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# Highway Bridge Conditions: Issues for Congress

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# Summary

Of the 608,000 public road bridges in the United States, about 64,000 (10%) were classified as structurally deficient in 2013, and another 84,000 (14%) were classified as functionally obsolete. The number of structurally deficient and functionally obsolete bridges has been declining steadily for more than two decades, and those that remain are not necessarily unsafe. Nonetheless, several high-profile bridge failures, including the 2013 collapse of a bridge on Interstate 5 in Washington State, have drawn public attention to the condition of bridges on federal-aid highways.

As it debates reauthorization of the Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), the 2012 law which reauthorized federal surface transportation programs, Congress may consider mandating increased spending on bridge improvements. The choice Congress makes will largely determine how quickly deficient and obsolete bridges will be replaced or improved. At the spending level of 2010, which included a significant amount of money provided by the American Recovery and Reinvestment Act of 2009 (P.L. 111-5), the Federal Highway Administration (FHWA) estimates that the bridge investment backlog (in dollar terms) would be reduced by 93% by 2030. Reducing the backlog to near zero during the same period is estimated to require an annual spending rate about 2% higher than the 2010 level.

MAP-21 eliminated the former Highway Bridge Program, which distributed federal money specifically for bridge improvements. States may use funds received under two major FHWA programs, the National Highway Performance Program and the Surface Transportation Program, for bridge repairs or construction, but the decision about how much of its funding to devote to bridges rather than roadway needs is up to each state. FHWA enforces certain planning requirements and performance standards established in MAP-21, but it does not make the determination as to which bridges should benefit from federal funding.

Congressional issues regarding the nation's highway bridge infrastructure include

- Given the steady decline in the number of structurally deficient bridges during recent decades, should Congress accelerate work on the remaining deficient bridges?
- Should Congress encourage the states to spend more of their federal funds on their deficient bridges, potentially reducing the flexibility states were granted under MAP-21?
- Given large projected shortfalls in highway trust fund revenues relative to authorized spending, should Congress encourage increased use of tolling and public-private partnerships (P3s) to improve bridges?
- Should Congress redirect spending away from off-system bridges to more heavily used bridges on the designated federal-aid highways?
- Congressional oversight of bridge conditions could be complicated by the absence of a freestanding program. How quickly can FHWA develop the MAP-21 performance measures to report to Congress on progress on bridge conditions?

A brief CRS video on this subject may be viewed at http://www.crs.gov/video/detail.aspx?PRODCODE=WVB00009&Source=search.

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# Background

The United States has approximately 608,000 bridges on public roads subject to the National Bridge Inspection Standards mandated by Congress.[1] About 48% of these bridges are owned by state governments and 50% by local governments. State governments generally own the larger and more heavily traveled bridges, such as those on the Interstate Highway system. Only 1.5% of highway bridges are owned by the federal government, primarily those on federally owned land.

About 9% of all bridges carry Interstate Highways, and another 25% serve arterial highways other than Interstates.[2] Interstate and other major arterial bridges carry almost 80% of average daily traffic. The highest traffic loads are on Interstate Highway bridges in urban areas; these account for only 5% of all bridges, but carried 37% of average daily traffic in 2013.[3]

## Bridge Conditions

Federal law requires states to periodically inspect public road bridges and to report these findings to the Federal Highway Administration (FHWA). This information permits FHWA to characterize the existing condition of a bridge compared with one newly built and to identify those that are structurally deficient or functionally obsolete. A bridge is considered structurally deficient "if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or if the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing intolerable traffic interruptions."[4]

A functionally obsolete bridge, on the other hand, is one whose geometric characteristics—deck geometry (such as the number and width of lanes), roadway approach alignment, and over/underclearances—do not meet current design standards or traffic demands. A bridge can be both structurally deficient and functionally obsolete, but structural deficiencies take precedence in classification. As a result, a bridge that is both structurally deficient and functionally obsolete is classified in the FHWA's National Bridge Inventory as structurally deficient.

A bridge classified as structurally deficient or functionally obsolete is not necessarily unsafe, but may require the posting of a vehicle weight or height restriction.

The proportion of bridges classified as structurally deficient has declined 57% since 1990, and fell almost every year between 1990 and 2013 (see **Figure 1**). In 2013, approximately 64,000 bridges, or 10% of the total number of bridges, were classified as structurally deficient, as compared to 138,000 in 1990. The number of functionally obsolete bridges fell from 100,000 to

[1] The standards, authorized at 23 U.S.C. §144, cover bridges located on public roads that are 20 feet (6.1 meters) in length or longer. Federal Highway Administration, "Bridges by Owner, December 2013," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

[2] Arterials, including Interstates, are roads designed to provide for relatively long trips at high speed and usually have multiple lanes and limited access. Federal Highway Administration, "Count of Bridges by Functional Classification, 2013," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

