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HIGHWAY BRIDGE PROGRAM

Clearer Goals and Performance Measures Needed for a More Focused and Sustainable Program

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Physical Infrastructure Issues





Highlights of [GAO-08-1127T](#), a testimony before the Committee on Environment and Public Works, U.S. Senate

Why GAO Did This Study

The August 1, 2007, collapse of a Minnesota bridge raised nationwide questions about bridge safety and the Department of Transportation's (DOT) prioritization of bridge resources. The Highway Bridge Program (HBP), the primary source of federal funding for bridges, provided over \$4 billion to states in fiscal year 2007. This testimony, based on a report GAO is releasing today, addresses (1) how states use HBP funds and select bridge projects for funding, (2) what data indicate about bridge conditions and the HBP's impact, and (3) the extent to which the HBP aligns with principles we developed, based on our prior work and federal laws and regulations, for re-examining surface transportation programs. The testimony also discusses the implications of our work for related sections of proposed legislation under review by this committee, the National Highway Bridge Reconstruction and Inspection Act of 2008 (S.3338).

What GAO Recommends

In the report released today, GAO made recommendations to improve the focus, performance, and sustainability of the HBP and DOT officials said they generally agreed with those recommendations. The DOT officials also commented that GAO's principles had broader applicability than the HBP, noting that they had incorporated the principles into the department's recent proposal for reforming surface transportation programs.

To view the full product, including the scope and methodology, click on [GAO-08-1127T](#). For more information, contact Katherine Siggerud at (202) 512-2834 or siggerudk@gao.gov.

HIGHWAY BRIDGE PROGRAM

Clearer Goals and Performance Measures Needed for a More Focused and Sustainable Program

What GAO Found

As context for understanding GAO's findings on the HBP, based on information gathered during bridge inspections that are generally conducted every 2 years, the HBP classifies bridge conditions as deficient or not; assigns each bridge a sufficiency rating reflecting its structural adequacy, safety, serviceability, and relative importance for public use; and uses that information to distribute funding to states to improve bridges. Deficient bridges include those that are structurally deficient, with one or more components in poor condition, and those that are functionally obsolete, with a poor configuration or design that may no longer be adequate for the traffic they serve.

Use of HBP funds and project selection: The HBP affords states discretion to use HBP funds and select bridge projects in a variety of ways. Some states are focused on reducing their number of deficient bridges, while other states are pursuing different bridge priorities. For example, California has focused on seismically retrofitting bridges, a safety concern for that state. Furthermore, some states have developed tools and approaches for selecting bridge projects that go beyond those required by the HBP—such as bridge management systems and state-specific bridge condition rating systems.

Bridge conditions and impact of HBP: Bridge conditions, as measured by the number of deficient bridges and average sufficiency rating of all bridges, improved from 1998 through 2007. However, the impact of the HBP on that improvement is difficult to determine because (1) the program provides only a share of what states spend on bridges and there are no comprehensive data for state and local spending on bridges and (2) HBP funds can, in some cases, be used for a variety of bridge projects without regard to a bridge's deficiency status or sufficiency rating.

Alignment of HBP with GAO principles: The HBP does not fully align with GAO's principles in that the program lacks focus, performance measures, and sustainability. For example, the program's statutory goals are not focused on a clearly identified federal interest, but rather have expanded from improving deficient bridges to supporting seismic retrofitting, preventive maintenance, and many other projects, thus expanding the federal interest to potentially include almost any bridge in the country. In addition, the program lacks measures linking funding to performance and is not sustainable, given the anticipated deterioration of the nation's bridges and the declining purchasing power of funding currently available for bridge maintenance, rehabilitation, and replacement.

The results of our work are generally consistent with provisions of S.3338 that call for a risk-based prioritization process for selecting bridge projects, 5-year performance plans, and bridge management systems. Our work does raise some questions about the legislation's focus on all deficient bridges because some deficient bridges do not need immediate repairs to carry traffic safely.

Chairman Boxer and Members of the Committee:

I am pleased to be here today to participate in this hearing on federal efforts to address the condition of our nation's bridges. The August 1, 2007, collapse of the I-35W bridge in Minneapolis, Minnesota, raised questions about the condition and safety of our nation's bridges and about the federal government's ability to prioritize resources for bridges. Bridges are critical elements of the nation's transportation network, supporting commerce, economic vitality, and personal mobility. The Federal Highway Administration's (FHWA) Highway Bridge Program (HBP), the primary source of federal funding for bridges, provided over \$4 billion to states in fiscal year 2007. This program, which provides funding assistance to states to improve the condition of their bridges, specifies a large variety of activities that states may undertake with program funds.¹

Since the Minnesota bridge collapse, there have been calls for increased federal investment in bridge infrastructure. In July 2008, the House of Representatives passed H.R. 3999, the National Highway Bridge Reconstruction and Inspection Act of 2008, authorizing an additional \$1 billion for fiscal year 2009² from the U.S Treasury's general fund³ to address bridges, and shortly thereafter, a Senate companion bill to that legislation (S. 3338) was introduced in this committee. These calls for increased investment in bridge infrastructure coincide with strains on traditional funding for infrastructure projects because the Highway Trust Fund, which funds the HBP and other highway programs, is projected to incur significant deficits in the years ahead. We have also recently called for a fundamental re-examination of surface transportation programs and commitments to address emerging needs by eliminating outdated or

¹States may use HBP funds for seven types of bridge-related activities, including replacement, rehabilitation, painting, seismic retrofitting, systematic preventive maintenance, installation of scour countermeasures (to address the effects of sediment erosion around bridge piers and abutments), and anti-icing or deicing activities.

²The \$1 billion represents an amount in addition to what was authorized for 2009 for HBP and other related programs in the most recent surface transportation authorizing legislation enacted in 2005.

