

**ASSESSMENT OF FHWA OVERSIGHT OF  
THE HIGHWAY BRIDGE PROGRAM AND  
THE NATIONAL BRIDGE INSPECTION  
PROGRAM**

*Federal Highway Administration*

*Report Number: MH-2010-039*

*Date Issued: January 14, 2010*



# Memorandum

**U.S. Department of  
Transportation**

Office of the Secretary  
of Transportation  
Office of Inspector General

Subject: **ACTION:** Assessment of FHWA Oversight of the  
Highway Bridge Program and the National Bridge  
Inspection Program  
Federal Highway Administration  
Report Number: MH-2010-039

Date: January 14, 2010

From: Joseph W. Comé   
Assistant Inspector General  
for Surface and Maritime Program Audits

Reply to  
Attn. of: JA-40

To: Federal Highway Administrator

This report presents the results of our assessment of the Federal Highway Administration's (FHWA) oversight of the Highway Bridge Program (HBP) and the National Bridge Inspection Program (NBIP), and FHWA's efforts to monitor states' use of Federal-aid for bridges. While some progress has been made in recent years to reduce the number of deficient bridges, maximizing Federal surface transportation investments to improve current bridge conditions is a major challenge for FHWA. According to the American Association of State Highway and Transportation Officials (AASHTO), the average bridge in the United States is 43 years old and, according to FHWA, about one in four of the Nation's more than 600,000 bridges are deficient. FHWA has estimated that as much as \$65 billion would be needed to address current bridge deficiencies and other needed improvements.<sup>1</sup> The collapse of the Interstate 35W (I-35W) Bridge in Minneapolis, Minnesota, on August 1, 2007, killing 13 people, underscored the importance of strong bridge safety programs and the need to maximize investments to improve bridge conditions. With the enactment of the American Recovery and Reinvestment Act (ARRA) of 2009<sup>2</sup> comes an unprecedented opportunity to fund \$27.5 billion worth of highway infrastructure projects, including those related to bridges.

<sup>1</sup> This estimate is based on 2004 data and reported in constant 2004 dollars.

<sup>2</sup> Pub. L. No. 111-5 (2009).

Our objectives were to assess FHWA's: (1) oversight of Federal-aid funds provided to states through the HBP for deficient bridges and (2) enforcement of bridge inspection standards under the NBIP. As part of this audit, we also examined how FHWA could better implement data-driven, risk-based bridge oversight, which we addressed in our January 2009 report.<sup>3</sup> To address these objectives, we conducted site visits in Kentucky, Michigan and Pennsylvania and interviewed FHWA officials in 11 Division Offices. We also obtained and analyzed data from the Fiscal Management Information System and National Bridge Inventory databases.

We conducted this performance audit 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 provides a reasonable basis for our findings and conclusions based on our audit objectives. See details on our scope and methodology in exhibit A.

## **RESULTS IN BRIEF**

FHWA lacks sufficient data to evaluate states' use of HBP funds. Specifically, FHWA can not link expenditures of HBP funds to improvements made to deficient bridges. For example, while Michigan is using almost \$3 million in HBP funds on a project that involves preventive maintenance on four deficient and three non-deficient bridges, FHWA's accounting system is unable to determine how much Federal-aid goes toward improving the condition of deficient bridges.

FHWA also lacks the criteria and guidance necessary to determine whether states demonstrate overall compliance with bridge inspection standards under the NBIP. While bridge inspection standards include numerous requirements to ensure bridge safety, FHWA has not defined how the bridge engineers conducting the annual compliance review should assess states' overall compliance and what actions to take when states fail to comply. Consequently, Federal-aid highway funds were provided to states with incidents of noncompliance, including some that could pose serious risks to public safety. For example, based on our analysis of data from FHWA's 2007 annual compliance review, a bridge engineer reported a state to be substantially compliant despite that state's failure to close 96 bridges, as required by the bridge inspection standards.

---

<sup>3</sup> OIG Report Number MH-2009-013, "National Bridge Inspection Program: Assessment of FHWA's Implementation of Data-Driven, Risk-Based Oversight," January 12, 2009. OIG reports and testimonies are available on our website: [www.oig.dot.gov](http://www.oig.dot.gov).

We are making a series of recommendations to FHWA to strengthen its oversight of states' use of HBP funding in improving the conditions of deficient bridges nationwide and the agency's enforcement of state compliance with bridge inspection standards.

## BACKGROUND

The HBP is the primary Federal program that funds the replacement and rehabilitation of bridges nationwide. It classifies bridges according to their condition, based on data collected by state and local governments during inspections of public highway bridges; and using a needs-based formula, it apportions Federal-aid among states to improve bridge conditions. States that demonstrate greater need receive more funding.<sup>4</sup> Each state's HBP apportionment is based largely on the amount of deck area on deficient bridges that qualifies for replacement or rehabilitation. Figure 1 below illustrates the deck area of the new I-35W Bridge built to replace the bridge that collapsed, which was structurally deficient.