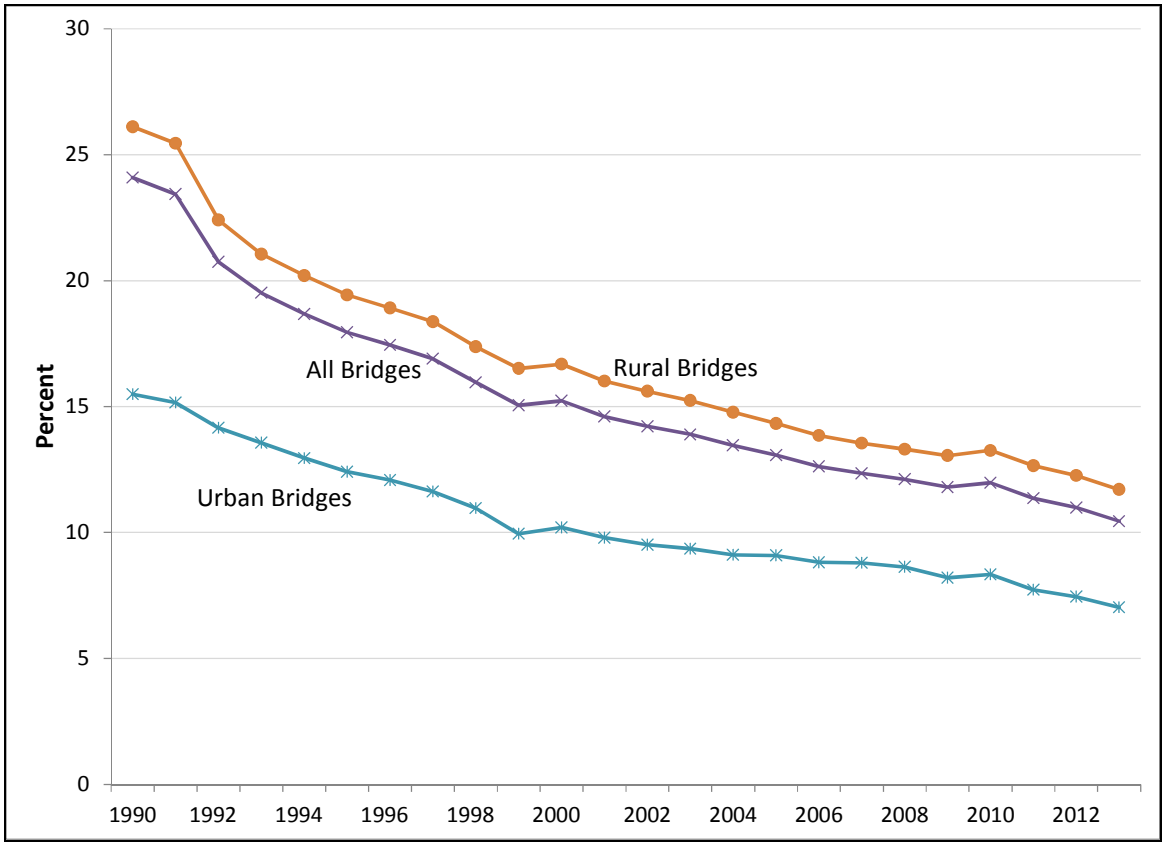
[3] Federal Highway Administration, "ADT on Bridges by Functional Classification, 2013," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

[4] Federal Highway Administration, and Federal Transit Administration, *2013 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, Exhibit 3-11, http://www.fhwa.dot.gov/policy/2013cpr/pdfs.htm.

84,000 over the same period, a drop of 16%. The share of bridges classified as functionally obsolete in 2013 was 14%. In total, then, almost a quarter of U.S. bridges were deficient in that year.

**Figure 1. Structurally Deficient Bridges in the United States, 1990-2013**

Percent of All Bridges in Category




**Source:** 1990-2012: Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-28; 2013: Federal Highway Administration, National Bridge Inventory, "Count, Area, Length, and ADT of Bridges by Functional Classification"

Bridges on the most heavily traveled roads, such as Interstates and other arterials, are generally in better condition than bridges on more lightly traveled routes. For example, 4.4% of urban Interstate Highway bridges were considered structurally deficient in 2013, about half of the 9.4% structural deficiency rate of urban bridges on local roads. Likewise, 3.8% of rural Interstate Highway bridges were structurally deficient in 2013, about a quarter of the 16.5% structural deficiency rate of bridges on rural roads handling local traffic.

As the bridges on local roads are usually owned by local governments, locally owned bridges had more than twice the structural deficiency rate of state-owned bridges in 2013. Some 14.1% of locally owned bridges were categorized as structurally deficient in 2013, versus 6.7% of state-owned bridges. For bridge deficiency and obsolescence rates by state see **Appendix A**.

## Future Bridge Funding Needs

Every two years, FHWA assesses the condition and performance of the nation's highways and bridges, documents current spending by all levels of government, and estimates future spending needs to maintain or improve current conditions and performance.[5] As with any attempt to forecast future conditions, a host of simplifying assumptions, omissions, and data problems influences these estimates. Among other things, they rely on forecasts of travel demand and assume that the most economically productive projects (i.e., projects with the highest benefits relative to costs) will be implemented first. Despite such uncertainties and assumptions, these estimates provide a way to assess the level of current spending compared with what would be needed in the future under different scenarios.

The 2013 needs assessment, the most recent available, shows that in 2010 $100.2 billion was spent on capital improvements to the nation's highways and bridges.[6] Of that amount, $82.2 billion was spent on roadways and $18.0 billion was spent on bridges. The vast majority of the expenditure on bridges, $17.1 billion, went to rehabilitate or replace existing bridges, with the remainder devoted to construction of new bridges.[7] The $17.1 billion spent in 2010 was an increase of 35% over the $12.7 billion spent in 2008.[8] The funding increase was largely due to the American Recovery and Reinvestment Act of 2009 (P.L. 111-5; ARRA).

