

U.S. Bridges: Paying the Toll for Repairs and Replacements

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U.S. motorists from one end of the country to the other have been complaining about crumbling roads with teeth-chattering large pot holes and unsafe, deteriorating bridges for many years. The most-severe infrastructure problems were largely ignored by government officials on the federal, state and local level for decades, but that attitude proved to be tragic.

The period of public apathy about infrastructure repair ended disastrously during the evening rush hour on Aug. 1, 2007. On that day, the eight-lane, 40-year-old Interstate 35W Mississippi River bridge that once ferried about 140,000 vehicles per day in Minneapolis suddenly collapsed into the river and riverbanks below. Thirteen people were killed as a result of the catastrophe and another 145 were injured as about 111 vehicles fell into the river (17 vehicles were recovered). Federal and academic inspection reports dating back 17 years before the collapse cited problems with the bridge's structure. In fact, the federal government rated the I-35W "structurally deficient" due to significant corrosion in its bearings in 2005, according to a Federal Highway Administration (FHA) report.¹ About 75,000 of the roughly 600,000 U.S. bridges were given the rating that year.² The structurally deficient designation means some components of the bridges' decks or support structures were rated poor or worse. While not necessarily unsafe, the structurally deficient designation often requires speed and weight restrictions to reduce the risk of collapse. In 2008 (the latest year for which the FHA has data), the number of structurally deficient bridges was still 72,888, or 12.1% of the nation's bridges, while 89,024, almost 15% of U.S. bridges, were categorized as functionally obsolete.³

A replacement for the I-35W bridge was constructed quickly and opened on Sept. 18, 2008. After investigating the failure, the National Safety Transportation Safety Board (NTSB) blamed the collapse on a design flaw, but also mentioned that additional weight at rush hour contributed to the bridge's breaking apart in its final report. Major safety issues identified by NTSB in its investigation included:

- Insufficient bridge design firm quality control procedures for designing bridges, and insufficient federal and state procedures for reviewing and approving bridge design plans and calculations.
- Lack of guidance for bridge owners with regard to the placement of construction loads on bridges during repair or maintenance activities; exclusion of gusset plates [a metal plate used to strengthen a joist] in bridge load rating guidance.
- Lack of inspection guidance for conditions of gusset plate distortion; and inadequate use of technologies for accurately assessing the condition of gusset plates on deck truss bridges [the I-35W bridge was of this type].⁴

The tragedy focused attention on the nation's aging infrastructure and led to many investigations of the state of U.S. infrastructure such as the one conducted by The American Society of Civil Engineers (ASCE), "The Report Card for America's Infrastructure." In its latest report, the ASCE gives the nation's bridges a grade of "C."⁵ The organization cited the FHA data and stated that bridges are usually built to last 50 years, but the average U.S. bridge is now 43 years old. To repair and replace bridges, states tap federal, state and local funds. In 2004, \$10.5 billion was spent on bridge improvements by all levels of government, according to the American Association of State Highway and Transportation Officials (AASHTO). About half of the budget was funded by the Federal Highway Bridge Program, \$3.9 billion came from state and local budgets and an additional \$1.5 billion in other federal highway aid.⁶ AASHTO estimated in 2008 that it would cost roughly \$140 billion* to repair every deficient or structurally obsolete bridge in the United States.⁷

However, keeping the current overall level of bridge conditions, i.e., not allowing the backlog of deficient bridges to increase, would require a combined investment from public and private sectors of \$650 billion over 50 years, according to AASHTO, for an average annual investment level of \$13 billion. But AASHTO estimates that the cost of fixing all existing bridge deficiencies to be \$850 billion in 2006 dollars, or an average bill of \$17 billion per year.

The ASCE noted in its 2009 report card noted some progress in repairing the nation's rural bridges. From 2005 to 2008, the number of deficient (structurally deficient plus functionally obsolete) rural bridges declined by 8,596. However, bridges in urban areas did not fare as well as the number of deficient bridges increased 2,817. The increase in urban deficient bridges is especially worrisome because truck traffic over the nation's bridges (especially the urban ones) has been growing—a matter of great concern as trucks normally carry significantly heavier loads than automobiles and usually cause more wear and tear on bridges.

The ASCE also stated in its 2009 report card that the "investment gap is accelerating and the failure to invest adequately in the nation's bridges will lead to increased congestion and delays for motorists, wasted fuel, the further deterioration of bridge conditions, and increased safety concerns."⁸ The ASCE also recommends that Congress, which is now in the process of authorizing the 2009 Surface Transportation Program to provide funding for U.S. infrastructure, should establish a goal that less than 15% of the nation's bridges be classified as structurally deficient or functionally obsolete by 2013 and should provide the proper funds to achieve this target.

There was quite a bit of media attention devoted to infrastructure repairs that were promised in the \$875 billion stimulus plan, formally known as the American Recovery and Reinvestment Act, enacted this past February. The plan devoted \$22.7 billion for road and bridge building. The stimulus called for using the funds for projects that were "shovel ready," or could be started within 120 days of the law's passage, or June 29. Because of the stimulus plan's emphasis on projects could be started quickly, tens of thousands of unsafe or decaying U.S. bridges carrying 100 million drivers a day are still waiting for repairs because states have been using the stimulus money on spans that are already in good shape or on easier projects like repaving roads, according to an analysis of state spending of stimulus dollars by the Associated Press.⁹

The bottom line is that while the stimulus plan will bring needed repairs to many U.S. bridges, it will take a significant concerted effort from both the private and public sectors to repair the \$279 billion worth of estimated damage to all deficient or structurally obsolete bridges in the United States today.

Sources:

¹ Federal Highway Administration report: Deficient Bridges by State and Highway System 2005, 2008: <http://www.fhwa.dot.gov/bridge/deficient.cfm>

² Ibid.

³ Ibid

⁴ Highway Accident Report: Collapse of I-35W Highway Bridge Minneapolis, Minnesota August 1, 2007: <http://www.nts.gov/publictn/2008/HAR0803.pdf>

⁵ American Society of Civil Engineers 2009 Report Card for America's Infrastructure: <http://www.infrastructurereportcard.org/fact-sheet/bridges>

⁶ American Association of State Highway and Transportation Officials (AASHTO). Bridging the Gap. July 2008

⁷ Ibid

⁸ American Society of Civil Engineers 2009 Report Card for America's Infrastructure: <http://www.infrastructurereportcard.org/fact-sheet/bridges>

⁹ "AP Impact: States pass up bad bridges for repairs, steer stimulus cash to speedier projects," by Brett J. Backledge and Matt Apuzzo, July 31, 2009

*NOTE: This amount was corrected from "\$279 billion," which was erroneously stated in the original posting of this white paper. The correct amount, as estimated by the AASHTO, is "\$140 billion." See Footnote 6 and 7.

Disclosure Statements:

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