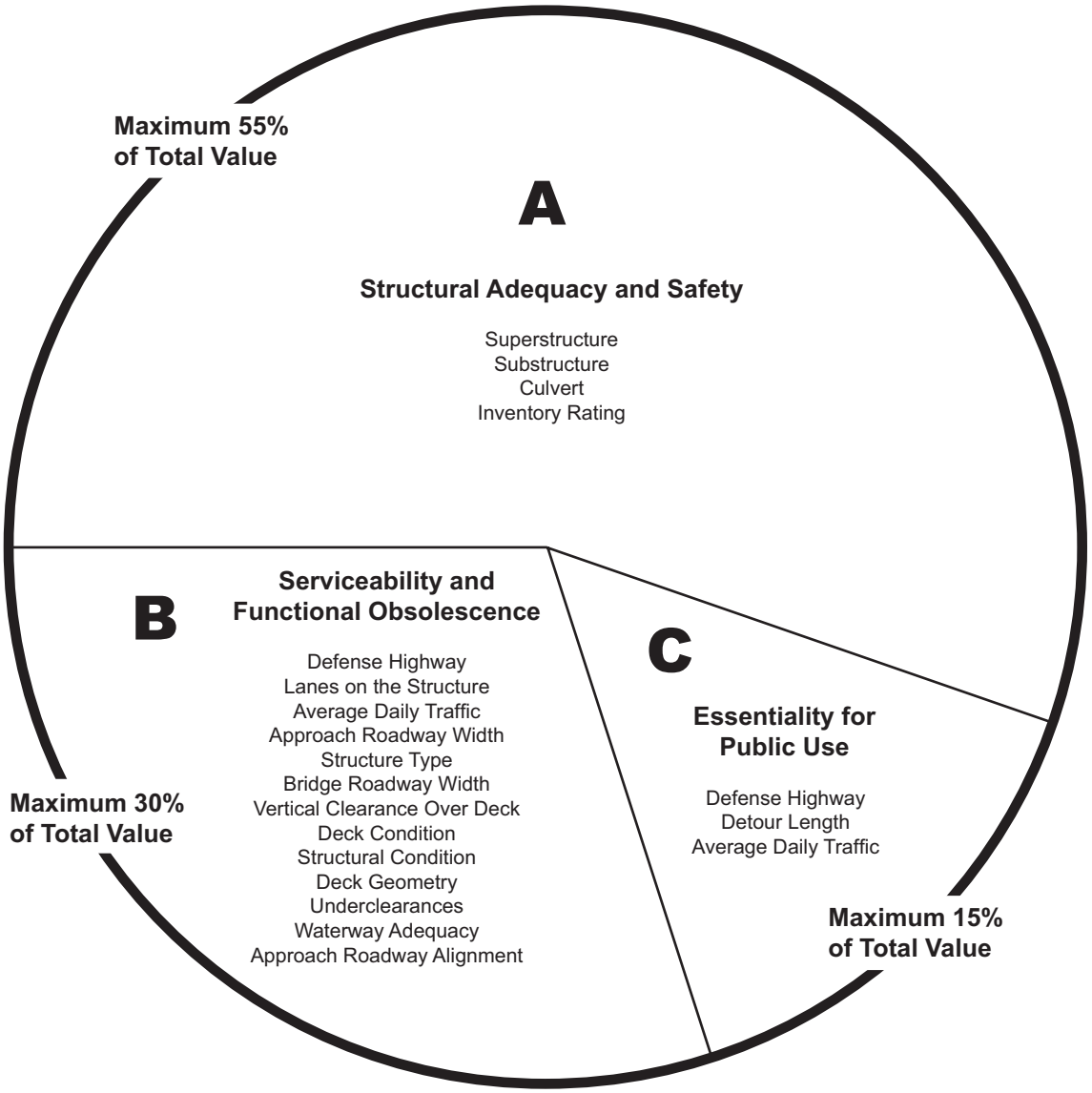
Summary of Sufficiency Rating Factors

Sufficiency Rating = A + B + C - D



D — **Special Reductions**

Detour Length
Traffic Safety Features
Main Structure Type

Maximum 13% of Total Value

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