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2009 ASCE REPORT CARD for America's Infrastructure

The American Society of Civil Engineers' (ASCE) 2009 Report Card for America's Infrastructure gave the nation's infrastructure an overall grade of "D" and estimated an investment need of \$2.2 trillion dollars over 5 years to improve the condition from poor to good. Little to no progress has been made in the 4 years since the society released its previous report card in 2005, and the results were disappointing for the 15 categories graded in 2009—four Cs and 11 Ds. Of those grades, only one category—Energy—went up, and three categories—Aviation, Roads, and Transit—actually went down. And, the \$2.2 trillion need for investment

"C," though showing no improvement since the 2005 report. Almost 27%, or more than one in four, of the nation's bridges are considered structurally deficient or functionally obsolete. In real numbers, this means that of the 600,905 bridges listed by the U.S. Department of Transportation in December 2008, 72,868 (12.1%) were categorized as structurally deficient and 89,024 (14.8%) were categorized as functionally obsolete. Even though the number of deficient rural bridges declined by 8596 from 2005 to 2008, the number of deficient urban bridges increased by 2817 during the same time period. Considering the higher level of passenger and freight traffic on these urban bridges, the impact is significant.

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represents an increase of more than half a trillion dollars since the 2005 report estimated need of \$1.6 trillion. The \$2.2 trillion, which was adjusted for a 3% rate of inflation, represents capital spending at all levels of government and includes anticipated investments. Current spending amounts to only about half of this number, which leaves \$1.1 trillion in needed investment for the United States over the next 5 years. As this increased investment need shows, inaction has only raised the price tag for infrastructure improvement.

America's bridges fared only slightly better than the majority of the report card categories, receiving a grade of

According to the American Association of State Highway and Transportation Officials (AASHTO), a total of \$10.5 billion was spent on construction and maintenance of bridges from all levels of government in 2004. That breaks down to \$5.1 billion funded from the Federal Highway Bridge Program, \$3.9 billion from state and local budgets, and an additional \$1.5 billion in other federal highway aid. In 2008, AASHTO estimated that it would cost nearly \$140 billion to repair all deficient bridges in the country—\$48 billion to repair structurally deficient bridges and \$91 billion to improve functionally obsolete bridges. AASHTO also estimated that to maintain current bridge conditions, or to simply keep the backlog of deficient bridges from growing any larger,

would require a combined investment from public and private sectors of \$650 billion over 50 years, an average annual investment of \$13 billion. The cost of eliminating all existing bridge deficiencies over the next 50 years was estimated to be \$850 billion (in 2006 dollars), an average annual investment of \$17 billion.

How did the condition of the nation's bridges get to this unacceptable level? Simply put, these bridges are aging. The average age of a bridge in the United States is 43 years with a design life in many cases of only 50 years. And, while maintenance of a bridge, like the maintenance of a car, can increase useful and efficient life, postponing that maintenance generally leads to much more costly repairs in the short run and untimely replacement in the long run. Combine the age of the nation's bridges with a chronic level of under funding and the picture of how this occurred becomes very clear.

ASCE proposes five nationally focused key solutions.

What can be done to improve the state of the nation's bridges and other critical public works? In an effort to raise the grades on its infrastructure report card, ASCE proposes five nationally-focused key solutions. While these recommendations are broad in their scope, each can easily be applied directly to bridges:

- **Increase federal leadership in infrastructure**

Bridges are a crucial part of the nation's transportation system. A new federal goal should be set to reduce the number of bridges classified as structurally deficient or functionally obsolete to less than 15% of the national inventory by 2013.

- **Promote sustainability and resilience**

Bridges must be able to withstand both current and future challenges and be designed to protect the natural environment and withstand both natural and man-made hazards. Research and development should be funded at the

federal level to develop more efficient methods and materials for building and maintaining the nation's bridges.

- **Develop federal, regional, and state infrastructure plans**

Transportation investment at all levels must be prioritized and executed according to well-conceived plans that both complement the national vision and focus on system-wide outputs. Bridges, as a major component of transportation investment, must be prioritized and factored into overall infrastructure plans.