Because of the modeling involved, FHWA's future needs estimates for bridges are limited to fixing deficiencies in existing bridges only when the benefits outweigh the costs. The future needs estimate can therefore be measured against the $17.1 billion expenditure in 2010. The U.S. Department of Transportation (DOT) estimates that fixing all existing bridge deficiencies would cost $106.4 billion (in 2010 dollars).[9]

Of course, fixing all deficient bridges overnight is not feasible. FHWA, therefore, estimates how this investment backlog will change at various levels of spending over the 2011-2030 period, taking into account the deterioration of existing bridges over that period. The results of this analysis, seen in **Figure 2**, are strongly influenced by the ARRA funding. ARRA appropriated general funds for highways to add to the funding from the highway trust fund that had already been authorized. According to FHWA, to keep the backlog at the 2010 level through 2030 would require $8.9 billion annually (in 2010 dollars), less than the level of spending in 2010. To eliminate the backlog by 2030 would require an investment of $20.2 billion annually, implying roughly a 1.6% annual increase in inflation-adjusted spending. Spending between $8.9 billion and $20.2 billion per year, FHWA estimated, would improve the conditions of the nation's bridges but would not entirely eliminate the investment backlog. At the level of spending in 2010, $17.1

[5] The "improve" scenario is the level of spending in which the investment is made in all projects for which the economic benefits are equal to or greater than the economic costs.

[6] These spending figures do not include routine maintenance costs.

[7] Spending for new bridges is defined by FHWA as "expenditures for construction of a new bridge that will not replace or relocate an existing bridge. A new bridge will provide: (1) a bridge where none existed, or (2) an additional and alternate bridge to an existing bridge or ferry that will remain open and continue to serve through traffic." See http://www.fhwa.dot.gov/policyinformation/hss/guide/ch12.cfm

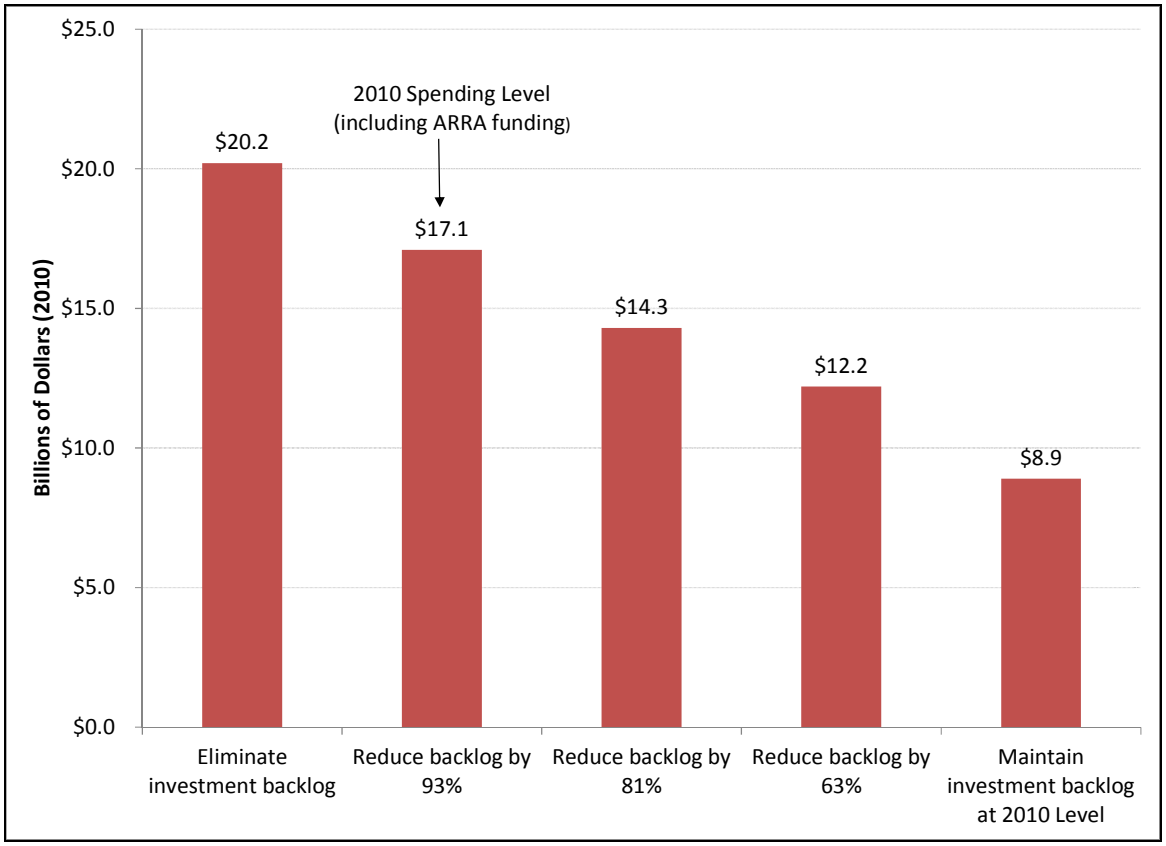
[8] Federal Highway Administration, and Federal Transit Administration, *2013 Conditions and Performance*, exhibits 6-12 and 6-14.

