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Highway Bridge Conditions: Issues for Congress

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Summary

The sudden catastrophic failure of the I-5 Interstate System bridge in Washington State on May 23, 2013, has raised policy concerns in Congress regarding the condition of the nation's transportation infrastructure in general, and in particular the federal role in funding, building, maintaining, and ensuring the safety of roads and especially bridges in the United States.

Of the 607,000 public road bridges, about 67,000 (11%) were classified as structurally deficient in 2012, and another 85,000 (14%) were classified as functionally obsolete. This is less than half the number classified as structurally deficient in 1990 and 16% less than were classified as functionally obsolete. Structurally deficient and functionally obsolete bridges are not necessarily unsafe. Nonetheless, public concern about bridge safety in the wake of the I-5 bridge collapse raises the policy question of how quickly these bridges should be replaced or improved. At current annual spending levels, the Federal Highway Administration (FHWA) estimates that the bridge investment backlog (in dollar terms) would be reduced by 11% by 2028. Reducing the backlog to near zero during the same period is estimated to require an annual spending rate roughly 60% higher than recent levels.

The most recent highway bill, the Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), 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 the following:

- Given the steady decline in the number of structurally deficient bridges during recent decades, should Congress take action to accelerate the improvement of the remaining deficient bridges?
- If Congress wishes to accelerate the reduction in the number of deficient bridges under MAP-21, what can it do to encourage the states to spend more of their federal funds on their deficient bridges?
- Given the context of large projected shortfalls in highway trust fund revenues relative to spending, should Congress encourage increased spending on highway bridges through increased use of tolling and public private partnerships (PPPs)?
- Should Congress consider legislation to 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 607,000 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 36% of average daily traffic in 2012.[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 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 current 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 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 54% since 1990, and fell every year between 1990 and 2012 (see **Figure 1**). In 2012, approximately 67,000 bridges, or 11% of the total number of bridges, were classified as structurally deficient, as compared 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. U.S. Department of Transportation, Federal Highway Administration, "Bridges by Owner, December 2012," 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. U.S. Department of Transportation, Federal Highway Administration, "Functional Classification of Bridges by Highway System, 2012 Count," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

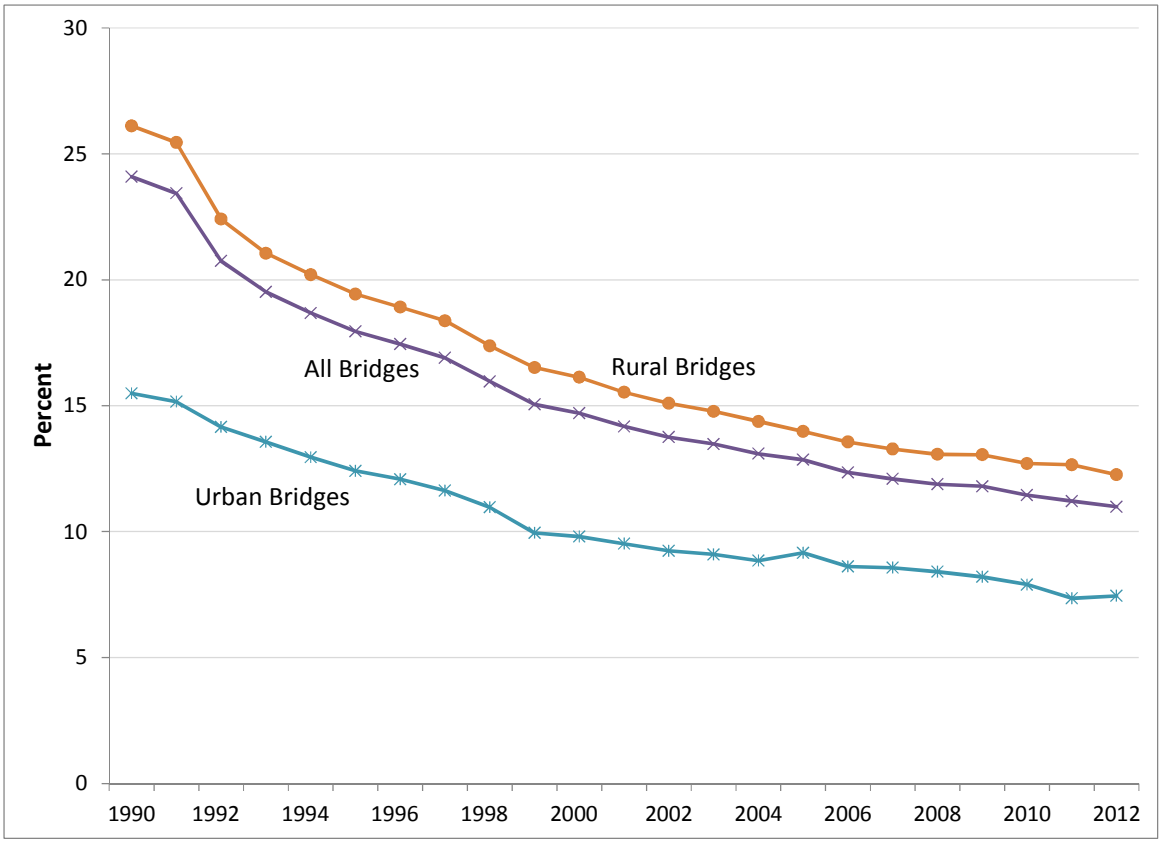
[3] U.S. Department of Transportation, Federal Highway Administration, "Functional Classification of Bridges by Highway System, 2012 ADT," National Bridge Inventory, http://www.fhwa.dot.gov/bridge/britab.cfm.

