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Highway Bridge Conditions: Issues for Congress

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Summary

Of the 612,000 public road bridges in the United States, about 59,000 (10%) were classified as structurally deficient in 2015, and another 84,000 (14%) were classified as functionally obsolete. These figures—along with events such as the July 20, 2015, washout of the Interstate-10 Bridge near Desert Center, CA, and the partial closure of the Arlington Memorial Bridge, which connects Washington, DC, to Northern Virginia—have led to claims that the United States is experiencing a crisis with respect to deficient bridges. Federal data do not substantiate this assertion. The numbers of bridges classified as structurally deficient or functionally obsolete have fallen consistently since at least 2000, and the proportion of all highway bridges falling into one or the other category is the lowest in decades.

The vast majority of structurally deficient bridges, roughly four out of five, are in rural areas. These bridges tend to be small and relatively lightly traveled. Structurally deficient bridges in urban areas, while far fewer, are generally much larger and, therefore, more expensive to fix: 55% of the deck area of structurally deficient bridges is on urban bridges. Bridges on roads carrying heavy traffic loads, particularly Interstate Highway bridges, are generally in better condition than those on more lightly traveled routes.

Federal funding for bridge building, reconstruction, and repair is authorized in surface transportation acts. The most recent authorization is the Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94), which was enacted on December 4, 2015. The FAST Act funds federal highway programs from FY2016 through FY2020 at a level about 2.4% above FY2015 levels, adjusted for expected inflation. The law did not authorize a program dedicated to highway bridges, but it made bridge projects broadly eligible for federal funding under the largest of the highway formula programs and eligible on a case-by-case basis under other programs. Bridges that are damaged by natural disasters or catastrophic events also may be eligible for Emergency Relief Program funds.

The condition of roads, in particular urban roads, has not experienced the same degree of improvement as the condition of bridges. This disparity raises the policy question of what priority should go to bridge repairs as opposed to roadway repairs. Congress has implicitly addressed this issue by giving states greater flexibility to use federal funding for roads or for bridges, at their discretion. Laws enacted in 2012 and again in 2015 have given states near-total authority to determine which projects to fund with federal highway funds, within broad guidelines established by Congress. As it oversees implementation of the FAST Act over the next few years, Congress may want to evaluate whether states are making sufficient progress in reducing the number of structurally deficient and functionally obsolete bridges and whether future laws should reestablish specific requirements for bridge spending.

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Background

The United States has approximately 612,000 bridges on public roads subject to the National Bridge Inspection Standards (NBIS) mandated by Congress. About 47% of these bridges are owned by state governments, and 50% are owned by local governments. State governments generally own the larger and more heavily traveled bridges, such as those on the Interstate Highway system. Less than 2% of highway bridges are owned by the federal government, primarily those on federally owned land.[1]

About 9% of all bridges carry Interstate Highways, and another 14% serve principal arterial highways other than Interstates.[2] Interstate and other principal arterial bridges carry almost 80% of average daily bridge traffic. The highest traffic loads are on Interstate Highway bridges in urban areas; these account for only 5% of all bridges but carried 36% of average daily traffic in 2015.[3]

Bridge Conditions

Federal law requires states to inspect public road bridges periodically and to report their 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 bridges 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 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 FHWA's National Bridge Inventory as structurally deficient. In 2015, almost a quarter of U.S. bridges were classified as structurally deficient, functionally obsolete, or both.

[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 (FHWA), "Bridges by Owner, 2015," 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. *Principal arterials* exclude rural and urban minor arterials. FHWA, "Count of Bridges by Functional Classification, 2015," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

[3] FHWA, "ADT on Bridges by Functional Classification, 2015," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

[4] FHWA 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/cp2013.pdf.

A bridge classified as structurally deficient or functionally obsolete is not necessarily unsafe but may require the posting of a vehicle weight restriction. When officials determine that a bridge is unsafe, they normally close it to traffic immediately.

