

Appendix A National Bridge Inventory Background Information

According to Federal guidance, bridges may be found deficient by either structural or functional terms. A bridge is considered to be functionally obsolete if it has deck geometry, load carrying capacity, clearance or approach roadway alignment that no longer meets the criteria for the system of which the bridge is a part. Functionally obsolete bridges are also those lacking adequate lane and/or shoulder widths, or vertical clearance to serve the traffic demand or those that may be occasionally flooded.

A bridge is considered structurally obsolete if 1) significant load carrying elements are found to be in poor or worse condition due to deterioration and/or damage or, 2) the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient (to the point of causing intolerable traffic interruptions). Any bridge classified as structurally deficient is excluded from the functionally obsolete category.¹

According to federal regulations, all structures must be inspected at least once every two years and appropriate ratings assigned. FHWA, in consultation with the States, has assigned a sufficiency rating (SR) to each inventoried bridge (20 ft. in length or greater). Some states, including Georgia, use the sufficiency rating as the basis for establishing priority for repair or replacement of bridges; the lower the rating, the higher the priority. A sufficiency rating is a calculated numeric value used to indicate the sufficiency of a bridge to remain in service. Some states, including Georgia, use the sufficiency rating as the basis for establishing priority for repair or replacement of bridges; the lower the rating, the higher the priority.

Sufficiency ratings take into account a variety of factors including, but not limited to, condition of major structural components, volume of traffic, load rating, type of design clearance, and alignment of approach. The sufficiency rating assigns a numerical value ranging from 0 to 100 to a given bridge with the following percentage points applied to each parameter:

| | |
|---|-----------|
| 1. Structural adequacy | 55 |
| 2. Functional adequacy and serviceability | 35 |
| 3. Essential for public use | <u>15</u> |
| | 100 |

Structural adequacy is part of the sufficiency rating and is determined from a list of posted bridges, bridge inspection reports, and district recommendations. This is the most important factor in the evaluation process as a bridge structural failure could be catastrophic. The actual field conditions of a bridge are determined by reviewing the bridge inspection reports. The recommendations from the districts, which reflect first hand knowledge of the relative condition of the various bridges in their jurisdiction, are also used in determining structural adequacy.

Functional adequacy and serviceability is also part of the sufficiency rating and is determined from the bridge inspection reports, and district recommendations. The geometry of the bridge is evaluated in the bridge inspection report. Generally, the most important factor of the bridge's geometry is the clear roadway width. Narrow bridges, if

¹ FHWA Bridge Inspector's Reference Manual, Publication No. FHWA NHI 03-001, October, 2002, Revised December, 2006

they are structurally adequate, can be widened rather than replaced. Serviceability is related to factors like stream scour, maintenance of movable bridges, and deck deterioration. The frequency and severity of marine, railroad and automotive traffic accidents are also factors.

Determining whether a bridge is essential for public use is made using traffic counts, functional class of the highway, and available detour routes. If two bridges exist with the same degree of inadequacy, the one with the higher volume of traffic will receive the greatest priority. Additionally, if the bridge is part of a truck or school bus route or crosses a major river or stream, it will, similarly, receive special consideration. Additionally, non-redundant routes (those without available detours) are given a higher priority than redundant routes.

Federal Highway Bridge Replacement and Rehabilitation Program (HBRRP)

Eligibility for federal funding via the Federal Highway Bridge Replacement and Rehabilitation Program (HBRRP) is determined using the sufficiency rating (SR) based on the following criteria:

- SR \leq 80 eligible for rehabilitation
- SR < 50 eligible for replacement

Under the Federal Highway Bridge Replacement and Rehabilitation Program, a bridge must be at least 20 feet in length to qualify for replacement or rehabilitation funds. A sufficiency rating (SR) of less than 50 and classification as structural deficient or functionally obsolete is required to qualify a bridge for replacement, whereas, a sufficiency rating of less than 80 will qualify a bridge for rehabilitation.

It is important to note, that according to GDOT procedure *2405-1, Bridge Replacement, Title 23 CFR Section 650, Subpart D*, the current Federal Aid Policy Guide allows bridges on the current HBRRP selection list to be replaced if they have a sufficiency rating below 50. Bridges on the current HBRRP selection list, possessing a sufficiency rating greater than 50, may also be replaced if the widening and/or rehabilitation costs are more than the replacement costs. The current HBRRP selection list, which is updated annually, is kept by the Bridge Maintenance Section of the Office of Maintenance.