[9] Ibid., exhibit 7-16.

billion per year, the total dollar cost of correcting all remaining deficiencies would decline by 93% by 2030.

**Figure 2. Effect of Bridge Spending on Bridge Investment Backlog**

Average Annual Spending 2011 Through 2030 (Billion 2010 Dollars)




**Source:** Federal Highway Administration and Federal Transit Administration, *2013 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, exhibit 7-16.

# Federal and State Roles

Federal assistance for the maintenance, rehabilitation, and construction of highway bridges comes principally through the federal-aid highway program administered by FHWA. FHWA, however, does not make the determination as to which bridges should benefit from federal funding. Almost all funding under the federal-aid highway program is distributed to state departments of transportation, which determine, for the most part, where and on what the money is spent. States must comply with detailed federal planning guidelines as part of the decision-making process, but otherwise are free to spend their federal highway funds in any way consistent with federal laws and regulations. Bridge projects are developed at the state level, and state departments of transportation let the contracts, oversee the construction process, and provide for the inspection of bridges.[10]

[10] See CRS Report R42793, *Federal-Aid Highway Program (FAHP): In Brief*, by (name redacted).

The 2012 surface transportation reauthorization, the Moving Ahead for Progress in the 21st Century Act (MAP-21, P.L. 112-141), further strengthened the states' ability to determine spending on bridges by eliminating the Highway Bridge Program (HBP), which provided money to the states specifically for bridge construction and rehabilitation. Bridge improvements remain eligible for funding under two programs created by MAP-21 that distribute funds to the states under formulas specified in the law, the National Highway Performance Program (NHPP) and the Surface Transportation Program (STP). Under both programs, the states determine how much of their federal funding goes for bridges as opposed to other uses, primarily highway construction and improvement. These funds may also be used for the seismic retrofitting of bridges to reduce earthquake failure risk.[11]

FHWA is involved in the project decision-making process in two significant ways. First, MAP-21 (§1111) requires FHWA, in consultation with the states and federal agencies, to classify public road bridges according to "serviceability, safety, and essentiality for public use ... [and] based on that classification, assign each a risk-based priority for systematic preventative maintenance, replacement or rehabilitation." However, none of the MAP-21 programs appear to require the new classification and risk-based priority metric be used to determine program eligibility.[12] In addition to developing this metric, FHWA imposes certain performance measures that states must meet to avoid funding penalties pursuant to MAP-21. For example, if more than 10% of the deck area of a state's bridges on the National Highway System is structurally deficient, the state is subject to a penalty requiring it to dedicate an amount of its NHPP funds equal to 50% FY2009 HBP spending to bridge projects.[13]

While the HBP existed, bridge program apportionments—the money states were entitled to receive each year under the HBP—were trending upward. Spending (obligations) on bridge projects, however, tended to be substantially lower than the apportioned amounts. The transfer by the states of HBP funding to other highway programs, while permitted by law, was controversial following the collapse of the I-35W Bridge in Minnesota in 2007. At the time, critics saw the widening gap between annual apportionments and spending as evidence of state transfer of resources to nonbridge uses. However, bridge spending was an eligible expense under all the core formula programs, not just HBP, and total federal grants obligated for bridge work exceeded HBP apportionments every year between FY2007 and FY2012 ( **Table 1**).

[11] See CRS Report R41746, *Earthquake Risk and U.S. Highway Infrastructure: Frequently Asked Questions*, by (name redacted), (name redacted), and (name redacted).

[12] Leftover funding from the Highway Bridge Program will continue to use the "sufficiency rating" for prioritizing project eligibility. For more information see http://www.fhwa.dot.gov/bridge/bridgeload01.cfm. See also definitions of structurally deficient and functionally obsolete at http://www.fhwa.dot.gov/bridge/0650dsup.cfm.

[13] For a definition of the National Highway System see http://www.fhwa.dot.gov/planning/national_highway_system/.

**Table 1. Federal Obligations for Bridges Improvements, FY2007-2012**

Dollars in Millions

| | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 | FY2012 | FY2013 |
|---|---|---|---|---|---|---|---|
| **HBP Apportionments** | $5,041 | $5,058 | $5,177 | $5,612 | $5,897 | $5,509 | NA |
| **HBP Obligations** | $3,761 | $4,066 | $4,212 | $4,284 | $4,193 | $3,575 | $0,960 |
| **Total Federal-Aid Highway Programs' Bridge Obligations** | $6,418 | $6,837 | $9,386 | $8,472 | $7,043 | $6,014 | $6,484 |

**Source:** FHWA. FY2009-FY2011 total obligations reflect obligation of stimulus funds under the American Recovery and Reinvestment Act of 2009 (P.L. 111-5).

**Note:** For a detailed table of bridge obligations for these years, see **Appendix B**. FY2013 total reflects ongoing obligations of funds under prior authorizations as well as MAP-21 authorizations.

Under MAP-21, which eliminated the HBP, the states have even more freedom to decide how much of their federal surface transportation grants to spend on bridges. During FY2013, states obligated roughly 8% more federal-aid highway funds for bridge work than in FY2012. However, the FY2013 level was substantially lower than during FY2008 through FY2011. Those higher levels reflect the availability of stimulus funds during FY2009 through FY2011. Typically, federal-aid highway funds are available for obligation for four years, so through FY2016 the states may continue to obligate funds authorized prior to MAP-21.