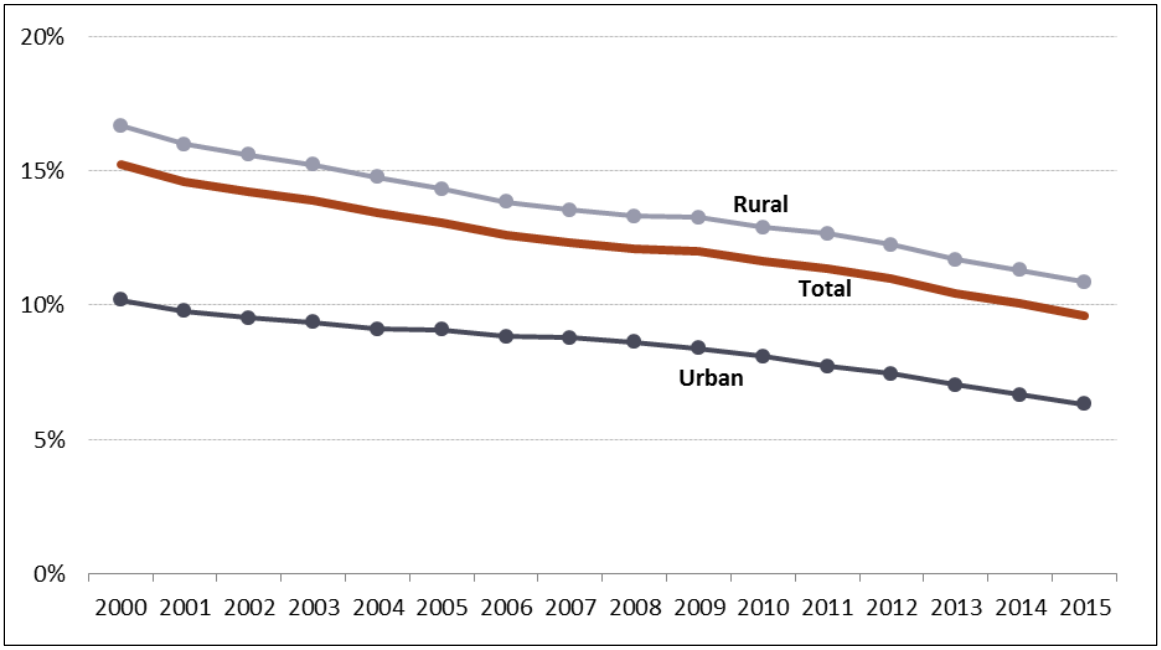
The number of bridges classified as structurally deficient declined from 89,000 in 2000 to about 59,000 in 2015 and fell each year over that period. As of December 2015, about 10% of all bridges were classified as structurally deficient, down from 15% in 2000 (see **Figure 1**).

In terms of the number of bridges, structural deficiency is principally a problem affecting rural areas, particularly bridges on rural minor roads. In 2015, 82% of structurally deficient bridges were in rural areas and 52% of structurally deficient bridges were on rural minor roads. However, structurally deficient bridges in urban areas are generally much larger and, therefore, more expensive to fix. In 2015, 55% of the deck area of structurally deficient bridges was on urban bridges, with 38% on urban Interstates and other principal arterials.

Nevertheless, bridges on Interstate Highways are generally in better condition than those on more lightly traveled routes: 3.7% of urban Interstate Highway bridges were considered structurally deficient in 2015, less than half of the 8.9% structural deficiency rate of urban bridges on local roads.[5] Likewise, 3.3% of rural Interstate Highway bridges were structurally deficient in 2015, about a fifth of the 15.4% structural deficiency rate of rural bridges on local roads.

Figure 1. Structurally Deficient Bridges in the United States, 2000-2015

(percentage of all bridges in category)



Source: Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-28; Federal Highway Administration, National Bridge Inventory.

[5] Interstates are the highest class of roadways in FHWA's functional classification system, and local roads are the lowest.

Bridges on local roads are usually owned by local governments. These bridges had more than twice the structural deficiency rate of state-owned bridges in 2015. Some 13.1% of locally owned bridges were categorized as structurally deficient in 2015, versus 6.0% of state-owned bridges. For bridge deficiency and obsolescence rates by state, see **Appendix A**.

The number of functionally obsolete bridges fell from 91,000 in 2000 to 84,000 in 2015. The share of bridges classified as functionally obsolete in 2015 was 14%. A little less than half of functionally obsolete bridges are in urban areas.

Future Bridge Funding Needs

Every two years or so, 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.[6] As with any attempt to forecast future conditions, a host of simplifying assumptions, omissions, and data problems influence these estimates. Among other things, the estimates rely on forecasts of travel demand and assume that 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 $18.0 billion was spent on bridge construction by governments at all levels in 2010.[7] The vast majority of that amount, $17.1 billion, went to rehabilitate or replace existing bridges, with the remainder devoted to construction of new bridges.[8] The $17.1 billion spent on bridge rehabilitation or replacement in 2010 was an increase of 32% over the $13.0 billion spent in 2008.[9] Bridge construction and rehabilitation spending in 2009 and 2010 was much higher than in prior or subsequent years due largely to one-time funding under the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5).