[4] U.S. Department of Transportation, Federal Highway Administration, and Federal Transit Administration, *2010 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, Washington, DC, 3-10, http://www.fhwa.dot.gov/policy/2010cpr/pdfs.htm.

138,000 in 1990. The number of functionally obsolete bridges declined by 16% over the same period.

Figure 1. Structurally Deficient Bridges in the United States, 1990-2012

Percent of All Bridges in Category



Source: 1990-2010: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-28; 2011-2012: U.S. Department of Transportation, Federal Highway Administration, National Bridge Inventory, "Count, Area, and Length of Bridges by Highway System."

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, 4.7% of urban interstate bridges were considered structurally deficient in 2012, about half of the 9.8% structural deficiency rate of urban bridges on local roads. Likewise, 4.1% of rural Interstate Highway bridges were structurally deficient in 2012, about a quarter of the 17.2% 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 2012. Some 14.8% of locally owned bridges were categorized as structurally deficient in 2012, versus 7.0% 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, there is a host of simplifying assumptions, omissions, and data problems that influence the estimates of future funding needs. Among other things, the estimates of future needs rely on forecasts of travel demands 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 2010 needs assessment, the most recent available, shows that, in 2008, $91.1 billion was spent on capital improvements to the nation's highways and bridges.[6] Of that amount, $76.8 billion was spent on roadways and $14.3 billion was spent on bridges. The vast majority of the expenditure on bridges, $12.8 billion, went to rehabilitate or replace existing bridges, with the remainder devoted to construction of new bridges.[7]

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 $12.8 billion expenditure in 2008. The U.S. Department of Transportation (DOT) estimates that fixing all existing bridge deficiencies would cost $121.2 billion (in 2008 dollars).[8]

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 2008-2028 period, taking into account the deterioration of existing bridges over that period. The results of this analysis can be seen in **Table 1**. To keep the backlog at the 2008 level through 2028 would require $11.9 billion annually (in 2008 dollars), less than the level of spending in 2008. To eliminate the backlog by 2028, the maximum economically justified level of investment would be $20.5 billion annually, implying roughly a 4% annual increase in inflation-adjusted spending. Spending between $11.9 billion and $20.5 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 2008, $12.8 billion per year, the total dollar cost of correcting all remaining deficiencies would decline by 11% by 2028.

[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] U.S. Department of Transportation, *Conditions and Performance*, 2010, exhibit 6-11.

[8] U.S. Department of Transportation, *Conditions and Performance*, 2010, 7-27.

Table 1. Projected Changes in 2028 Bridge Investment Backlog Compared with 2008 Levels for Different Possible Funding Levels

Annual Percentage Change in Spending	Average Annual Spending (Billion 2008 Dollars)	2028 Backlog (Billion 2008 Dollars)	Percentage Change from 2008	Funding Level Description
4.31%	20.5	0	-100.0%	Maximum economic investment scenario
3.51%	18.7	25.3	-79.1%	
2.88%	17.5	42.0	-65.3%	
1.31%	14.7	79.1	-34.7%	
0.56%	13.6	95.8	-20.9%	
0.00%	12.8	107.6	-11.2%	2008 spending on existing bridges
-0.70%	11.9	121.2	0%	Maintain investment backlog
-1.00%	11.5	127.1	4.9%	

Source: U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration, *2010 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, exhibit 7-17.

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.[9]

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.[10]

[9] See CRS Report R42793, *Federal-Aid Highway Program (FAHP): In Brief*, by Robert S. Kirk.