## Bridge Inspection

Under the National Bridge Inspection Program (NBIP), all bridges longer than 20 feet on public roads must be inspected by state inspectors or certified inspection contractors, based on federally defined requirements. Federal agencies are subject to the same requirements for federally owned bridges, such as those on federal lands. Data from these inspections are reported to FHWA, which uses them to compile a list of deficient or functionally obsolete bridges. States may use this information to identify which bridges need replacement or repair.[14]

FHWA sets the standards for bridge inspection through the National Bridge Inspection Standards (NBIS).[15] The NBIS set forth how, with what frequency, and by whom bridge inspection is to be completed. The standards provide the following:

- Each state is responsible for the inspection of all public highway bridges within the state except for those owned by the federal government or Indian tribes. Although the state may delegate some bridge inspection responsibilities to smaller units of government, the responsibility for having the inspections done in conformance with federal requirements remains with the state.
- Inspections can be done by state employees or by certified inspectors employed by consultants under contract to a state department of transportation.

[14] The National Bridge Inspection Program was initiated in 1968 following the 1967 collapse of the so-called Silver Bridge over the Ohio River. The National Bridge Inspection Standards were first issued in 1971. See, Federal Highway Administration, *Tables of Frequently Requested NBI Information*, http://www.fhwa.dot.gov/bridge/britab.cfm.

[15] 23 C.F.R. §650 subpart C.

- Inspection of a federally owned bridge is the responsibility of the federal agency that owns the bridge.
- The NBIS set forth the standards for the qualification and training of bridge inspection personnel.
- In general, the required frequency of inspection is every 24 months. States are to identify bridges that require less than a 24-month frequency. States can also, however, request FHWA approval to inspect certain bridges on an up to 48-month frequency. Frequency of underwater inspection is generally 60 months but may be increased to 72 months with FHWA permission.
- The most common on-site inspection is a visual inspection by trained inspectors, one of whom must meet the additional training requirements of a team leader. Damage and special inspections do not require the presence of a team leader.
- Load rating of a bridge must be under the responsibility of a registered professional engineer. Structures that cannot carry maximum legal loads for the roadway must be posted.

The vast majority of inspections are done by state employees or consultants working for the states. FHWA inspectors do, at times, conduct audit inspections to assure that states are complying with the bridge inspection requirements. FHWA also provides on-site engineering expertise in the examination of the reasons for a catastrophic bridge failure. However, FHWA bridge engineers have only limited time available for audits and other bridge oversight.

## FHWA's Emergency Relief Program

The Emergency Relief Program (ER) provides funding for bridges damaged in natural disasters or that are subject to catastrophic failures from an outside source. The program provides funds for emergency repairs immediately after the failure to restore essential traffic, as well as for longer-term permanent repairs.

ER is authorized at $100 million per year, nationwide. Funding beyond this is commonly provided for in supplemental appropriations acts. In the case of most large disasters, additional ER funds are provided in an appropriations bill, usually a supplemental appropriations bill.

The federal share of emergency repairs to restore essential travel during the first 180 days following a disaster is 100%. Later repairs, as well as permanent repairs such as reconstruction or replacement of a collapsed bridge, are reimbursed at the same federal share that would normally apply to the federal-aid highway facility. Recently, Congress has sometimes legislatively raised the federal share under the ER program to 100% (as happened with the I-35W collapse in Minnesota). As is true with other FHWA programs, the ER program is administered through state departments of transportation in close coordination with FHWA's division office in each state. ER was the source of funds for replacement of the I-5 Skagit River Bridge in Washington State, which collapsed on May 23, 2013, after being struck by a truck that was hauling an oversized load.

# Issues for Congress

The Skagit River Bridge collapse led to warnings that the large number of structurally deficient bridges indicates an incipient crisis,[16] even though the bridge itself was not structurally deficient.[17] FHWA data do not substantiate this assertion. The numbers of bridges classified as structurally deficient or functionally obsolete have fallen consistently since 1990, and the proportion of all highway bridges falling into one or the other category is the lowest in decades.

The condition of roads has not experienced the same degree of improvement as the condition of bridges. This raises the policy question of what priority should go to bridge repairs as opposed to roadway repairs. In MAP-21, Congress implicitly addressed this issue by giving states greater flexibility to use federal funding for roads or for bridges, at their discretion. By doing this, Congress chose not to mandate bridge spending levels sufficient to reduce the number of deficient bridges by a certain date or eliminate deficient bridges altogether (described in **Figure 2**). Instead, responsibility for determining the amount that should be spent on bridges each year was assigned to the states.