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. It estimated that fixing all bridge deficiencies existing in 2010 would cost $106.4 billion (in 2010 dollars), which was six times the level of spending in 2010 and over eight times the spending level of 2008, when no ARRA money was available.[10]

Of course, fixing all deficient bridges overnight is not feasible. FHWA, therefore, estimated 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 are seen in **Figure 2**. According to FHWA, to keep the backlog at the 2010 level through

[6] 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.

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

[8] 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 FHWA, Office of Highway Policy Information, Highway Finance Data Collection, "Chapter 12: Report Identifying State Highway Capital Outlay and Maintenance Expenditures," http://www.fhwa.dot.gov/policyinformation/hss/guide/ch12.cfm.

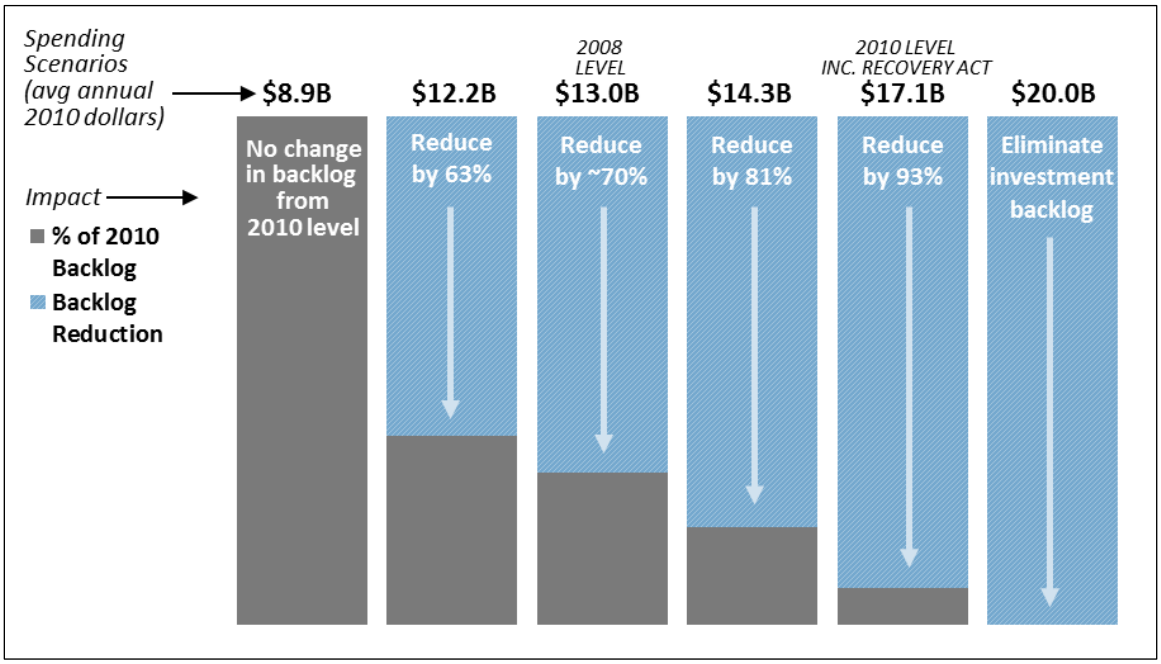
[9] FHWA and Federal Transit Administration, *2013 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, exhibits 6-12 and 6-14. Adjustment to inflation-adjusted 2010 dollars by CRS.

[10] Ibid., exhibit 7-16.

2030 would require $8.9 billion annually (in 2010 dollars). To eliminate the backlog by 2030 would require an investment of $20.2 billion annually. 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. If the $13.0 billion (2010 dollars) spending level of 2008, the year prior to ARRA's enactment, were to continue, the total bridge reconstruction backlog would decline by roughly 70% by 2030.

Figure 2. Effect of Various Spending Levels on Bridge Investment Backlog

(average annual spending, 2011 through 2030, in 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.

Note: CRS calculated the 2008 figure in inflation-adjusted 2010 dollars.

