

Bridge condition assessment, measurement scale, and established condition level

The Authority utilizes the following condition rating scale, established by the Federal Highway Administration (“FHWA”) as part of the National Bridge Inspection Standards, to assess the condition of bridges within the Expressway System. The 10-point scale rates the bridge’s major structural bridge elements as follows:

Rating	Description
9	Excellent
8	Very good: no problems noted
7	Good: some minor problems
6	Satisfactory: structural elements show some minor deterioration
5	Fair: all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour
4	Poor: advanced section loss, deterioration, spalling, or scour
3	Serious: loss of section, deterioration, spalling, or scour have seriously affected primary structural components; local failures are possible; fatigue cracks in steel or shear cracks in concrete may be present
2	Critical: advanced deterioration of primary structural elements; fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support; unless closely monitored it may be necessary to close the bridge until corrective action is taken
1	Imminent failure: major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability; bridge is closed to traffic, but corrective action may put it back in light service
0	Failure: out of service; beyond corrective action

The Authority’s established condition level policy requires that no bridge be rated as “structurally deficient”, which results when a condition of 4 or worse is assessed to at least one of the major structural elements (deck, superstructure, or substructure). For the 36 bridges in the Authority’s inventory, the condition ratings of the major structural elements have been above a rating of 4 for each of the past five inspection cycles (calendar years).

In addition to the 10-point-scale for condition ratings as described above, FHWA may classify a bridge as structurally deficient if its load carrying capacity is significantly below current design standards. Boulevard Bridge, built in 1924, was designed using a lower live load capacity than current standards dictate. Considering its live load capacity, Boulevard Bridge is classified as structurally deficient by FHWA in spite of the fact that its condition ratings are greater than a 4. Boulevard Bridge is performing its intended function of connecting a residential neighborhood to areas north of the bridge and remains safe as currently operated by the Authority.

The following table presents the condition level ratings as determined by the Authority's independent certified inspection experts for the major structural elements of each of the Authority's bridges from the most recent inspection cycle (calendar years 2014/2015):

Bridge Identifier/Name	Deck	Superstructure	Substructure	Culvert
BB, Boulevard Bridge	7	5	5	8
BR04, Chippenham Parkway	7	6	6	NA
BR05, Norfolk Southern Railroad	7	5	7	8
BR06, Forest Hill Avenue	6	5	6	8
BR08NB, Powhite over James River	6	6	6	7
BR08SB, Powhite over James River	6	5	5	7
BR09N, CSX Railroad	NA	6	7	NA
BR09S, CSX Railroad	NA	5	6	NA
BR10N, CSX Railroad	NA	6	7	NA
BR10S, CSX Railroad	NA	6	7	NA
BR11, NB Powhite over Route 146	6	6	6	NA
BR12, Douglasdale	6	5	7	NA
BR13, Douglasdale	5	6	5	NA
BR17, Cary Street ramp	6	5	6	NA
BR36, Maplewood Avenue	7	6	6	NA
BR37, Grant Street	7	6	6	NA
BR46, Allen Avenue	6	7	6	NA
BR47, Randolph Street	6	7	6	NA
BR48, Harrison Street	6	7	6	NA
BR49, Cherry Street	6	7	7	NA
BR50, Laurel Street	6	6	6	NA
BR51, Belvidere Street	6	5	6	NA
BR54, 2nd Street	6	6	6	NA
BR55, 3rd Street	6	6	6	NA
BR56, 4th Street	6	7	7	NA
BR57, 5th Street	6	7	6	NA
BR58, 7th Street	6	6	5	NA
BR60, 10th Street	6	5	5	NA
BR61, 12th Street	6	7	5	NA
BR62, Canal Street exit ramp	7	6	6	NA
BR63, Double-decker at I-95 ramp	5	5	5	NA
BR64, I-95 south ramp	5	5	5	NA
BR65, I-95 north ramp	6	5	6	8
BR66, Double-decker at I-95 ramp	5	6	6	NA
BR67, I-95 north ramp	5	5	6	NA
BR68, I-95 south ramp	5	6	6	NA

NA – not applicable