³The federal budget consists of several types of funds, including the general fund, trust funds (such as the Highway Trust Fund), and others. General funds are federal revenues not designated for specific purposes and they are used to fund, among other things, national defense, interest on the public debt, operating expenses of most federal agencies, and some entitlements and grants to state and local governments.

ineffective programs, more sharply defining the federal role in relation to state and local roles, and modernizing relevant programs.⁴

Given these concerns, my testimony today addresses (1) how states use their HBP funds and select specific bridge projects for funding, (2) what available data indicate about national trends in bridge conditions and the impact of the HBP, and (3) the extent to which the HBP aligns with principles we developed to guide the re-examination of surface transportation programs. Additionally, I am providing a perspective on related sections of the proposed bridge legislation under review by this committee (S.3338). My testimony is based on a report that we are releasing today.⁵

To determine how state transportation departments use their HBP funds and select specific bridge projects for funding, we visited six states—California, Missouri, New York, Pennsylvania, Texas, and Washington—where we interviewed federal, state, and local transportation officials, including bridge owners and inspectors. We selected these states because they have relatively high levels of federal bridge funding, large bridge inventories, and large inventories of bridges eligible for replacement or rehabilitation. To determine what available data indicate about trends in the condition of the nation’s bridges and the impact of the HBP, we analyzed data in FHWA’s National Bridge Inventory (NBI)—the primary source of information on the nation’s bridges—which contains information on each bridge’s location, size, age, condition, inspection dates, and other information; reviewed relevant legislation and program documents; and interviewed federal, state, and local transportation officials. To determine the extent to which the HBP aligns with our principles for re-examining federal programs, we compared HBP practices to the four key principles we identified in our previous work, including identifying clear federal goals and roles, incorporating performance and accountability into funding decisions, using best tools and approaches,

⁴GAO, *Surface Transportation: Restructured Federal Approach Needed for More Focused, Performance-Based, and Sustainable Programs*, [GAO-08-400](#) (Washington, D.C.: Mar. 6, 2008).

⁵GAO, *Highway Bridge Program: Clearer Goals and Performance Measures Needed for a More Focused and Sustainable Program*, [GAO-08-1043](#) (Washington, D.C.: Sept. 10, 2008).

and ensuring fiscal sustainability.⁶ We conducted our review from October 2007 through September 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained meets these standards.

Summary

The HBP affords states discretion to use HBP funds and select bridge projects in a variety of ways. Some states are focused on reducing their number of deficient bridges,⁷ while other states are pursuing different bridge priorities. For example, California has focused on seismically retrofitting bridges, a safety concern for that state. In addition, some states transfer a portion of their HBP funds to other transportation priorities as allowed by the program, though some of these transferred HBP funds may still be spent on bridges, as well as other work on roadways. Furthermore, some states have also developed tools and approaches for selecting potential bridge projects that go beyond those required by the HBP—such as bridge management systems, highly detailed inspections of bridge elements, state-specific bridge condition ratings, and various prioritization processes—to help them better gauge bridge conditions and further inform their selection of bridge projects for funding. For example, all six states we visited have adopted, or are considering, some form of bridge management system to help them manage their bridge assets and more efficiently allocate their HBP and other bridge funds among competing bridge priorities.

⁶These principles were developed in our earlier work on 21st century challenges and were based on our institutional knowledge, our extensive program evaluation and performance assessment work for the Congress, and federal laws and regulations. See GAO, *21st Century Challenges: Re-examining the Base of the Federal Government*, [GAO-05-325SP](#) (Washington, D.C.: Feb. 1, 2005) and GAO, *High Risk Series: An Update*, [GAO-07-310](#) (Washington, D.C.: Jan. 31, 2007).

⁷The HBP classifies bridge conditions as deficient or not. Deficient bridges include those that are structurally deficient, with one or more components in poor condition, and those that are functionally obsolete, with a poor configuration or design that may no longer be adequate for the traffic they serve.

Bridge conditions, as measured by the number of deficient bridges and the average sufficiency rating of all bridges in the NBI,⁸ improved from 1998 through 2007. For example, the number of structurally deficient bridges decreased by 22 percent from 1998 through 2007, from 93,118 to 73,519 bridges nationwide. The average sufficiency rating of all bridges also improved slightly during that period, with the improvements most notable in bridges owned by local agencies and on rural routes. However, the impact of the HBP on that improvement is difficult to determine, in part, because (1) the program provides only a share of what state and local governments spend on bridges and there are no comprehensive data for state and local spending on bridges and (2) HBP funds can, in some cases, be used for a variety of bridge projects without regard to a bridge's deficiency status or sufficiency rating.

The HBP does not fully align with the re-examination principles that we previously identified in our work in that the program lacks focus on federal or national interests, performance measures, and sustainability. For example, the program's goals—which are established in federal statute⁹—are not focused on a clearly identified federal interest. Rather, the goals have expanded from improving deficient bridges to supporting seismic retrofitting, preventive maintenance, and many other projects, thus expanding the federal interest to potentially include almost any bridge in the country. In addition, the HBP lacks measures linking funding to performance, and it is not sustainable, given the anticipated deterioration of the nation's bridges and the declining purchasing power of funding currently available for bridge maintenance, rehabilitation, and replacement. Once the federal interest in bridges is clearly defined, policymakers can clarify the goals for federal involvement and align the program to achieve those goals. HBP sustainability may also be improved by identifying and developing performance measures and re-examining funding mechanisms. In our report released today, we recommend that DOT work with Congress to improve the focus, performance, and sustainability of the HBP by defining specific national goals, establishing and implementing performance measures, evaluating best tools and practices, and evaluating HBP's funding mechanisms to better support a targeted and sustainable program. In commenting on a draft of the report,

⁸In addition to classifying bridges as deficient or not, the HBP also assigns each bridge a sufficiency rating reflecting its structural adequacy, safety, serviceability, and relative importance, and it uses this information in distributing HBP funding to the states.

⁹See 23 U.S.C. § 144.

DOT officials said that they generally agreed with our findings and recommendations, and they provided technical clarifications which we incorporated in the report and this testimony, as appropriate. DOT officials also commented that our re-examination principles had broader applicability than the HBP—noting that they had incorporated the principles into the Department’s recent proposal for reforming surface transportation programs.