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 determine 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 and performance management measures as part of the decisionmaking process, but otherwise they are free to spend their federal highway funds in any way consistent with federal laws and regulations.[11] Bridge projects are developed at the state

[11] Some of the performance measures are still under development. The notice of proposed rulemaking (NPRM) for System Performance Measures is projected to be released in April 2016. See FHWA, "Transportation Performance Management," https://www.fhwa.dot.gov/tpm/about/schedule.pdf.

level, and state departments of transportation let the contracts, oversee the construction process, and provide for the inspection of bridges.[12]

The Highway Bridge Program, the stand-alone program for highway bridges that was formerly part of the Federal-Aid Highway Program was allowed to expire at the end of FY2012.The current law authorizing highway spending, the 2015 Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94), does not include a program specifically targeting bridges.[13] Instead, the law makes bridge projects eligible for funding from three programs that distribute funds to the states under formulas specified in law: the National Highway Performance Program (NHPP), the Surface Transportation Block Grant Program (STBG), and the National Highway Freight Program (NHFP). Under all three programs, the states determine how much of their federal funding is spent on 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.[14]

Depending on the specific use, funding from other formula programs may also be used on bridge projects on a case-by-case basis. In addition, states are allowed to transfer ("flex") up to 50% of each formula program's apportioned funds to other formula programs.[15] A related discretionary grant program, the Nationally Significant Freight and Highway Projects Program, also may provide funding for large bridge projects that benefit freight movement, on a competitive grant basis.[16]

FHWA is involved in the project decisionmaking process in two significant ways. First, FHWA, in consultation with states and other federal agencies, is required 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 funding programs appear to require that the new classification and risk-based priority metric be used to determine program eligibility. In addition to developing this metric, FHWA imposes certain performance measures that states must meet to avoid funding penalties. For example, if more than 10% of the deck area of a state's bridges on the National Highway System (which consists of the Interstate Highway System and most other principal arterial roads) is structurally deficient, the state is subject to a penalty requiring it to dedicate an amount of its NHPP funds equal to 50% of its FY2009 spending under the former Highway Bridge Program to bridge projects.[17]

Table 1 shows the total obligation of federal funding for bridges, including both funds from the former Highway Bridge Program and those from all other programmatic sources, from FY2008 through FY2015. The table also compares obligations from all programs in current dollars and adjusts these totals to show the impact of project cost inflation during this period.

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[12] CRS Report R44332, *Federal-Aid Highway Program (FAHP): In Brief*, by (name redacted).

[13] CRS Report R44388, *Surface Transportation Funding and Programs Under the Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94)*, coordinated by (name redacted)

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

[15] Metropolitan Planning Program funds and sub-allocated funds under the Surface Transportation Block Grant Program (STBG) are among those shielded from transfer. See FHWA, *Transferability of Apportioned Program Funding under 23 U.S.C. 126*, https://www.fhwa.dot.gov/cfo/23usc126_transferability.cfm.

[16] Unlike the other highway programs discussed in this report, the Nationally Significant Freight and Highway Projects Program is administered by the Office of the Secretary of Transportation, not by FHWA.

[17] For a definition of the National Highway System, see FHWA, National Highway System, "What Is the National Highway System?" http://www.fhwa.dot.gov/planning/national_highway_system/.

Table 1. Trends in Federal Bridge Obligations, FY2008-FY2015

(current and inflation-adjusted dollars in millions)

	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Total (Current $)	$6,837	$9,386	$8,472	$7,043	$6,014	$6,484	$6,803	$6,804
% Change from Previous Year	—	+37%	-10%	-17%	-15%	+8%	+5%	0.0%
Highway Bridge Program	$4,066	$4,212	$4,284	$4,193	$3,575	$961	$221	$243
Other Programs	$2,771	$5,174	$4,188	$2,850	$2,439	$5,523	$6,582	$6,561
Total (Inflation Adjusted, 2009 $)	$7,113	$9,429	$8,380	$6,705	$5,452	$5,695	$5,884	NA
% Change from Previous Year	—	+33%	-11%	-20%	-19%	+4%	+3%	NA
Highway Bridge Program	$4,230	$4,232	$4,238	$3,992	$3,241	$844	$191	NA
Other Programs	$2,883	$5,197	$4,142	$2,713	$2,211	$4,851	$5,693	NA

Sources: FHWA; FY2009-FY2011 total obligations reflect obligation of stimulus funds under the American Recovery and Reinvestment Act of 2009 (P.L. 111-5). Cost adjustments calculated by CRS using Bureau of Economic Analysis, *Price Indexes for Gross Government Fixed Investment by Type, in 2009 dollars.* Weighted average used to approximate fiscal years, which causes FY2009 current-to-adjusted ratios to vary from 1.0.

Notes: For a detailed table of bridge obligations for these years, see **Appendix B**. Totals reflect ongoing obligations of funds under prior authorizations. Totals may not add due to rounding. Highway Bridge Program funding for FY2013-FY2015 reflects funds unobligated when the program was discontinued at the end of FY2012.