A related issue is one of terminology. The terms "structurally deficient" and "functionally obsolete" are not synonymous with "unsafe." An effort to eliminate all structurally deficient bridges quickly could lead to inefficient spending if a significant percentage of these bridges do not actually have major safety problems. Under MAP-21, FHWA is to develop performance measures in regard to bridges. The speed of their development and the effectiveness of implementation will be oversight issues for Congress.[18]

## Federal Pressure for State Bridge Spending

To encourage state spending on structurally deficient bridges, MAP-21 sets a penalty threshold under the NHPP: any state whose structurally deficient bridge deck area on the National Highway System within the state's borders exceeds 10% of its total National Highway System bridge deck area for three years in a row must devote NHPP funds equal to 50% of the state's FY2009 Highway Bridge program apportionment to improve bridge conditions during the following fiscal year and each year thereafter until the deck area of structurally deficient bridges falls to 10% or below. Even if a state were required to spend more of its federal highway funding on bridges (and

[16] See, for example, the Associated Press article "Many U.S. bridges at risk of failure like Interstate 5 collapse," *Plain Dealer*, May 26, 2013, http://www.cleveland.com/nation/index.ssf/2013/05/many_us_bridges_at_risk_of_fai.html; "Washington bridge collapse serves as a wake-up call," *USA Today*, May 28, 2013, "Bridge collapse shines light on aging infrastructure," *USA Today*, May 24, 2013, http://www.usatoday.com/story/news/nation/2013/05/24/washington-bridge-collapse-nations-bridges-deficient/2358419/; Bryce Covert, "Washington Bridge Collapse Another Sign That America's Infrastructure Is In Bad Shape," *Think Progress*, http://thinkprogress.org/economy/2013/05/24/2058241/seattle-bridge-collapse-infrastructure/?mobile=nc; Angela Greiling Keane and James Nash, "I-5 Bridge Collapse Shows Bridge Repair Needs Across U.S.," Bloomberg, May 25, 2013, http://www.bloomberg.com/news/2013-05-24/bridge-collapse-accents-structural-decay-as-budgets-sag.html.

[17] See Federal Highway Administration, *National Bridge Inventory: Structure Inventory and Appraisal; WA Structure: 00004794A000000*.

[18] Office of the Inspector General, U.S. Dept. of Transportation, *FHWA Has Not Fully Implemented All MAP-21 Bridge Provisions and Prior OIG* Recommendations, Audit report MH-2014-089, August 25, 2014, https://www.oig.dot.gov/library-item/32045. As of the release of the audit report, FHWA had completed 12 of 24 actions identified to implement MAP-21 safety and funding provisions.

therefore less on roadway projects) due to this penalty, its mandated spending on deficient bridges would be less than was required prior to the enactment of MAP-21.

Given the lags in state reporting and the time required to complete major bridge projects, it is not clear whether the states' desire to spend their STP or NHPP funds on nonbridge projects is obstructing the declared national policy of reducing the number of deficient bridges.

## Providing More Money for Bridges

Federal motor fuel tax revenues, which have provided most of the funding for the federal-aid highway program since 1956, have been insufficient to support the program as authorized by Congress for several years. MAP-21 allocated money from the Treasury's general fund for highway and bridge programs in FY2013 and FY2014. The Highway and Transportation Funding Act of 2014 (P.L. 113-159) also used transfers to extend MAP-21's funding levels and policies for eight months, through May 31, 2015. If Congress wishes to increase spending on bridges in a long-term reauthorization bill, it has a number of options:

- Provide general fund monies to accelerate the repair of structurally deficient and functionally obsolete bridges.
- Consider resurrecting a stand-alone program for structurally deficient bridges, which would essentially reverse the change made in MAP-21 and would force the states to provide minimum spending levels for bridge maintenance and repair.
- Raise the fuel taxes that finance the vast majority of surface transportation outlays, possibly with a portion of the increase dedicated to a federal bridge program.
- Emphasize public-private partnerships (P3s) as a mechanism to help reduce the number of structurally deficient bridges, for example, by allowing states to offer long-term leases of toll facilities to private investors in return for large up-front payments that could be used to supplement normal state and federal spending on bridge replacement and repair.

## Encourage Tolling of Nontolled Bridges

Heavily traveled bridges can be attractive targets for conversion to toll facilities: many bridges have no convenient alternatives, so many drivers may be unable to avoid paying whatever toll is imposed. An expansion of tolling could allow for more rapid improvement of major bridges. The revenue stream provided by tolls can also make bridge building and reconstruction an attractive investment for private entities that are interested in participating in a P3 and can help projects become eligible for a federal Transportation Infrastructure Finance and Innovation Act (TIFIA) loan. Bridge tolls, however, are often very unpopular, and their acceptance varies greatly from region to region. Some states have sought to make bridge tolls more acceptable within a state by charging out-of-state users at a much higher rate than in-state residents, a practice that may face legal challenges.

## Redirect Spending Away from Off-System Bridges

Historically, nearly all federal highway funding was restricted to roads and bridges on the federal-aid highway system. The Surface Transportation Assistance Act of 1978 (P.L. 95-599) stipulated that not less than 15% of a state's bridge apportionments nor more than 35% be spent "off-system." Off-system spending of federal bridge funds has been required in every highway authorization bill ever since. Under MAP-21, STP funds equal to at least 15% of the amounts apportioned to a state for the Highway Bridge Program in FY2009 are to be obligated for off-system bridge projects.

Off-system bridges, by definition, are inherently local in nature. By eliminating the set-aside for off-system bridges, Congress could enable states to spend more of their federal funds on bridges that are more heavily used, but states would not be required to spend funds for that purpose without additional legislation.

## Maintenance

The FHWA requirement that federal funding be directed to bridges with relatively low sufficiency ratings may encourage states to substitute bridge replacement for maintenance-type projects. During FY2012, of the total obligation of federal funds from all FHWA sources, 11% was obligated for new bridges, 55% was obligated for bridge replacement, 4% was for major rehabilitation, and 30% was for minor bridge work. Although these figures indicate that the lion's share of bridge funding has been obligated for new and replacement bridges, these percentages are less than they were in the late 1990s. The percentage spent on minor bridge work has increased significantly since then.[19] Still, the case can be made that as the number of deficient bridges decreases it might make sense to shift spending toward preventive maintenance.