Finally, our work on the HBP has implications for several provisions of the proposed legislation under review by this committee, the National Highway Bridge Reconstruction and Inspection Act of 2008 (S.3338). In particular, the results of our work are consistent with the overall provisions calling for the establishment of a risk-based prioritization process for selecting bridge projects, 5-year performance plans, and bridge management systems. Our work does raise some questions about the scope of these activities, particularly the legislation’s focus on all deficient bridges, because all deficient bridges are not necessarily unsafe, according to many of the state transportation officials we interviewed.

Background

Bridge safety first emerged as a high-priority issue in the United States in the 1960s, following the collapse of the Silver Bridge between Ohio and West Virginia, which killed 46 people. That collapse prompted national concerns about bridge conditions and safety and highlighted the need to repair and replace bridges before they collapse. Congress responded by establishing two major federal bridge programs: (1) the National Bridge Inspection Program (NBIP) to ensure periodic safety inspection of bridges and (2) what is now known as the HBP to provide a funding mechanism to assist states in replacing and rehabilitating bridges. Both of these programs generally define applicable bridges as publicly owned, over 20 feet in length, and located on public roads. Although the NBIP and HBP are separate programs, they are linked by the data collected through bridge inspections. For example, bridge information gathered through NBIP inspections is one factor used to determine the amount of HBP funding apportioned to states.

The NBIP establishes federal standards, known as the National Bridge Inspection Standards, and program requirements for the proper safety inspection and evaluation of bridges. These standards establish by whom, with what frequency, and how bridge inspections are to be completed. For example, state departments of transportation (DOTs) carry out the federal-level policies, procedures, and requirements for inventory, inspection, bridge load ratings, quality assurance, and reports. Routine bridge

inspections are generally conducted every 2 years, but with FHWA approval, the inspection interval may be extended to 4 years on certain bridges. Bridges may be inspected more often than every 2 years, when past inspection findings justify an increased inspection frequency. Bridge inspectors must record bridge data, including bridge conditions, during the inspection and report that information to the NBI, maintained by FHWA headquarters.

Based on information gathered during bridge inspections and reported to the NBI, the HBP classifies bridge conditions as deficient or not; assigns each bridge a sufficiency rating reflecting its structural adequacy, safety, serviceability, and relative importance; and uses that information to provide funding for states to improve bridges. Deficient bridges include those that are structurally deficient, with one or more components in poor condition, and those that are functionally obsolete, with a poor configuration or design that may no longer be adequate for the traffic they serve. FHWA uses information in the NBI to annually apportion HBP funds to the states. While each state's HBP apportionment amount is largely determined by bridge conditions and bridges generally must be below a certain condition threshold to qualify for HBP funding, other bridges are also eligible for HBP funds because states may use the funds for a broad array of other purposes, such as bridge preventive maintenance projects.

All bridges are grouped into one of two general categories: Federal-aid highway bridges and bridges not on Federal-aid highways. The NBIP and the HBP generally apply to both categories of bridges located on public roads.¹⁰ Federal-aid highway bridges are generally located on the National Highway System, a 160,000-mile network that carries over 40 percent of the nation's highway traffic.¹¹ Non-Federal-aid highway bridges are generally located on local or rural roads that carry lower volumes of traffic than state-owned bridges.

¹⁰The NBIP standards do not apply to pedestrian or railroad bridges, bridges on private roads, or tunnels. FHWA encourages states to require private organizations to inspect privately owned bridges according to those standards. States are not responsible for the inspection of bridges owned by federal agencies.

¹¹The National Highway System (NHS) is made up of five components, including (1) the Interstate System, (2) selected other principal arterials, (3) the Strategic Highway Network, (4) Major Strategic Highway Network connectors, and (5) intermodal connectors that provide access between major intermodal passenger and freight facilities and other NHS components.

State DOTs Exercise Discretion in Determining How to Use HBP Funds and Select Bridge Projects for Funding

The HBP affords state DOTs discretion in determining how to use their HBP funds, and as a result, states use HBP funds and select bridge projects in a variety of ways. The HBP gives states three key flexibilities in determining how to use their HBP resources. First, the HBP has evolved to allow states to use program funds not only for bridge replacement and rehabilitation, but also for a broad array of purposes—including painting, seismic retrofitting, systematic preventive maintenance, installation of scour countermeasures (to address the effects of sediment erosion around bridge piers and abutments), and anti-icing or deicing applications—regardless of the bridge’s condition. In addition, FHWA has determined that the costs for personnel and equipment used in bridge inspections and for bridge management systems are consistent with the purpose of the HBP and therefore are also eligible uses for HBP funds. Thus, states have the flexibility to use HBP funds on bridge projects that may not immediately reduce their inventory of deficient bridges. Secondly, states have flexibility in determining how to split HBP resources between state and locally owned bridges. Aside from a requirement to distribute funds equitably, the only HBP requirement applicable to states’ allocation of program funds is that states must spend a minimum (15 percent) on non-Federal-aid highway bridges. Third, states may also spend program funds on other, nonbridge, transportation priorities by transferring up to 50 percent of their annual HBP funding to other core Federal-aid highway programs,¹² though a penalty is invoked by reducing the state’s HBP funds in the succeeding year by the amount transferred. Many states have taken advantage of this provision over the years and transferred some of their HBP funding to other programs, although FHWA officials pointed out that some of the transferred HBP funds may still be spent on bridges and funds from other Federal-aid highway programs may also be spent on bridges. FHWA data show that significant funds have flowed toward bridges from other programs which, from a national perspective, exceed outflows from the HBP. Finally, planning for how HBP funds are spent is generally under the control of state DOTs; once states select bridge projects, they may apply to FHWA for the federal share of the costs, which is generally 80 percent of the project cost.¹³

¹²The majority of Federal-aid highway infrastructure funding is distributed through seven major programs, often referred to as core highway programs. These programs are the National Highway System Program, Surface Transportation Program, Interstate Maintenance Program, HBP, Congestion Mitigation and Air Quality Improvement Program, Highway Safety Improvement Program, and the Equity Bonus Program.