Bridge obligation figures from all programs are elevated for FY2009 through FY2011 because of the additional funding provided under ARRA. In FY2012, after most ARRA spending was obligated, the obligation of federal funds for bridges fell 23% below the pre-ARRA FY2008 obligations after adjusting for inflation. The obligation of funds for bridges grew slightly faster than inflation in FY2013 and FY2014. Even so, total obligations for bridges in FY2015, $6,804 billion, were slightly lower than those for FY2008 in current-dollar terms and probably about 20% below obligations in FY2008 after adjusting for inflation.

Bridge Inspection

Under the National Bridge Inspection Program, all bridges longer than 20 feet on public roads must be inspected by qualified inspectors, 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.[18]

[18] 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 FHWA, "Tables of Frequently Requested NBI Information," http://www.fhwa.dot.gov/bridge/britab.cfm.

FHWA sets the standards for bridge inspection through the National Bridge Inspection Standards (NBIS).[19] 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 anyone qualified under the NBIS. The inspectors may be state employees, consultants to the states, or others.
- 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 interval of inspection is every 24 months. States are to identify bridges that require less than a 24-month interval. States can also, however, request FHWA approval to inspect certain bridges on an up to 48-month interval. The interval for an 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 bridge engineers do, at times, perform field reviews 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[20] 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.

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

[19] 23 C.F.R. §650, subpart C.

[20] CRS Report R43384, *Emergency Relief for Disaster-Damaged Roads and Transit Systems: In Brief*, by (name redacted).

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 Emergency Relief Program to 100% (as happened following the 2007 collapse of a bridge on Interstate-35W in Minnesota). As is true with other FHWA programs, the Emergency Relief Program is administered through state departments of transportation in close coordination with FHWA's division office in each state. The program was the source of funds for replacement of the Interstate-10 bridge near Desert Center, CA, which collapsed on July 20, 2015, following flash flooding.

Issues for Congress

Both the washout of the Interstate-10 bridge and the use restriction imposed in 2016 on the Arlington Memorial Bridge, a federally owned bridge between Arlington, VA, and Washington, DC, have led to warnings that the large number of structurally deficient bridges indicates an incipient crisis.[21] 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, in particular urban roads, has not experienced the same degree of improvement as the condition of bridges.[22] This disparity raises the policy question of what priority should go to bridge repairs as opposed to roadway repairs. In the Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), Congress implicitly addressed this issue by giving states greater flexibility to use federal funding for roads or for bridges, at their discretion. In doing so, Congress chose not to mandate any specific level of spending on bridges (**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 efficiency. *Structurally deficient* bridges are not *unsafe* bridges, and an effort to eliminate all structurally deficient bridges could quickly lead to spending on relatively low-priority projects that do not present major safety problems. MAP-21 directs FHWA to develop performance measures in regard to bridges. The speed of the measures' development, the effectiveness of implementation, and whether the measures fulfill the intent of Congress may be oversight issues.[23]

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[21] See, for example, "Collapsed California Bridge Earned 'A' Rating Just Last Year," *USA Today*, July 21, 2015, http://www.usatoday.com/story/news/nation/2015/07/20/collapsed—10-bridge-given-rating-just-last-year/30428515/.; "Memorial Bridge, symbol of U.S. strength, is corroded, partly shut down," *Washington Post*, May 30, 2015, https://www.washingtonpost.com/local/trafficandcommuting/memorial-bridge-symbol-of-us-strength-is-corroded-partly-shut-down/2015/05/28/bbe0e9b0-0582-11e5-a428-c984eb077d4e_story.html; "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.

[22] See also U.S. Congressional Budget Office, *Approaches to Make Federal Highway Spending More Productive*, February 2016, pp. 1-50, https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/50150-Federal_Highway_Spending-OneCol.pdf.

[23] U.S. Dept. of Transportation, Office of the Inspector General, *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. FHWA has completed most of the actions identified to implement the Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141) safety and funding provisions. Most performance management areas are expected to be under a final rule by September 2016. The projected date for the system performance measures NPRM is April 2016.

Federal Pressure for State Bridge Spending

To encourage state spending on structurally deficient bridges, current law sets a penalty threshold under the NHPP. According to this penalty threshold, 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 therefore less on roadway projects) due to this penalty, its mandated spending on deficient bridges would be less than was required prior to expiration of the Highway Bridge Program in FY2012.

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 Surface Transportation Program or NHPP funds on non-bridge projects is obstructing the declared national policy of reducing the number of deficient bridges.