A deficient bridge is classified as either structurally deficient or functionally obsolete. A bridge is generally classified as structurally deficient when the bridge deck, superstructure, or substructure is in poor or worse condition.<sup>5</sup> A bridge is generally classified as functionally obsolete when the geometry of the bridge is no longer suitable for the traffic it serves.<sup>6</sup> Being designated as deficient does not

<sup>4</sup> The needs-based formula apportions a maximum of 10 percent and a minimum of 0.25 percent of the total HBP apportionment to each state for any one fiscal year.

<sup>5</sup> The deck, superstructure, and substructure represent the three components of a bridge. The deck directly carries traffic. The superstructure supports the deck. The substructure uses the ground to support the superstructure.

<sup>6</sup> Factors that affect the geometry of a bridge include the width of the roadway on the bridge, the alignment of the approach roadway, and the clearances for the roadway below the bridge.

imply that a bridge is unsafe. Bridge inspections should identify any unsafe conditions and those bridges determined to be unsafe must be closed.

Congress declared in law that HBP funds be used to improve the condition of deficient bridges through replacement and rehabilitation; but states are also allowed to use HBP funds for other activities, such as systematic preventive maintenance, seismic retrofitting, and scour countermeasures,<sup>7</sup> regardless of a bridge's deficiency status.<sup>8</sup> Furthermore, states may transfer up to 50 percent of their annual HBP funding to other Federal-aid highway programs and spend it on non-bridge projects. According to statute, FHWA is responsible for monitoring the efficient and effective use of Federal-aid highway funds.<sup>9</sup> FHWA states in policy that it will fulfill this responsibility.<sup>10</sup>

FHWA sets standards for states' bridge inspection programs of public highway bridges through the National Bridge Inspection Standards (NBIS) under the NBIP. The NBIS includes requirements regarding the frequency with which states should conduct inspections, the qualifications of inspection personnel, and the data to be collected. The annual NBIS compliance review consists of a field review of bridges, interviews with state bridge staff, and a review of state bridge inspection data. The review is conducted by FHWA Division Office bridge engineers, who work with other Division officials to determine whether states are compliant.<sup>11</sup> To enforce NBIS requirements, FHWA may require a non-compliant state to develop a plan to correct a deficiency and FHWA can ultimately suspend Federal-aid highway funds if a deficiency is not corrected.

In response to our January 2009 report on FHWA's implementation of data-driven, risk-based bridge oversight, FHWA concurred with our recommendation to develop a comprehensive plan to use data to identify and address higher priority bridge safety risks in coordination with states. FHWA is in the process of addressing this recommendation. The importance of incorporating a data-driven, risk-based approach in FHWA's oversight of bridge safety was recently underscored by Congress in its Joint Explanatory Statement accompanying the fiscal year (FY) 2009 Omnibus Appropriations Act.<sup>12</sup>

---

<sup>7</sup> Scour is the erosion of material due to flowing water that can undermine a bridge's foundation. Scour is the leading cause of bridge failure and an emphasis for FHWA since the collapse of the Schoharie Creek Bridge in New York in 1987. Scour mitigation requirements were explicitly incorporated into NBIS in 2004.

<sup>8</sup> 23 U.S.C. §144 (2006).

<sup>9</sup> 23 U.S.C. §106 (2006).

<sup>10</sup> FHWA, "Policy on Stewardship and Oversight of the Federal Highway Programs," June 22, 2001.

<sup>11</sup> Typically, one bridge engineer is located in each Division Office. The person responsible for conducting the annual review could have a title other than bridge engineer, such as structures engineer. Division Offices are located in each state, the District of Columbia, and Puerto Rico.

<sup>12</sup> Joint Explanatory Statement accompanying Division I (Transportation, Housing and Urban Development, and Related Agencies) of the FY 2009 Omnibus Appropriations Act (2009).

## **FHWA Lacks Sufficient Data To Evaluate States' Use of HBP Funds To Improve the Nation's Deficient Bridges**

FHWA lacks sufficient data to evaluate whether the billions of dollars apportioned to states to improve deficient bridges were used effectively in improving the condition of such bridges—a requirement of Federal statute and FHWA policy. After the former Federal Highway Administrator testified before Congress in September 2007 that the agency could obtain data on how much HBP funding was spent on structurally deficient bridges,<sup>13</sup> FHWA officials determined that its accounting system could not link expenditures of HBP funds to improvements made to deficient bridges. According to state transportation officials, state accounting systems also lack this capability.

We found during our field work in Kentucky, Pennsylvania, and Michigan that FHWA Division Offices do not evaluate whether HBP funds are invested effectively in improving the condition of deficient bridges. Specifically, Division Offices determine whether to approve projects identified in states' multi-year capital improvement plans by examining a project's scope of work, conformity to acceptable engineering design and construction practices, Federal-aid eligibility, and the availability of requested Federal funds.