¹³The federal share for bridge projects on the Interstate System is 90 percent.

In part due to these flexibilities, state DOTs we visited have established a range of priorities for their HBP funds—from reducing the number of their deficient bridges to seismically retrofitting their bridges—and some opted to transfer their HBP funds to fund other transportation priorities. Although the key purpose of the HBP is to enable states to improve the condition of their deficient bridges, some state transportation officials we interviewed explained that they do not focus on reducing their inventories of deficient bridges for several reasons:

- *Deficient bridges are not necessarily unsafe.* Many state transportation officials we interviewed told us that some of the deficient bridges in their states are in at least reasonably good condition and are safe. In addition, FHWA reported in 2007 that classifying a bridge as deficient does not immediately imply that it is likely to collapse or that it is unsafe.¹⁴ According to the FHWA report, if proper vehicle weight restrictions are posted and enforced, deficient bridges can continue to serve most traffic conditions. FHWA requires that bridge owners close to traffic any bridges that they determine to be unsafe.
- *The HBP apportionment formula may create a disincentive to improve deficient bridges.* Many federal and state officials we met with noted this potential disincentive that occurs because reducing the number and deck area of deficient bridges reduces a state’s HBP funding eligibility.¹⁵
- *Some deficient bridge projects can be cost-prohibitive.* Some state officials explained that certain large-scale bridge projects—often the most traveled, urban bridges on interstate corridors—are too expensive to be implemented with HBP funds alone, especially costly “mega” projects that have an estimated total cost greater than \$500 million.

State DOTs use a variety of criteria, tools, and methods to select among potential bridge projects. Officials in the six states we visited use criteria such as bridge condition ratings, average daily traffic over bridges, local transportation priorities, or funding availability when prioritizing and selecting among potential bridge projects. Some states have also

¹⁴DOT, *2006 Status of the Nation’s Highways, Bridges, and Transit: Conditions and Performance* (Washington, D.C.: Jan. 22, 2007).

¹⁵FHWA apportions, or divides, the annually authorized HBP funds among the states according to a statutory apportionment process that considers a number of factors, including a state’s total deficient bridge deck area. Therefore, reducing the number and total deck area of deficient bridges reduces a state’s HBP funding eligibility.

developed tools and approaches beyond those required by the HBP—such as bridge management systems, element-level inspections, state-specific condition ratings, and various prioritization approaches—to help them gauge bridge conditions and further inform their selection of bridge projects for funding. For example, all of the states we visited have adopted, or are considering, some form of bridge management system for gathering and analyzing bridge data to help manage their bridge assets and more efficiently allocate limited HBP resources among competing bridge priorities. States use these systems to predict future bridge conditions, estimate bridge maintenance and improvement needs, determine optimal policies for rehabilitation and replacement, and recommend projects and schedules within budget and policy constraints. FHWA has actively encouraged, but has not required, states to use bridge management systems, in part, by providing state transportation officials with relevant training and technical support.¹⁶ In addition, all of the states we visited required bridge inspectors to gather more detailed “element-level” bridge condition data, thereby exceeding the federal inspection requirements that require inspection of only the three major bridge components (superstructure, substructure, and deck).¹⁷ Furthermore, some state DOTs use their own bridge rating systems to better gauge bridge conditions and to inform their selection of bridge projects for funding. For example, the New York State DOT uses its own condition rating scale, which is based on an assessment of 47 individual bridge elements, to prioritize bridge projects. Finally, state DOTs use different methods to prioritize and select bridge projects for funding. Whereas some states we visited had highly centralized prioritization processes, others allowed the process to vary across the state.

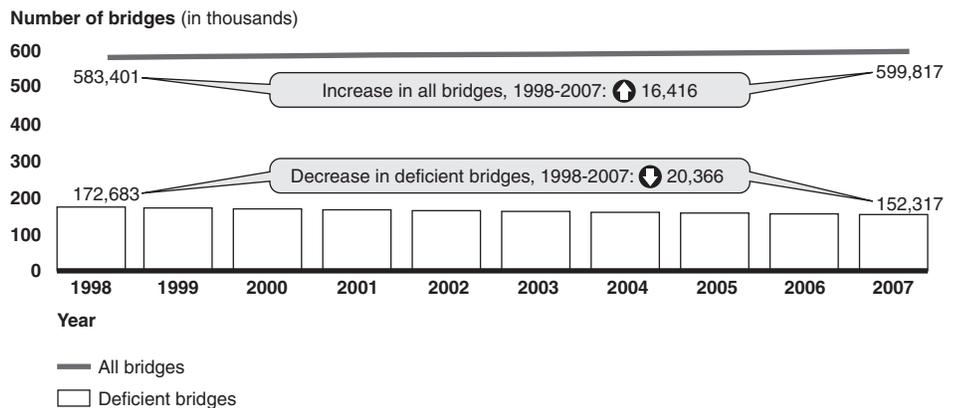
¹⁶There is currently no federal requirement that states use a bridge management system. The Intermodal Surface Transportation Efficiency Act of 1991 introduced a requirement that states implement bridge management systems by December 1993, but this requirement was repealed by the National Highway System Designation Act of 1995.

¹⁷The superstructure is the portion of a bridge’s structure that spans the obstacle the bridge is intended to cross (e.g., a waterway). The substructure consists of all parts that support the superstructure.

Available Data Indicate That the Overall Condition of the Nation's Bridges Has Improved, but the Impact of the HBP Is Difficult to Determine

Bridge conditions, as measured by the number of deficient bridges and average sufficiency rating, improved from 1998 through 2007. According to NBI data, the total number of deficient bridges—including both structurally deficient and functionally obsolete bridges—has decreased over the last 10 years, even as the total number of bridges has increased. From 1998 through 2007, the number of deficient bridges declined by nearly 12 percent, from 172,683 to 152,317, even with the addition of more than 16,000 new bridges to the NBI (see fig. 1).