## Oversight and Inspection Issues[20]

### Risk-Based Approach to Federal Bridge Oversight

MAP-21 requires that the National Bridge Inventory classify bridges according to serviceability, safety, and essentiality for public use and, based on this classification; assign each bridge a risk-based priority for systematic preventative maintenance, replacement, or rehabilitation. The risk-based approach would provide an additional metric to the traditional focus on bridges that are "structurally deficient" and "functionally obsolete." In particular, the risk-based approach, which is still under development by FHWA, could provide statistics that more clearly identify unsafe bridges. An August 21, 2014, report by the Department of Transportation Office of Inspector General Audit Report found that FHWA had not fully implemented all MAP-21 bridge provisions, including the provision that DOT establish a risk-based bridge prioritization process.[21] Once the

[19] Federal Highway Administration, "Obligation of Federal Funds for Bridge Projects Underway by Improvement Type," *Highway Statistics*, Washington, FHWA, various years, and *Highway Statistics 2012, Table FA-10*.

[20] See also Federal Highway Administration, *Tables of Frequently Requested NBI Information*, http://www.fhwa.dot.gov/bridge/britab.cfm.

[21] Department of Transportation. Office of Inspector General, *FHWA Has Not Fully Implemented All MAP-21 Bridge Provisions and Prior OIG Recommendations*, Audit Report MH-2014-089, Washington, DC, August 21, 2014, pp. 1-29, https://www.oig.dot.gov/library-item/32045.

metric is developed, Congress could consider making its use an eligibility requirement for bridge project funding under NHPP and STP.

## Oversight of State Transportation Implementation Plans (STIPs)

MAP-21 maintains the previous requirement that states' spending of federal funds on bridges be based on priorities established in state transportation implementation plans (STIPs). Following the elimination of the Highway Bridge Program in 2012, Congress may want to examine state spending on bridges under MAP-21 and, in particular, whether STIPs pay adequate attention to bridge needs as opposed to highway needs.

## Inspection Auditing

FHWA could be directed to take a more active role in ensuring that inspections done by the states or their contractors are done in conformance with the National Bridge Inspection Standards, including on-site audits of state inspections. However, to have an impact, FHWA would have to be provided with sufficient funding to hire additional engineers and support personnel at FHWA Division offices and dedicate these resources to oversight of the inspection program.

## Inspector Training and Personnel Qualifications

MAP-21 included requirements for establishment of minimum inspection standards and an annual review of state compliance with the standards established in the act. Within two years of enactment the Secretary of Transportation is to update the standards for the methodology, training, and qualifications of inspectors. Congress may wish to oversee implementation of these provisions.

# Appendix A. Bridge Condition by State

Data as of December 2013

| State | All Bridges (number) | Structurally Deficient (number) | Functionally Obsolete (number) | Percent of Bridges in State | |
|---|---|---|---|---|---|
| | | | | Structurally Deficient | Functionally Obsolete |
| Alabama | 16,078 | 1,405 | 2,203 | 9% | 14% |
| Alaska | 1,196 | 133 | 157 | 11% | 13% |
| Arizona | 7,862 | 238 | 716 | 3% | 9% |
| Arkansas | 12,748 | 880 | 2,014 | 7% | 16% |
| California | 24,955 | 2,769 | 4,184 | 11% | 17% |
| Colorado | 8,612 | 536 | 902 | 6% | 10% |
| Connecticut | 4,218 | 413 | 1,059 | 10% | 25% |
| Delaware | 864 | 56 | 121 | 6% | 14% |
| District of Columbia | 252 | 21 | 159 | 8% | 63% |
| Florida | 12,070 | 259 | 1,785 | 2% | 15% |
| Georgia | 14,769 | 835 | 1,765 | 6% | 12% |
| Hawaii | 1,125 | 144 | 350 | 13% | 31% |
| Idaho | 4,232 | 406 | 453 | 10% | 11% |
| Illinois | 26,621 | 2,275 | 1,971 | 9% | 7% |
| Indiana | 18,953 | 1,944 | 2,224 | 10% | 12% |
| Iowa | 24,398 | 5,043 | 1,228 | 21% | 5% |
| Kansas | 25,171 | 2,554 | 1,911 | 10% | 8% |
| Kentucky | 14,116 | 1,234 | 3,202 | 9% | 23% |
| Louisiana | 13,050 | 1,827 | 1,963 | 14% | 15% |
| Maine | 2,402 | 366 | 425 | 15% | 18% |
| Maryland | 5,291 | 333 | 1,085 | 6% | 21% |
| Massachusetts | 5,136 | 487 | 2,207 | 9% | 43% |
| Michigan | 11,022 | 1,298 | 1,720 | 12% | 16% |
| Minnesota | 13,137 | 1,086 | 427 | 8% | 3% |
| Mississippi | 17,044 | 2,274 | 1,362 | 13% | 8% |
| Missouri | 24,350 | 3,357 | 3,276 | 14% | 13% |
| Montana | 5,126 | 376 | 506 | 7% | 10% |
| Nebraska | 15,370 | 2,739 | 1,026 | 18% | 7% |
| Nevada | 1,853 | 36 | 217 | 2% | 12% |
| New Hampshire | 2,438 | 355 | 435 | 15% | 18% |
| New Jersey | 6,566 | 624 | 1,710 | 10% | 26% |
| New Mexico | 3,935 | 298 | 356 | 8% | 9% |
| New York | 17,442 | 2,078 | 4,697 | 12% | 27% |