Providing More Money for Bridges

The passage of the FAST Act, which funds the Federal–Aid Highway program through FY2020, provided for an increase of 2.4% above the amount authorized under previous legislation, adjusted for expected inflation. This increased funding is the most important aspect of the FAST Act in regard to bridges. As it conducts oversight of the implementation of the FAST Act, Congress may want to monitor states' patterns of bridge spending. The underlying question is whether the policy of allowing the states to decide how much of their federal-aid highway funding to spend on bridges, with only modest penalties for underfunding, is accomplishing the congressional policy of systematically rehabilitating or replacing deficient bridges.[24]

Tolling of Non-tolled Bridges

Wider use of tolling could allow for more rapid improvement of major bridges. Heavily traveled bridges can be attractive targets for conversion to toll facilities; many bridges have no convenient alternatives, so drivers may find it difficult to avoid paying whatever toll is imposed. The revenue stream provided by tolls can make bridge building and reconstruction an attractive investment for private entities that are interested in participating in a public-private partnership. Tolling can also help projects become eligible for a federal Transportation Infrastructure Finance and Innovation Act 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.[25]

Currently, any non-Interstate bridge on the federal-aid highway system may be converted to a toll facility if the conversion is related to the reconstruction of a previously non-tolled bridge. New bridges, including bridges on new segments of Interstate Highways, may be tolled as well. Added lane capacity on a bridge may be tolled as long as the number of free lanes remains the same. For

[24] This policy is specified in 23 U.S.C. §144.

[25] CRS Report R43575, *Tolling U.S. Highways*, by (name redacted)

any existing federal-aid bridge to be converted to tolling, it must undergo reconstruction or replacement.[26]

Spending on 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," that is, on relatively small bridges on roads that are not part of the 1.02 million-mile federal-aid system.[27] Off-system spending of federal bridge funds has been required in every highway authorization bill since 1978. Under current law, STBG 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. The set-aside for off-system projects has been strongly supported by predominantly rural states and by many county and town governments.

The FAST Act made a change in bridge project eligibility under the NHPP program. Previously, NHPP funds were limited to bridges on the 226,355-mile National Highway System. The FAST Act allows NHPP funds to be used for bridge projects on a much larger network, the 1.02 million-mile federal-aid highway system. Allowing these bridges to be funded from NHPP rather than STBG funds should make it easier for states to use their STBG funds for bridges that are not on the federal-aid highway system.

Bridge Improvement Type

Of the funds both authorized and obligated for FY2014, from all FHWA sources, 9% were obligated for new bridges, 51% were obligated for bridge replacement, 7% were for major rehabilitation, and 33% were for minor bridge work. These funds supported projects on 5,173 bridges. The 60% combined share obligated for both new and replacement bridges was less than in the late 1990s, when it approached 70%.The share of spending for major bridge rehabilitation has also fallen since the late 1990s. Meanwhile, four times the proportion of federal funding went to minor bridge work in FY2014 as in the 1990s.[28]

The shift in spending of federal funds from large bridge construction projects to minor rehabilitation projects could be due to the falling number of deficient bridges, but it also could indicate that states are favoring less expensive projects and delaying some new bridges or bridge replacements because of the higher cost of these projects. Examining the trends in spending by improvement type could reveal state bridge priorities.

[26] The exception to this requirement would be to convert all or some of the bridge lanes to a congestion pricing facility under the Value Pricing Pilot Program.

[27] FHWA, "Public Road Length-2014(1): Miles by Ownership and Federal-aid Highways," National Summary Table HM-16, *Highway Statistics 2014*, October 2015, http://www.fhwa.dot.gov/policyinformation/statistics/2014/hm16.cfm. The total public road length in the U.S. for 2014 was 4.18 million miles.

[28] FHWA, "Obligation of Federal Funds for Bridge Projects Underway by Improvement Type," *Highway Statistics*, various years, and *Highway Statistics 2014, Table FA-10*. Based on data from Table FA-10 for FY1996-FY1999, obligation for minor bridge rehabilitation relative to total bridge obligations for the years was 6% for FY1996, 8% for FY1997, 7% for FY1998, and just below 10% for FY1999.

Federal Lands and Tribal Bridges

Funding for bridges owned by the federal government or by Indian tribes does not come from the regularly apportioned programs discussed above. Funding is authorized separately, primarily from two stand-alone programs: the Tribal Transportation Program[29] and the Federal Lands Transportation Program. The Tribal Transportation Program funds are under the control of the tribes, in cooperation with the Department of the Interior and the Department of Transportation. The Federal Lands Transportation Program funds are under the control of the federal land management agencies, with assistance and oversight from the Department of Transportation. A third program, the Federal Lands Access Program, funds facilities that provide access to federal lands. Its funding decisions are made by a state committee that includes representatives of FHWA, the state department of transportation, and a political subdivision of the state.