Figure 1: Trends in Numbers of Bridges and Deficient Bridges, 1998 through 2007

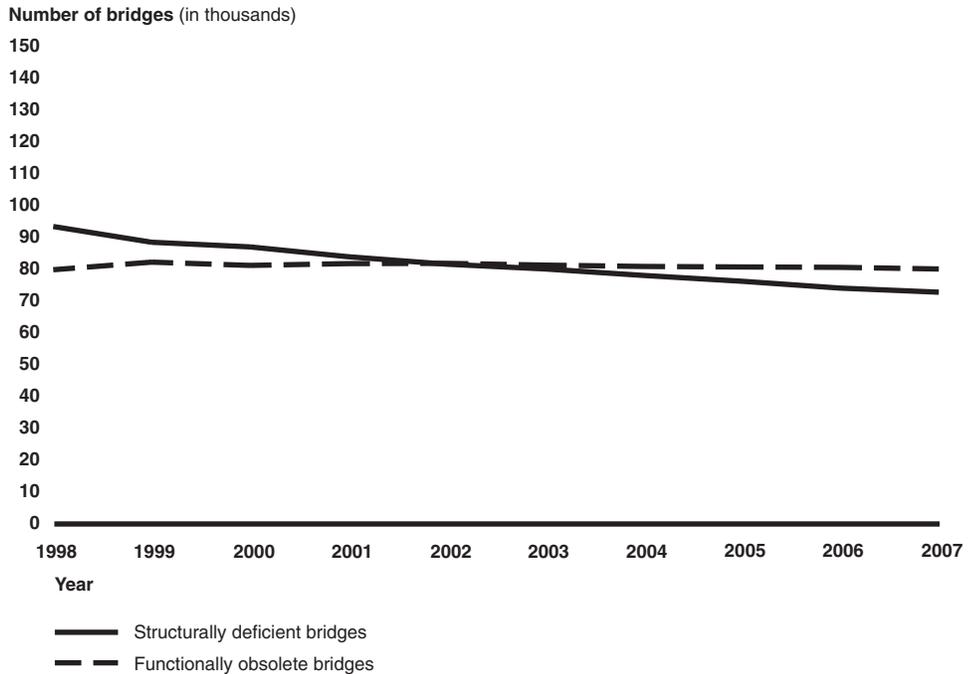


Source: GAO analysis of FHWA data.

Note: Deficient bridges include both structurally deficient and functionally obsolete bridges.

The decline in the overall number of deficient bridges over the past decade reflects a reduction in the number of structurally deficient bridges. From 1998 through 2007, the number of structurally deficient bridges decreased by 22 percent, from 93,118 to 72,519 (see fig. 2). During that same period, the number of functionally obsolete bridges increased slightly from 79,565 to 79,798, an increase of 233 bridges. The reduction in the number of structurally deficient bridges, rather than functionally obsolete bridges, over this time period may reflect bridge owners' efforts to address the deterioration or damage that are characteristic of structurally deficient bridges. Although reducing or eliminating structurally deficient bridges may not always be a state's highest priority, structurally deficient bridges often require maintenance and repair to remain in service. By contrast, functionally obsolete bridges do not necessarily require repair to remain in service and, therefore, are unlikely to be transportation officials' top priority for rehabilitation or replacement.

Figure 2: Number of Structurally Deficient and Functionally Obsolete Bridges, 1998 through 2007



Source: GAO analysis of FHWA data.

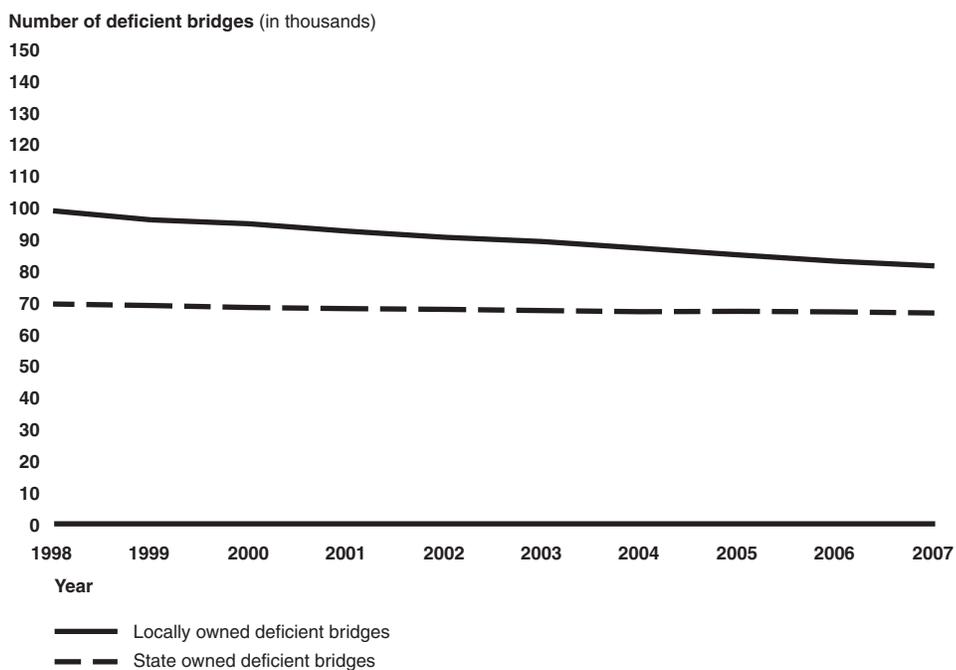
The average sufficiency rating of all bridges—including both deficient and not deficient bridges—also improved slightly between 1998 and 2007, from 75 to 79 on the sufficiency rating’s 100-point scale.¹⁸ Additionally, while structurally deficient bridges generally have lower sufficiency ratings (average rating of 42 in 2007) than functionally obsolete bridges (average rating of 69 in 2007), the average sufficiency ratings of both types of deficient bridges improved slightly over the last decade.

