

Advanced Technologies for Enhancing Safety and Deferring Bridge Replacements

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While fracture critical bridges represent a real risk for owners across America, advanced technologies are commercially available that can enhance user safety and provide owners with a more objective and precise understanding of current bridge condition. Given objective and timely information about bridge condition, bridge management becomes much more effective, supporting more focused inspections, enforcing reduced weight limits, and the safe deferral of unnecessary bridge repairs or replacement actions.

Since the I-35W collapse in 2007, bridge owners and the Federal Highway Administration (FHWA) have been explaining the meaning of “structurally deficient” to the user community. We’ve been told not to worry about collapse, since the structurally deficient condition state is not indicative of an impending problem. While that is certainly true overall, individual bridges, especially those that are structurally deficient AND fracture critical like I-35W, suggest otherwise.

The current method of inspecting bridges uses a 40-plus-year-old visual inspection process. The FHWA studied this protocol over 10 years ago and reported the process is subjective and does not produce consistently reliable results. So, bridge owners are relying on a subjective, variable, and inconsistent method of inspection to ensure user safety, develop repair or replacement projects, and qualify for federal financing through the Highway Bridge Program. If sole reliance on this manual process seems outdated and questionable to you, especially for fracture critical bridges, we applaud your critical thinking ability.

We advocate the judicious and technically appropriate use of certain advanced technologies, known as structural monitoring, for ALL fracture critical bridges AND others with superstructure ratings below 6. There is sufficient evidence that use of these technologies can provide owners with a robust return on investment while enhancing user safety. If bridge owners do not have sufficient financial resources to replace a sick bridge, at the very least they should rely on structural monitoring technology to provide the objective and precise condition information necessary to assure safety and support the safe deferral of repair or replacement actions. We also urge the FHWA to strongly support the use of these advanced technologies both verbally and financially, especially for those 8,000 or so fracture critical bridges that may or may not support the next heavy vehicle that passes.