| State | All Bridges (number) | Structurally Deficient (number) | Functionally Obsolete (number) | Percent of Bridges in State | |
|---|---|---|---|---|---|
| | | | | Structurally Deficient | Functionally Obsolete |
| North Carolina | 18,168 | 2,308 | 3,226 | 13% | 18% |
| North Dakota | 4,439 | 726 | 240 | 16% | 5% |
| Ohio | 27,015 | 2,242 | 4,405 | 8% | 16% |
| Oklahoma | 22,912 | 4,227 | 1,601 | 18% | 7% |
| Oregon | 7,656 | 431 | 1,323 | 6% | 17% |
| Pennsylvania | 22,660 | 5,218 | 4,343 | 23% | 19% |
| Rhode Island | 766 | 167 | 266 | 22% | 35% |
| South Carolina | 9,275 | 1,048 | 872 | 11% | 9% |
| South Dakota | 5,875 | 1,210 | 249 | 21% | 4% |
| Tennessee | 20,058 | 1,157 | 2,645 | 6% | 13% |
| Texas | 52,561 | 1,283 | 8,715 | 2% | 17% |
| Utah | 2,974 | 117 | 320 | 4% | 11% |
| Vermont | 2,731 | 251 | 652 | 9% | 24% |
| Virginia | 13,765 | 1,186 | 2,402 | 9% | 17% |
| Washington | 7,902 | 372 | 1,694 | 5% | 21% |
| West Virginia | 7,125 | 944 | 1,570 | 13% | 22% |
| Wisconsin | 14,088 | 1,198 | 772 | 9% | 5% |
| Wyoming | 3,099 | 443 | 280 | 14% | 9% |
| Puerto Rico | 2,280 | 315 | 957 | 14% | 42% |
| **Total (incl. Puerto Rico)** | **607,751** | **63,522** | **84,348** | **10%** | **14%** |

**Source:** Federal Highway Administration, *National Bridge Inventory, Deficient Bridges by State and Highway System.*

# Appendix B. Bridge Obligations by FHWA Program: FY2007-FY2013

| Program | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 | FY2012 | FY2013 | Total, FY2007-13 |
|---|---|---|---|---|---|---|---|---|
| Interstate Maintenance | 566,367,740 | 531,148,044 | 456,257,769 | 659,096,900 | 583,304,527 | 755,656,556 | 129,051,722 | 3,680,883,257 |
| National Highway System | 629,914,133 | 870,072,229 | 597,997,506 | 863,300,679 | 836,649,803 | 680,253,396 | 88,777,186 | 4,566,964,933 |
| Surface Transportation Program | 476,908,635 | 547,815,377 | 708,246,051 | 603,721,498 | 586,685,394 | 558,073,243 | 1,662,455,267 | 5,143,905,465 |
| National Highway Performance Program | — | — | — | — | — | — | 3,018,008,912 | 3,018,008,912 |
| Transportation Alternatives | — | — | — | — | — | — | 138,881 | 138,881 |
| Bridge Programs | 3,761,052,215 | 4,066,121,536 | 4,211,724,679 | 4,283,730,495 | 4,193,314,245 | 3,575,482,507 | 960,648,620 | 25,052,074,297 |
| Congestion Mitigation And Air Quality | 23,905,076 | 52,369,318 | 8,579,895 | 47,636,428 | 91,470,609 | (10,213,853) | 72,343,225 | 286,090,700 |
| Appalachian Development Highway System | 19,971,806 | 449,969 | 61,133,266 | 30,653,664 | 28,236,759 | 5,436,959 | 24,767,784 | 170,650,208 |
| High Priority Projects | 141,223,886 | 188,500,355 | 226,877,040 | 150,934,801 | 224,452,978 | 61,045,589 | — | 933,034,650 |
| Minimum Guarantee—TEA-21 | 70,261,361 | (6,841,861) | (5,295,640) | (14,994,995) | (16,498,678) | 12,053,469 | 9,919,033 | 48,602,689 |
| Equity Bonus Exempt Lim | 55,196,232 | 23,363,153 | 96,050,658 | 35,326,437 | 14,007,551 | 59,268,059 | 451,407,959 | 734,620,049 |
| Coordinated Border Infrastructure Program | 41,711 | 11,580,237 | 23,208,473 | 23,039,215 | 30,457,277 | 10,461,126 | 3,049,907 | 101,837,946 |
| Planning And Research | — | — | — | — | — | (200,000) | — | (200,000) |
| All Others | 673,252,684 | 552,598,820 | 3,000,825,716 | 1,789,136,040 | 470,519,916 | 306,635,541 | 63,018,956 | 6,855,987,673 |
| **Total** | 6,418,095,480 | 6,837,177,177 | 9,385,605,414 | 8,471,581,163 | 7,042,600,382 | 6,013,952,592 | 6,483,587,452 | 50,652,599,660 |

**Source:** Federal Highway Administration. This table displays obligations of MAP-21 funds as well as ongoing obligation of funds from earlier authorization acts.

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