- **Address life-cycle costs and ongoing maintenance**

Life-cycle analysis must be performed for new and existing bridges to account not only for initial construction, but also for the operation, maintenance, environmental, safety, and other costs reasonably anticipated during the life of the bridge, including recovery from natural or man-made hazards. This includes updated bridge inspection standards to determine conditions and an asset-management approach to maintaining bridges to achieve an appropriate balance between correcting immediate problems, conducting preventive maintenance, rehabilitating deficient bridges, and periodically replacing older bridges.

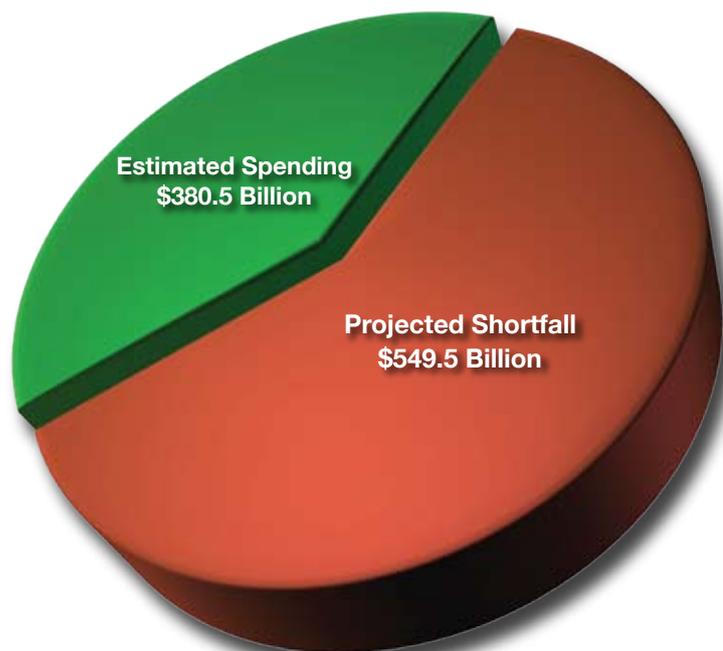
- **Increase and improve infrastructure investment from all stakeholders**

All levels of government, owners, and users must significantly increase transportation investments to fund needed repair, renovation, and reconstruction of the nation's bridges. All viable financing programs must be explored and federal investment must be used to complement, encourage, and leverage investment from state and local governments as well as from the private sector.

Needed Action

America's bridges are aging, and all too often are not being maintained at the necessary level of service. Adding to this, the investment gap for bridge needs is accelerating and the failure to adequately invest is leading to increased congestion and delays for motorists, wasted fuel, the further deterioration of bridge conditions, and increased safety concerns. Not only must Congress work to address these problems in the 2009 authorization of the Surface Transportation Program, but it must also set a goal to reduce the number of the nation's bridges classified as structurally deficient and functionally obsolete. Time is working against our country's infrastructure and capital is a scarce resource. However, if we do not invest now, we will end up paying more in the long run.

Estimated 5-Year Funding Requirements for Bridges and Roads
Total Investment Needs: \$930 Billion



2010 CONCRETE BRIDGE AWARDS COMPETITION

CALL FOR ENTRIES Deadline September 4, 2009

ELIGIBILITY The Portland Cement Association invites entries for its Twelfth Biennial Bridge Awards Competition. Eligible structures for the 2010 competition must have been essentially completed between April 2008 and September 2009, and must be located within the United States or Canada.

BRIDGE CRITERIA All types of bridges—highway, rail, transit, and pedestrian—in which the basic structural system is concrete, are eligible. Entries are equally encouraged for cast-in-place or precast concrete bridges with short, medium, or long spans. Newly constructed, reconstructed, or widened structures qualify for the competition.

WHO MAY ENTER Any organization, public or private, may enter. Multiple entries are welcome.

AWARDS Commemorative plaques will be presented at the Concrete Bridge Conference to be held in Phoenix, Arizona, February 24-26, 2010.

ENTRY For an entry form and to view previous award winners visit: www.cement.org/bridges.

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Photo courtesy of EIG, photographer Tim Davis.

How to do it in Precast...

Q How do you connect the rebar?

A Use the... **NMB Splice-Sleeve System.**

Q How is the moment connection made?

A All you need is an emulative detail, reconnect the concrete and rebar.

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