Compared to the core formula programs, these programs are small. Under the FAST Act, an average of $485 million annually is available to the Tribal Transportation Program. The $355 million annual average Federal Lands Transportation program authorization is divided among the National Park Service ($284 million), the Fish and Wildlife Service ($30 million), the U.S. Forest Service ($17 million), and other federal land management agencies ($24 million). These funds must cover both road and bridge needs as well as any public transportation funding. These programs are paid for from the Highway Trust Fund.

The structure for funding bridges on federal and tribal land has given rise to some complications, such as those relating to the rehabilitation of Arlington Memorial Bridge. The bridge is owned by the National Park Service. Therefore, the work would logically be paid out of the Park Service's funding under the Federal Lands Transportation Program, but the cost is expected to run as high as $250 million, nearly as much as the Park Service receives each year for all highway needs.[30] The FAST Act established the Nationally Significant Federal Lands and Tribal Projects Program, authorized at $100 million annually, to provide an extra source of funds for large projects on federal or tribal lands, but this money is subject to appropriation each year. Congress may wish to consider the adequacy of funding for large federal lands bridge projects such as Arlington Memorial Bridge.

Oversight and Inspection Issues[31]

Risk-Based Approach to Federal Bridge Oversight

MAP-21 required 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. This risk-based approach, which is still under development by FHWA,[32] could provide statistics that more clearly identify which bridges most deserve federal funding. Once the metric is developed,

[29] CRS Report R44359, *Highways and Highway Safety on Indian Lands*, by (name redacted) .

[30] National Park Service, *Arlington Memorial Bridge Repair & Reconstruction*, 2016, https://www.nps.gov/transportation/pdfs/Memorial_Bridge_MP-Summary.pdf.

[31] See also FHWA, "Tables of Frequently Requested NBI Information," http://www.fhwa.dot.gov/bridge/britab.cfm.

[32] The anticipated final rule is expected in September 2016 (see FHWA, "Transportation Performance Management," https://www.fhwa.dot.gov/tpm/about/schedule.pdf). Previously, a 0%-100% "sufficiency" (to be in service) rating was determined for each bridge. This rating alone, however, did not determine which bridges were replaced or reconstructed.

Congress could consider making its use an eligibility requirement for bridge project funding under NHPP and STP. A major oversight question is whether or not the states choose to use the new priority ranking system.

Inspection Auditing

FHWA could be directed to take a more active role in ensuring that inspections performed by the states or their contractors are done in conformance with the NBIS. This step might involve on-site audits of state inspections, and it could require additional funding for FHWA to hire more engineers and support personnel at its division offices and dedicate additional resources to oversight of the inspection program.

Inspector Training and Personnel Qualifications

Current law includes requirements for the establishment of minimum inspection standards and an annual review of state compliance with the standards established in MAP-21. As of October 1, 2015, the Secretary of Transportation was to update the NBIS, including those governing the methodology, training, and qualifications of inspectors. The rule is expected to be issued in late 2016.[33] Congress may wish to oversee implementation of these provisions and to monitor their effectiveness.

[33] FHWA, #25 *National Bridge Inspection Standards (MAP-21)*, the schedule is available at https://www.transportation.gov/regulations/report-on-significant-rulemakings.

Appendix A. Bridge Condition by State

(data as of December 2015)

State	All Bridges (number)	Structurally Deficient (number)	Functionally Obsolete (number)	Percentage of Bridges in State	
				Structurally Deficient	Functionally Obsolete
Alabama	16,095	1,353	2,115	8%	13%
Alaska	1,493	148	434	10%	29%
Arizona	8,056	246	673	3%	8%
Arkansas	12,853	845	2,012	7%	16%
California	25,318	2,009	4,419	8%	17%
Colorado	8,624	521	851	6%	10%
Connecticut	4,225	357	1,087	8%	26%
Delaware	875	48	129	5%	15%
District of Columbia	254	10	164	4%	65%
Florida	12,198	251	1,760	2%	14%
Georgia	14,790	729	1,623	5%	11%
Hawaii	1,142	60	435	5%	38%
Idaho	4,369	385	450	9%	10%
Illinois	26,674	2,244	1,959	8%	7%
Indiana	19,145	1,717	2,310	9%	12%
Iowa	24,242	5,025	1,071	21%	4%
Kansas	25,047	2,303	1,791	9%	7%
Kentucky	14,261	1,183	3,198	8%	22%
Louisiana	13,012	1,838	1,959	14%	15%
Maine	2,431	361	470	15%	19%
Maryland	5,313	306	1,078	6%	20%
Massachusetts	5,167	461	2,231	9%	43%
Michigan	11,086	1,299	1,745	12%	16%
Minnesota	13,301	810	375	6%	3%
Mississippi	17,057	2,184	1,263	13%	7%
Missouri	24,398	3,222	3,059	13%	13%
Montana	5,243	411	503	8%	10%
Nebraska	15,341	2,474	984	16%	6%
Nevada	1,919	35	219	2%	11%
New Hampshire	2,470	312	453	13%	18%
New Jersey	6,686	596	1,714	9%	26%
New Mexico	3,960	267	359	7%	9%