[10] See CRS Report R41746, *Earthquake Risk and U.S. Highway Infrastructure: Frequently Asked Questions*, by William J. Mallett, Nicole T. Carter, and Peter Folger.

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.[11] 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.[12]

While the HBP existed, bridge program apportionments—the money states were entitled to receive each year under the HBP—were trending upward. The obligation of funds for 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 obligations 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. The totals obligated from all Federal-Aid Highway programs (FAHP) for bridge work exceeded the HBP gross apportionments for the years FY2007-FY2012. **Table 2** shows the gap between the gross apportionments and the amounts obligated under the HBP, as well as the total obligations from all FAHP sources for FY2007 through FY2012. Past spending on bridge improvement may provide useful benchmarks of state spending efforts during congressional oversight.

Table 2. HBP Apportionments/Obligations and Obligations from All FAHP Sources: FY2007-2012

Dollars in Millions

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
HBP Apportionments (gross)	$5,041	$5,058	$5,177	$5,612	$5,897	$5,509
HBP Obligations	$3,761	$4,066	$4,212	$4,284	$4,193	$3,575
Total: All Federal-Aid Highway Programs' Bridge Obligations	$6,418	$6,837	$9,386	$8,472	$7,043	$6,014

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**.

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. Although there is no freestanding bridge program under MAP-21, FHWA is able to track the obligation of federal funds for bridge activities using bridge improvement type codes in its FMIS database.

[11] 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.

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

Bridge Inspection

Under the National Bridge Inspection Program (NBIP), all bridges on public roads longer than 20 feet 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.[13]

FHWA sets the standards for bridge inspection through the National Bridge Inspection Standards (NBIS).[14] 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.
- 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 the 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.

[13] 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.

[14] 23 C.F.R. 650 subpart C.

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.[15] 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 for 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 that collapsed on May 23, 2013, after being struck by a truck that was hauling an oversized load.

Issues for Congress

The I-5 bridge collapse on May 23, 2013, led to warnings that the large number of structurally deficient bridges indicates an incipient crisis,[16] even though the I-5 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

[15] For a more detailed discussion of the ER program, see CRS Report R42804, *Emergency Relief Program: Federal-Aid Highway Assistance for Disaster-Damaged Roads and Bridges*, by Robert S. Kirk.

[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 *National Bridge Inventory: Structure Inventory and Appraisal; WA Structure: 000047940000000*, Federal Highway Administration.

bridges by a certain date or eliminate deficient bridges altogether (described in **Table 1**). 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.

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 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.

MAP-21 expires at the end of FY2014. Given the lags in state reporting and the time required to complete major bridge projects, it may not be clear at that point 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. It is conceivable that Congress will begin debating surface transportation reauthorization with limited data on the success or failure of MAP-21 in regard to bridge improvement.

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. If it wishes to increase spending on bridges following the expiration of MAP-21, Congress has a number of options:

- Provide general fund monies to accelerate the repair of the remaining 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 just to a federal bridge program.

- Emphasize public-private partnerships (PPPs) 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. Congress might consider tolling as a means of accelerating the pace of bridge repair under the current constrained budgetary environment. 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 PPP. The revenue stream also 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 part of every highway authorization bill ever since. Under MAP-21, STP funds not less than 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 used for bridges be directed to bridges with relatively low sufficiency ratings may encourage states to substitute bridge replacement for maintenance-type projects. During FY2011, of the total obligation of federal funds from all FHWA sources, 15% was obligated for new bridges, 56% was obligated for bridge replacement, 3% was for major rehabilitation, and 24% 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.[18] Still, the case can be made that as the

[18] Federal Highway Administration, "Obligation of Federal Funds for Bridge Projects Underway by Improvement Type," *Highway Statistics*, Washington, FHWA, various years, and *Highway Statistics 2011, Table FA-10*.

number of deficient bridges decreases, rather than reducing bridge spending it might make sense to shift the focus on the spending over time toward preventive maintenance.

Oversight and Inspection Issues[19]

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. Once the 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.

