South Carolina Department of Transportation

Engineering Directive

Directive Number: ED-70  
Effective: March 10, 2017

Subject: Load Restricted Bridge Replacement Project Prioritization Process

References: Section 57-1-370 of South Carolina Code of Laws, 1976, as amended; S.C. Code of Regulations 63-10, as amended

Primary Department: Maintenance

In 2007, the South Carolina General Assembly enacted Act 114. One of the landmark items in Act 114 was the requirement that the South Carolina Department of Transportation (SCDOT) establish a project prioritization process. In 2016, the General Assembly enacted Act 275. Act 275 eliminated some of Act 114’s requirements but it retained the requirement for project prioritization. This requirement is codified in Section 57-1-370 of the South Carolina Code of Laws, 1976, as amended. Additional detail on the process is found in S.C. Code of Regulations 63-10, as amended.

This engineering directive details the process for ranking load restricted bridges for replacement using objective and quantifiable criteria.

The number of load restricted bridges varies from month to month, with the number usually ranging from 300 to 350 bridges. Load restricted bridges will be ranked on a statewide priority basis.

The following relevant criteria along with the bridge management system (BrM) will be used when calculating the scores to rank bridge replacement candidates on a scale of 0 to 1,500 points. The higher the point value, the higher the priority for replacement. An initial candidate list will be generated from BrM using a scale of 0 to 1,000 points. The bridge with the highest cost benefit ratio will receive 1,000 points, with the remaining bridges receiving a percentage of points based on their cost benefit ratio compared to the bridge with the highest cost benefit ratio.

BrM uses the following criteria to rank bridges for replacement based on the cost benefit ratio calculated for each structure by the software. The output from BrM is the criterion that primarily supports the purpose and need of this program category. For that reason, this criterion received the highest weighting of 1,000 points among the relevant criteria.

- **Structural Condition** - Structural condition is the bridge’s condition as compared to a new condition and is determined by detailed inspection data.

- **Traffic Status** - Traffic status is a reflection of the actual operational status of the structure (closed, load-restricted, or recommended for load restriction).

- **Average Daily Traffic (ADT)** - ADT is the average traffic volume per day.
- **Average Daily Truck Traffic (ADTT)** - ADTT is the percentage of ADT that is truck traffic, converted to truck volume.

- **Detour Length** - Detour length is the additional distance one would have to travel if the bridge must be closed or load restricted.

Once the pool of prospective bridge candidates has been ranked by BrM, bridges will be sorted by engineering district and sent to the district engineering administrators for the completion of the field review criteria, which will be worth 0 to 500 points. The districts will score each bridge using the criteria listed below and return the results to the State Bridge Maintenance Engineer. The points from the field review will be added to the points received from the BrM prioritization, and bridges will be ranked from highest total score to the lowest total score.

- **Route Continuity and River Basin Upgrades (0 to 125 points)** - This criterion ensures that needed route upgrades are justified and provide both short and long-term benefit. It also provides a mechanism to ensure that our river basins receive additional consideration since these bridges are generally larger, carry more traffic, and also have significant detours if major work or restrictions are required. The 125 point maximum for this criterion reflects this importance.

- **District Repair Feasibility (0 to 75 points)** - This item is used to evaluate bridge repair history, needs, and effectiveness.

- **Improved Emergency Services and Emergency Evacuation Routes (0 to 75 points)** - This criterion ensures that emergency services such as fire and ambulance are considered and that interruptions are minimal. It also ensures that hurricane evacuation routes are maintained to a high level, as well as primary and secondary lifeline routes for seismic response.

- **State Freight Network (0 to 50 points)** - This criterion is used to give some added emphasis to roads on the freight network. Recent federal funding legislation emphasizes improving the condition of the freight network. If the road segment is on the designated freight network, then it receives full value for this criterion. If not, it receives no value.

- **Strategic Corridor Network (0 to 50 points)** - This criterion is used as a supplemental criterion to give some added emphasis to roads on the strategic corridor network. Recent federal funding legislation emphasizes improving the condition of the strategic corridor network. If the road segment is on the strategic corridor network, then it receives full value for this criterion. If not, it receives no value.

- **New Schools and/or Changes in Bus Routes (0 to 50 points)** - These developments should be analyzed in terms of how much impact new schools have when constructed. Since school bus routes are relative to the population and location of school-aged students and can change from year to year, close coordination with school districts is necessary.

- **Known Commercial Routes (0 to 50 points)** - This criterion ensures that SCDOT considers the movement of goods and the impacts that structurally deficient bridges may have on known commercial routes.
Future Economic Development (Residential/Commercial) (0 to 25 points) - This criterion is used to measure current and future needs and benefits provided to existing or future developments.

The following Act 114 criteria were considered but deemed not relevant as they relate to the bridge replacement program category priority list, as they do not support the purpose and need of this program category.

- **Financial Viability** - Not relevant as part of the prioritization process since rehabilitation and replacement are normal steps in the life cycle of a bridge. Replacement cost is considered when determining the type of replacement structure, but not in the ranking process.

- **Pavement Quality Index (PQI)** - Not relevant as part of the prioritization process since PQI is not calculated for, nor applicable to bridge decks.

- **Environmental Impact** - Not relevant as part of the prioritization process. The environmental permitting process is a part of every bridge replacement project and may have a large impact on the time it takes to develop the project, but it is not used to prioritize bridge replacements.

- **Alternative Transportation Solutions** - Not relevant to Bridge Replacement Program category.

- **Consistency with Local Land Use Plans** - Not relevant to the prioritization process since this program category consists of the rehabilitation and replacement of existing bridge structures.

Upon completion of the selection and vetting process, the prioritized list of bridge replacement candidates will be presented to the SCDOT Commission for approval.

All data used for project prioritization will be kept on file as required by Departmental Directive 51 and SCDOT’s record retention schedules.

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