State	All Bridges (number)	Structurally Deficient (number)	Functionally Obsolete (number)	Percentage of Bridges in State	
				Structurally Deficient	Functionally Obsolete
New York	17,461	1,990	4,698	11%	27%
North Carolina	18,124	2,085	3,089	12%	17%
North Dakota	4,401	692	227	16%	5%
Ohio	27,104	1,893	4,278	7%	16%
Oklahoma	23,049	3,776	1,586	16%	7%
Oregon	8,037	417	1,437	5%	18%
Pennsylvania	22,783	4,783	4,319	21%	19%
Rhode Island	766	178	251	23%	33%
South Carolina	9,344	1,004	848	11%	9%
South Dakota	5,866	1,156	232	20%	4%
Tennessee	20,106	1,026	2,607	5%	13%
Texas	53,209	1,008	8,928	2%	17%
Utah	3,019	95	386	3%	13%
Vermont	2,749	190	658	7%	24%
Virginia	13,884	1,063	2,517	8%	18%
Washington	8,158	385	1,719	5%	21%
West Virginia	7,215	1,092	1,462	15%	20%
Wisconsin	14,134	1,282	742	9%	5%
Wyoming	3,085	370	279	12%	9%
Puerto Rico	2,306	296	968	13%	42%
Total (incl. Puerto Rico)	**611,845**	**58,791**	**84,124**	**10%**	**14%**

Source: Federal Highway Administration, *National Bridge Inventory, Highway Bridges by State and Highway System 2015*, https://www.fhwa.dot.gov/bridge/nbi/no10/defbr15.cfm.

Appendix B. Bridge Obligations by FHWA Program: FY2008-FY2015

(current dollars)

Program	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Interstate Maintenance	531,148,044	456,257,769	659,096,900	583,304,527	755,656,556	129,051,722	40,227,615	11,385,907
National Highway System	870,072,229	597,997,506	863,300,679	836,649,803	680,253,396	88,777,186	55,653,947	55,928,169
Surface Transportation Program	547,815,377	708,246,051	603,721,498	586,685,394	558,073,243	1,662,455,267	2,211,511,901	2,254,453,670
National Highway Performance Program	—	—	—	—	—	3,018,008,912	3,673,113,345	3,638,484,037
Transportation Alternatives	—	—	—	—	—	138,881	4,620,618	2,368,351
Bridge Programs	4,066,121,536	4,211,724,679	4,283,730,495	4,193,314,245	3,575,482,507	960,648,620	220,620,109	243.314,396
Congestion Mitigation and Air Quality	52,369,318	8,579,895	47,636,428	91,470,609	(10,213,853)	72,343,225	41,677,322	62,542,855
Appalachian Development Highway System	449,969	61,133,266	30,653,664	28,236,759	5,436,959	24,767,784	16,374,183	51,015,156
High Priority Projects	188,500,355	226,877,040	150,934,801	224,452,978	61,045,589	—	31,470,461	10,125,976
Minimum Guarantee—TEA-21	(6,841,861)	(5,295,640)	(14,994,995)	(16,498,678)	12,053,469	9,919,033	2,720,538	10,404,647
Equity Bonus Exempt Lim	23,363,153	96,050,658	35,326,437	14,007,551	59,268,059	451,407,959	220,471,325	211,958,856
Coordinated Border Infrastructure Program	11,580,237	23,208,473	23,039,215	30,457,277	10,461,126	3,049,907	84,377,062	2,569,474
Safe Routes to School	—	—	—	—	—	—	__	694,649
Planning and Research	—	—	—	—	(200,000)	—	__	—
All Others	552,598,820	3,000,825,716	1,789,136,040	470,519,916	306,635,541	63,018,956	200,128,997	248,261,223
Total	6,837,177,177	9,385,605,414	8,471,581,163	7,042,600,382	6,013,952,592	6,483,587,452	6,802,967,421	6,803,507,367

Source: Federal Highway Administration (FHWA). Displays funds from Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), as extended, as well as ongoing obligation of funds from earlier authorization acts.

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