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

Appendix A. Bridge Condition by State

Table A-1. Bridge Condition by State as of December 2012

State	All Bridges (number)	Structurally Deficient (number)	Functionally Obsolete (number)	Percent of Bridges in State	
				Structurally Deficient	Functionally Obsolete
Alabama	16,070	1,448	2,205	9%	14%
Alaska	1,173	128	147	11%	13%
Arizona	7,835	247	721	3%	9%
Arkansas	12,696	898	2,031	7%	16%
California	24,812	2,978	4,178	12%	17%
Colorado	8,591	566	907	7%	11%
Connecticut	4,208	406	1,070	10%	25%
Delaware	862	53	122	6%	14%
District of Columbia	239	30	155	13%	65%
Florida	11,982	262	1,764	2%	15%
Georgia	14,739	878	1,871	6%	13%
Hawaii	1,131	146	359	13%	32%
Idaho	4,214	397	440	9%	10%
Illinois	26,514	2,311	1,976	9%	7%
Indiana	18,789	2,036	2,188	11%	12%
Iowa	24,496	5,193	1,282	21%	5%
Kansas	25,176	2,658	1,959	11%	8%
Kentucky	14,031	1,244	3,219	9%	23%
Louisiana	13,175	1,783	2,032	14%	15%
Maine	2,408	356	436	15%	18%
Maryland	5,294	368	1,099	7%	21%
Massachusetts	5,120	493	2,214	10%	43%
Michigan	11,000	1,354	1,672	12%	15%
Minnesota	13,121	1,190	423	9%	3%
Mississippi	17,061	2,417	1,357	14%	8%
Missouri	24,334	3,528	3,365	14%	14%
Montana	5,120	399	509	8%	10%
Nebraska	15,393	2,779	1,058	18%	7%
Nevada	1,798	40	216	2%	12%
New Hampshire	2,429	362	445	15%	18%
New Jersey	6,554	651	1,717	10%	26%
New Mexico	3,924	307	350	8%	9%

State	All Bridges (number)	Structurally Deficient (number)	Functionally Obsolete (number)	Percent of Bridges in State	
				Structurally Deficient	Functionally Obsolete
New York	17,420	2,169	4,718	12%	27%
North Carolina	18,165	2,192	3,296	12%	18%
North Dakota	4,453	746	247	17%	6%
Ohio	27,045	2,462	4,311	9%	16%
Oklahoma	23,781	5,382	1,604	23%	7%
Oregon	7,633	433	1,341	6%	18%
Pennsylvania	22,669	5,540	4,370	24%	19%
Rhode Island	757	156	255	21%	34%
South Carolina	9,271	1,141	840	12%	9%
South Dakota	5,870	1,208	237	21%	4%
Tennessee	19,985	1,195	2,669	6%	13%
Texas	52,260	1,372	8,680	3%	17%
Utah	2,947	126	343	4%	12%
Vermont	2,727	288	643	11%	24%
Virginia	13,769	1,250	2,421	9%	18%
Washington	7,840	366	1,693	5%	22%
West Virginia	7,093	952	1,595	13%	22%
Wisconsin	14,057	1,157	779	8%	6%
Wyoming	3,101	426	287	14%	9%
Puerto Rico	2,248	282	932	13%	41%
Total (incl. Puerto Rico)	**607,380**	**66,749**	**84,748**	**11%**	**14%**

Source: U.S. Department of Transportation, Federal Highway Administration, National Bridge Inventory, Deficient Bridges by State and Highway System, Washington, DC.

Appendix B. Bridge Obligations by Program: FY2007-FY2012

Table B-1. Bridge Obligations by Program

FY2007-FY2012

Program	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	Total, FY2007-FY2012
Interstate Maintenance	566,367,740	531,148,044	456,257,769	659,096,900	583,304,527	755,656,556	3,020,683,491
National Highway System	629,914,133	870,072,229	597,997,506	863,300,679	836,649,803	680,253,396	3,608,115,518
Surface Transportation Program	476,908,635	547,815,377	708,246,051	603,721,498	586,685,394	558,073,243	2,933,634,820
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	20,025,304,142
Congestion Mitigation And Air Quality	23,905,076	52,369,318	8,579,895	47,636,428	91,470,609	(10,213,853)	161,378,157
Appalachian Development Highway System	19,971,806	449,969	61,133,266	30,653,664	28,236,759	5,436,959	145,432,455
Recreational Trails	—	—	—	—	—	—	—
Metropolitan Planning	—	—	—	—	—	—	—
1% Metropolitan Planning	—	—	—	—	—	—	—
High Priority Projects	141,223,886	188,500,355	226,877,040	150,934,801	224,452,978	61,045,589	804,534,295
Minimum Guarantee—TEA-21	70,261,361	(6,841,861)	(5,295,640)	(14,994,995)	(16,498,678)	12,053,469	45,525,517
Equity Bonus Exempt Lim	55,196,232	23,363,153	96,050,658	35,326,437	14,007,551	59,268,059	259,848,937
Coordinated Border Infrastructure Program	41,711	11,580,237	23,208,473	23,039,215	30,457,277	10,461,126	87,207,802
Safe Routes To School	—	—	—	—	—	—	—
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	6,240,369,898
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	37,331,835,031

Source: Federal Highway Administration.

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