Improvements were most notable in bridges owned by local agencies and on rural routes, which may be attributable, in part, to the federal bridge program requirement—under HBP and some of its predecessor programs—that states spend a minimum amount of their apportionment

¹⁸The sufficiency rating is a score from 0 to 100 assigned to each bridge, reflecting its structural adequacy, safety, serviceability, and essentiality or relative importance for public use. A rating of 100 represents an entirely sufficient bridge and a 0 represents an entirely insufficient bridge.

on non-Federal-aid highway bridges.¹⁹ For example, from 1998 through 2007, the average sufficiency rating for bridges owned by local agencies improved from 71 to 77, and the number of deficient bridges decreased by over 17 percent, from 99,492 to 82,101. During that same period, for bridges owned by state agencies, the average sufficiency rating improved from 79 to 82, and the number of deficient bridges decreased by 4 percent, from 70,066 to 67,232 (see fig. 3).

Figure 3: Number of Deficient Bridges, by Bridge Owner, 1998 through 2007



Source: GAO analysis of FHWA data.

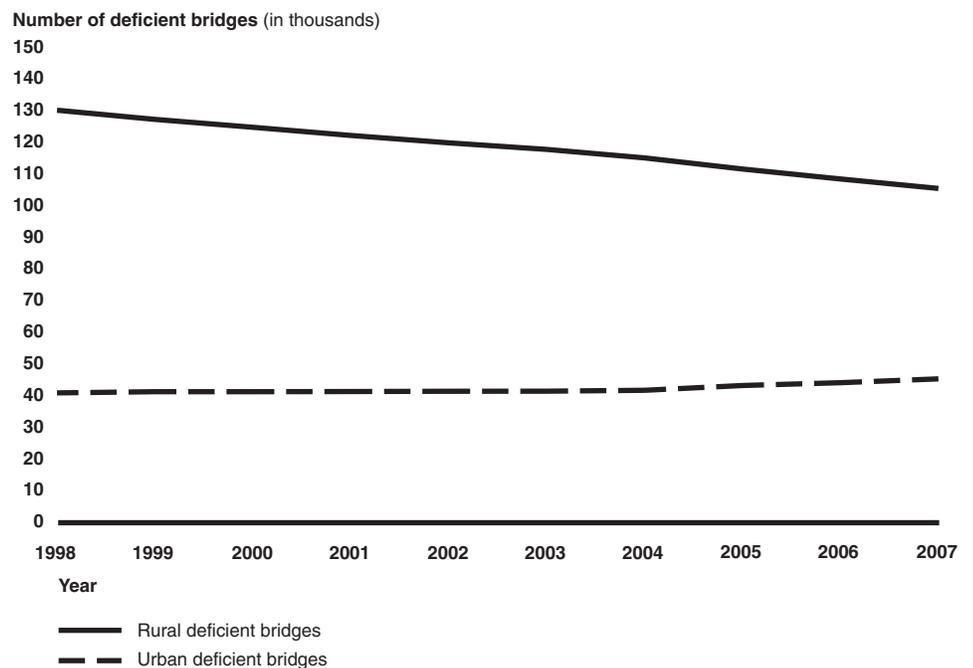
Note: Deficient bridges include both structurally deficient and functionally obsolete bridges.

With respect to urban and rural bridges, the number of deficient rural bridges declined from 1998 through 2007 and the number of deficient

¹⁹Since 1978, a minimum of each state’s apportionment has to be spent on bridges that are off the Federal-aid highway system. Until the enactment of the 2005 surface transportation authorizing legislation, there was also a maximum ceiling, 35 percent, that could be spent on non-Federal-aid highway bridges.

urban bridges increased.²⁰ From 1998 through 2007, the number of deficient rural bridges decreased by about 19 percent, from 130,910 to 106,209.²¹ During that same period, the number of deficient urban bridges increased by about 11 percent, from 41,659 to 46,086 (see fig. 4). The average sufficiency rating for both rural and urban bridges improved slightly from 1998 through 2007; for rural bridges, the average rating increased from 74 to 78, and for urban bridges, the average rating increased from 79 to 82.

Figure 4: Number of Deficient Bridges, by Rural and Urban Classification, 1998 through 2007



Source: GAO analysis of FHWA data.

Note: Deficient bridges include both structurally deficient and functionally obsolete bridges.

The impact of the HBP on the improvements in bridge conditions is difficult to determine for several reasons, including lack of information on

²⁰ A bridge is classified as rural in the NBI database if it is not located inside a designated urban area.

²¹ Approximately 75 percent of the nation's bridges are rural, and 25 percent are urban.

state and local bridge spending, the expansion of bridge project eligibility, and limitations in the NBI data. First, the impact of the federal investment in the HBP is difficult to measure in part because there are no comprehensive data for state and local spending on bridges. FHWA does track a portion of each state's capital spending on bridges, and the agency has generated a single, national level estimate for total bridge expenditures by all government levels; however, there are significant gaps in this information, and neither source is comprehensive or detailed enough to be used to determine the impact of the HBP.²² The state transportation officials we spoke with during our site visits estimated that state and local spending on bridges ranged from the minimum match amount (generally 20 percent of the HBP apportionment amount) to more than four times the state's apportioned HBP funds. Our previous work has shown that although federal investment in HBP and other Federal-aid highway programs has increased over time, this investment has not resulted in commensurate increases in the nation's total government spending (federal, state, and local) on its highway system.²³ In particular, as the level of federal funding has increased since the mid-1990s, states have not maintained their level of effort in highway spending, and federal funds have increasingly been substituted for state funds. This suggests that increased federal highway funding influences states and localities to substitute federal funds for state and local funds they otherwise would have spent on highways and bridges.

