

# Bridge Inspection: A Monumental and Worthwhile Task

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Bridges are often viewed as the attractive, exciting part of civil engineering—and, according to this bridge engineer, they are! However, maintaining their high-standing reputation is no easy task.

While the most exciting aspect of bridge engineering is considered to be the design and construction of new bridges, we should recognize there is more to bridge engineering than that. Not every bridge rises to the level of the Golden Gate or Brooklyn Bridge. Most bridges are ordinary, unassuming, and rarely noticed after they are open to traffic. Many users do not consider the details of the designs, much less the beautiful settings these structures often pass through. Not all of the excitement and glory of bridge engineering comes through design. It takes a lot of hard work and planning to maintain these bridges, and good maintenance starts with the eyes of inspectors in the field, looking at bridges while they are in service.

The bridge engineering community designs relatively few bridges every year. Most bridges in the United States, numbering in the hundreds of thousands, are in service already. And when just one of these thousands of bridges has a problem, we immediately focus on the flaw and visualize a twisted bridge deck and gaping hole where the bridge once stood. We do not think about the intricate engineering details some midlevel engineer put into the design 60 years ago when the bridge was built. We take notice of the problem because experience has taught us that when bridges fail, disaster is close at hand.

Bridge inspection is a big deal! The safety and security of the traveling public are very dependent on how well bridges are maintained. Can you imagine how difficult your journey down the road would be if there were no bridges, or how much more traffic congestion there would be if even a few key bridges were simply taken off the map? Our cars cannot ford a river like wagons did in the pioneer days, most water crossings do not have ferries, and most of us do not rely on horses for our daily commute. We need bridges just to make it to the grocery store, and we do not even realize they are there.

Bridge inspection was born out of rapid growth and necessity. With the construction of our interstate system starting in the 1950s, the quantity and complexity of U.S. bridges expanded rapidly. Given the volume of work to create these new bridges, maintenance budgets rarely managed to keep pace with the new infrastructure. The 1967 collapse of the Silver Bridge over the Ohio River between Ohio

and West Virginia brought about the launch of our nationwide bridge inspection program. The collapse of the Mianus River Bridge on Interstate 95 in Connecticut in 1983 took the bridge inspection program to the next level, bringing about some of the components we have in our modern-day bridge inspection program. Both of these failures took the lives of many people and were the result of maintenance issues that a well-trained bridge inspector would have found if a detailed inspection program had been in place. In response to these failures, Congress directed the Federal Highway Administration to create the bridge inspection program and set the guidelines we use today.

Bridge inspection is not just about preventing collapses to save lives. It is a part of a larger program designed to assess the condition of our bridges and identify problems while they are minor and easy to repair. The data collected in bridge inspections are used to establish

Traffic control is in place to provide safe snooper access for inspectors during an interstate bridge inspection. All Photos: Vaughn & Melton.





Bridge inspectors are trained to work safely in dangerous environments and to communicate technical data in challenging situations.

the condition of each and every part of a bridge so that owners, usually state departments of transportation or other local agencies, can direct their funding to address key small problems before they become big problems. The data are also used to help determine exactly how much load aging bridges can support so that heavy vehicles do not cause damage to those structures. Bridge inspection not only saves lives but also collects the data needed to ensure that our tax dollars are spent carefully and thoughtfully to maximize bridge service life at the lowest reasonable cost. Bridge inspection is about safety, maintenance, setting the right priorities, and ensuring proper loading of our bridges.

While not every bridge inspector is required to be a professional engineer, inspectors need to have intimate knowledge of how bridges work. The best bridge inspectors tend to have a

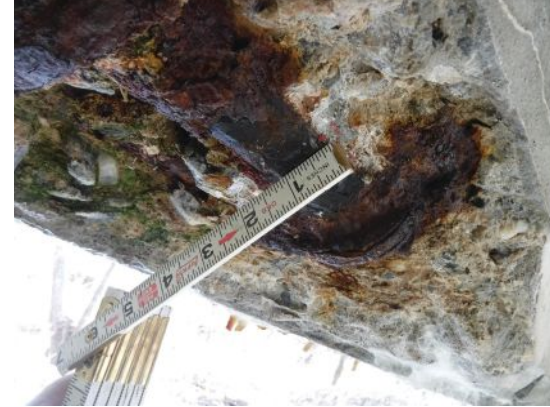
Drones can be used to augment inspection, providing perspectives not available from access equipment or in difficult-to-reach locations.



Cracks and spalls being measured and documented during a bridge inspection.

background in bridge design, and most are licensed professional engineers. Bridge inspectors are required to pass a two-week training class and then get recertified every two to five years, depending on the state they work in. Often working in two-person teams, they are trained to work safely in dangerous environments, both natural and artificial, and they are prepared to communicate technical data in challenging situations. Bridge inspection is not work that is taken lightly, and states demand a high level of competence.

Recently, a bridge inspector noticed a major crack in the Interstate 40 steel bridge crossing the Mississippi River, and the bridge was immediately closed. It was later found that previous inspections had been incomplete or not properly carried out. When situations like this occur, it is easy to dismiss the credibility of the craft; however, this case is a



Example of data being gathered on corrosion damage to a concrete element during a bridge inspection.

very rare exception. Like a good bridge design, bridge inspection is not intended to be noticed. Hundreds or thousands of bridges are inspected accurately and completely every day across the country. But when concerns about inspection quality manifest themselves, they too inspire fear—and we forget to recall that good bridge inspection has served the public extremely well for decades. When bridge inspection is performed to its intended level of detail, it is truly a monumental and worthwhile task.

The next time you drive down the road, take notice of the handful of bridges you cross and recognize that maintaining them well is just as important as designing them well. Remember that good maintenance begins with bridge inspections being done by well-trained teams of technicians, engineers, and owners with your best interest in mind. 