Second, the impact of the HBP is also difficult to measure because HBP funds can, in some cases, be used for a variety of bridge projects without regard to a bridge's deficiency status or sufficiency rating. Therefore, simply measuring changes in the number of structurally deficient or functionally obsolete bridges does not reflect the full impact of the program since these measures do not capture the impact of the HBP investment in the other eligible activities that do not necessarily result in

²²For example, while FHWA does track a portion of bridge capital spending on a state by state basis, the data does not include (1) state spending on bridges located on local roads and (2) most local government spending on bridges. In addition, while FHWA generates a single, national-level estimate for total bridge expenditures at all government levels, this estimate cannot be used to determine the impact of the HBP by state or by bridge because it is a national aggregate. Moreover, neither of these two FHWA data sources on bridge spending includes noncapital activities funding by the HBP, such as systematic preventive maintenance, anti-icing and deicing applications, and painting.

²³GAO, *Federal-Aid Highways: Trends, Effect on State Spending, and Options For Future Program Design*, [GAO-04-802](#) (Washington, D.C.: Aug. 31, 2004).

an immediate reduction in the number of deficient bridges. Without quantifiable performance measures to track the full range of desired outcomes for the HBP, it is difficult to measure the program's impact and determine the extent to which the program is serving its stated purpose.

Finally, another difficulty in determining the impact of HBP funding occurs because the NBI does not readily permit changes in the condition of a group of bridges to be tracked across time. Each bridge in the NBI is assigned an identifying number by the relevant state DOT. However, the identifying number for a bridge at a specific location may change over the life of that bridge. Such a change may occur when a state renumbers, replaces, or closes and subsequently reopens a bridge. As a result, it is difficult to track changes in the condition of any specific bridge or group of bridges to determine if, for example, the same bridges that were deficient in 1998 are still deficient today, to see how many bridges have been replaced, or to determine the impact of new bridges added to the inventory (which may not be funded by the HBP) on the overall condition of the nation's bridges.

Evaluating the impact of the HBP is important not only to understand the outcomes of past spending but also to determine how to sensibly invest future federal resources. The number of HBP-eligible bridges is expected to increase as a large share of the nation's bridges built in the 1960s and early 1970s age and become eligible for rehabilitation and replacement as a group; as a result, states and local agencies may see a spike in their need for bridge rehabilitation and replacement funding. In this environment of increasing demand for limited resources, it is especially important for FHWA and Congress to be able to evaluate the impact of the HBP in order to ensure that the program is providing an acceptable return on investment and addressing national transportation priorities.

The HBP Lacks Focus, Performance Measures, and Sustainability

The HBP, while generally helping to improve bridge conditions, does not fully align with our principles for re-examining surface transportation programs in that the bridge program lacks focus, performance measures, and sustainability. Our principles, which are based on our prior work and federal laws and regulations, include: (1) ensuring program goals are well defined and focused on the federal or national interest, (2) incorporating performance and accountability into funding decisions, (3) employing the best tools and approaches to emphasize return on targeted federal investment, and (4) ensuring fiscal sustainability.

First, HBP's goals are not focused on a clearly identified federal interest. Over the years, the program's statutory goals have expanded from improving deficient bridges to supporting seismic retrofitting, preventive maintenance, and many other activities, thus expanding the federal interest to potentially include almost any bridge in the country. Our previous work has emphasized the importance of identifying clear areas of federal interest as a first step in determining program goals. For example, if mobility is determined to be a key federal interest and a primary goal, the HBP could be targeted toward bridges whose conditions have the most impact on congestion and economic competitiveness and that carry higher levels of traffic or freight than those bridges in remote areas that may serve only a few people each day. If rehabilitating and reducing deficient bridges is determined to be a key federal interest, then the program could be further targeted toward that goal. The federal interest may also be greater in bridge projects that are too expensive for states to undertake without additional federal assistance or in projects that extend beyond the borders of a single state. Once the federal interest has been determined, our principles call for basing the federal share of the cost of bridge projects on the level of federal interest.

Second, there is no clear tie between HBP funding and performance. HBP funds are apportioned to states without regard to program performance because the HBP formula is based on a calculation of needed repairs to deficient bridges but does not consider a state's efforts or effectiveness in reducing its inventory of deficient bridges or controlling costs. Because the formula does not factor in other eligible program activities, such as systematic preventive maintenance, there is no link between the apportionment formula and the states' performance of these activities. Without performance measures to link funding to performance, states lack an incentive to improve the return on the federal investment and are not held accountable for the results of their investments. Our work has shown that an increased focus on performance and accountability for results can help the federal government better target limited federal resources.

Third, the HBP generally lacks sufficient tools to determine the effects of the federal investment in bridges. In this regard, bridge management systems, which are currently used by many states but not required by the program's authorizing legislation, may be useful for prioritizing projects and making funding decisions to improve results and emphasize return on investment.

Finally, the HBP's fiscal sustainability remains a challenge in light of aging bridge infrastructure, coupled with the declining purchasing power of

funding currently available for bridge maintenance, rehabilitation, replacement and the recent growth in construction costs. Based on our prior work, two tools that could possibly improve the sustainability of the HBP are a maintenance-of-effort requirement and tolling. A maintenance-of-effort requirement, whereby state or local grantees would be required to maintain their own level of funding in order to receive HBP funds, could reduce the potential substitution of federal funds for state and local funds under the program. In addition, our prior work has shown that removing barriers to, or even promoting, tolling can lead to more efficient management of existing infrastructure and capacity.²⁴ Addressing the HBP's future fiscal sustainability is critical, given the overall fiscal imbalance facing the nation and the lack of assurance that HBP funding is allocated to projects that are in the federal interest and provide the best return on investment.

Observations on Proposed Bridge Legislation

Our work on the HBP can provide some perspective on several provisions in the proposed legislation under review by this committee, the National Highway Bridge Reconstruction and Inspection Act of 2008 (S. 3338). The legislation proposes, among other things, to authorize an additional \$1 billion for fiscal year 2009 from the U.S. Treasury's general fund to address bridge infrastructure. The legislation would also require DOT to strengthen bridge inspection standards, adopt a risk-based process for prioritizing certain bridge rehabilitation and replacement projects, and require that states develop 5-year performance plans for bridge inspections and for the rehabilitation or replacement of deficient bridges.

As summarized below, our work on the HBP is related to several provisions in the proposal:

- For example, the legislation calls for DOT to apply a risk-based prioritization process to every structurally deficient or functionally obsolete bridge in the nation. While such a process could potentially help target scarce federal resources to bridges that are most critical to safety and mobility, many state transportation officials we interviewed during our work raised questions about the appropriateness of focusing on all deficient bridges, noting that all deficient bridges are not necessarily unsafe and some large-scale deficient bridge projects can be too cost-prohibitive to be implemented with HBP funds alone. Also, the legislation

²⁴GAO, *Highway Finance: States' Expanding Use of Tolling Illustrates Diverse Challenges and Strategies*, [GAO-06-554](#) (Washington, D.C.: June 28, 2006).

is unclear about how, if at all, the new risk-based prioritization process will differ from or relate to DOT's established sufficiency rating process. FHWA uses sufficiency ratings primarily to determine HBP eligibility and apportion funds. We found that states may consider sufficiency ratings in their prioritization processes but generally do not rely on these to prioritize bridge projects.

- In addition, the legislation calls for DOT to require states to develop 5-year performance plans covering the inspection and rehabilitation or replacement of all structurally deficient or functionally obsolete bridges. We support the use of performance plans to articulate program goals that are in the federal interest, encourage accountability for results, and help ensure that the federal government targets resources to programs that best achieve intended outcomes and national priorities. Our work has shown that the current HBP funding formula is not linked to a state's performance in reducing its inventories of deficient bridges and we are recommending in our report being issued today that DOT work with Congress to define specific national goals and performance measures for the HBP. This legislative provision might be strengthened by requiring states to report on their progress in achieving their goals as part of each annual update to their performance plan. Also, the legislation requires that the performance plans be focused on all deficient bridges, and the same issue that I raised earlier about the appropriateness of this focus applies here as well.
- The legislation also calls for DOT to require the states to develop and implement a bridge management system. In our work on the HBP, all six states we visited had adopted, or were considering, some form of bridge management system to help manage their bridge assets and more efficiently allocate limited HBP resources among competing bridge priorities. In the report we are releasing today, we are recommending that DOT evaluate and incorporate into the HBP best tools and practices, such as bridge management systems.

Conclusions and Recommendations

Although many aspects of the HBP are carried out at the state level—with ultimate responsibility for bridge inspection and project selection residing with the states—the federal government bears responsibility for ensuring that the program achieves results that are in the federal interest and that the program's resources are allocated efficiently. The purpose of the HBP has greatly expanded over the years, making nearly any bridge potentially eligible for federal funding, and as a result, the federal interest in bridges lacks focus. Additionally, many state officials told us that measures used by the HBP to apportion federal funds—bridge deficiency status and

sufficiency ratings—are not necessarily good proxies for the safety or risk associated with specific bridges. Even though data indicate that the number of structurally deficient bridges has declined over the last 10 years, most of this improvement has been in locally owned and rural bridges. Oftentimes, the largest and most critical bridges carrying more interstate commerce are too expensive to be funded by the HBP and so require other funding sources to be replaced or rehabilitated. Moreover, without comprehensive data on state and local spending on bridges, it is impossible either to distinguish the impact of HBP funding from the impact of state and local bridge funding or to determine the extent to which states are substituting HBP funding for state and local funds that would otherwise have been spent on bridges. Absent clear goals and related performance measures for the HBP, it is difficult to determine the overall effectiveness of the program’s investment in bridges.

Our principles have suggested several ways to improve the HBP to ensure that it is more focused and performance-based in the future. For example, tools such as bridge management systems provide bridge managers with a more systematic approach to prioritizing projects and making funding decisions. Our work has shown that some states are using bridge management systems and other tools that generally exceed federal standards. Additionally, linking program goals to performance measures to determine whether goals are met and using that information to select projects and make funding decisions, can create incentives for state and local governments to improve the performance of their bridge programs, as well as the overall transportation system. As the projected revenue shortfall in the Highway Trust fund rapidly approaches and as bridge costs rise and infrastructure continues to age, incorporating strategies to better ensure the fiscal sustainability of the HBP is also critical.

To improve the focus, performance, and sustainability of the HBP, the report we are releasing at this hearing recommends that the Secretary of Transportation work with Congress to take the following actions:

- identify and define specific national goals for the HBP;
- determine the performance of the program by developing and implementing performance measures related to the goals for the HBP;
- identify and evaluate best tools and practices that can potentially be incorporated into the HBP, such as bridge management systems; and

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- review and evaluate HBP funding mechanisms to align funding with performance and support a targeted and sustainable federal bridge program.

In reviewing a draft of the report, DOT officials said that they generally agreed with our findings and recommendations, and they provided technical comments which we incorporated in the report and this testimony, as appropriate. DOT officials also commented that they thought our re-examination principles had broader applicability than just the HBP—noting that DOT had incorporated our principles into the Department’s recent proposal for reforming surface transportation programs. DOT’s reform proposal, released in July 2008, recommends consolidating the existing network of over 100 surface transportation programs into eight broad, intermodal programs.²⁵ The officials noted that DOT’s reform proposal articulates a narrower federal interest and a framework for performance management tied to clearer goals for surface transportation programs. We have not commented on DOT’s reform proposal, and the outcome of that proposal in the surface transportation reauthorization debate that will occur during 2009 is uncertain. However, we agree with DOT that our re-examination principles are applicable at a broader level than a specific program like HBP; in fact, we developed our principles because of (1) our concerns, raised in prior work, that many federal surface transportation programs are not effective at addressing key transportation challenges such as growing congestion and freight demand and (2) our conclusion that our principles could help drive the re-examination of those programs and help assess options for restructuring the entire federal surface transportation program.²⁶

Chairman Boxer, this concludes my prepared statement. I would be happy to respond to any questions that you or members of the committee may have.

²⁵DOT, *Refocus, Reform, Renew: A New Transportation Approach for America* (Washington, D.C.: July 29, 2008).

²⁶See [GAO-08-400](#).

GAO Contact and Staff Acknowledgments

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