FHWA can identify the overall amount of HBP funds apportioned to states to improve deficient bridges using its accounting system, the Fiscal Management Information System (FMIS). However, FMIS tracks expenditures only at the project level and lacks the details necessary to link expenditures to improvements made to deficient bridges. That is, data on project-level expenditures do not include sufficient details on how states use HBP funds on the individual elements within a project. Depending on a project's size, it could include deficient and non-deficient bridges, tunnels, roads, and other elements not related to bridges.<sup>14</sup> For example, Michigan is using almost \$3 million in HBP funds on a project that involves preventive maintenance on four deficient and three non-deficient bridges. A Pennsylvania project was approved for \$82 million in non-HBP Federal-aid highway funds that involves five deficient and five non-deficient bridges. However, FMIS lacks the capability to determine how much Federal-aid goes toward improving the condition of these states' deficient bridges. In interviewing state officials in Kentucky, Pennsylvania, and Michigan, we found that states rely on project-based accounting systems, which also lack specific details on expenditures.

---

<sup>13</sup> Hearing on Structurally Deficient Bridges held September 5, 2007, before the U.S. House of Representatives Committee on Transportation and Infrastructure.

<sup>14</sup> A project is defined as an undertaking by a state highway department for highway construction, including preliminary engineering, acquisition of rights-of-way and actual construction, for highway planning and research, or for any other work or activity to carry out the provisions of the Federal laws for the administration of Federal aid for highways (23 C.F.R. §1.2 (2008)).

Data in FHWA's National Bridge Inventory (NBI)<sup>15</sup> may indicate whether HBP funding has had an impact on improving the condition of deficient bridges. From FY 2001 to FY 2008, Michigan received \$1.1 billion in HBP funds; and the number of deficient bridges and the deck area of deficient bridges in the state declined. In contrast, Kentucky received \$535 million and Pennsylvania received \$3.5 billion and yet the number of and deck area of deficient bridges in both states increased. However, the NBI lacks information on states' use of Federal-aid highway funds, and therefore, cannot be used to determine whether states made effective use of HBP funds.<sup>16</sup> Table 1 below compares the amount of HBP funding received to the condition of bridges in each state.

<b>Table 1. A Comparison of HBP Funding and Bridge Condition Data</b>			
	<b>HBP Funding Received (2001 – 2008)</b>	<b>Change in Deficient Bridges (2001 – 2008)</b>	<b>Change in Deck Area (m<sup>2</sup>) on Deficient Bridges (2001 – 2008)</b>
Kentucky	\$535 Million	359	321,466
Michigan	\$1.1 Billion	(536)	(274,077)
Pennsylvania	\$3.5 Billion	963	453,999

Source: OIG analysis using FHWA Notices and NBI data

The need for further evaluation of states' use of funds is underscored in the case of Pennsylvania. From FY 2001 to FY 2008, the state chose to transfer approximately \$1.2 billion to other Federal-aid highway programs. Although states have the statutory authority to perform these transfers, the transfers run counter to the intent of the HBP, which is to improve the Nation's bridges. According to state officials, the transferred HBP funds were used to improve bridge conditions; but they could not provide documentation to prove this.

FHWA uses NBI data to establish performance goals at the state and national levels for improving the condition of deficient bridges. However, FHWA lacks a systematic method of coordinating with states to establish such goals. For example, FHWA Headquarters provides a baseline of states' current performance with performance targets to Division Offices but does not require them to coordinate or share the results with states. Ensuring the effective use of HBP funding in improving the condition of deficient bridges nationwide requires that FHWA coordinate with states because states determine which projects will be federally financed. Further, reports on progress made in achieving goals for

<sup>15</sup> The National Bridge Inventory is a database maintained by FHWA using data states submit annually on the Nation's approximately 600,000 public highway bridges.

<sup>16</sup> According to FHWA officials, FMIS and the NBI were not originally designed to store data linking expenditures of HBP funds to improvements made to deficient bridges.

improving the condition of deficient bridges can be a source of valuable information to internal and external stakeholders on how well the program is functioning. For example, FHWA regularly issues a report to Congress that provides information on the operational performance of the highway system, which could potentially be used to report progress each state has made in achieving its goals.<sup>17</sup>

Critical examination of the effectiveness of bridge funding is necessary given the deteriorating condition of structurally deficient bridges on the National Highway System (NHS) that carry the majority of the Nation's bridge traffic. Despite increases in HBP funding, from \$4.3 billion in FY 2001 to \$5.1 billion in FY 2008, the deck area of structurally deficient NHS bridges increased by 5 percent, although the overall number of structurally deficient bridges declined. (Additional information on historical trends related to structurally deficient bridges is in exhibit B.)

### **FHWA Lacks the Criteria and Guidance Necessary To Determine States' Compliance With Bridge Inspection Standards**

Inconsistencies in FHWA's enforcement of bridge inspection standards under the NBIP are attributable to a lack of standard criteria defining how bridge engineers should assess states' overall compliance. Further, FHWA lacks clear and comprehensive guidance on what actions bridge engineers should take when states fail to substantially comply. As a result, FHWA has little assurance that states receiving Federal-aid highway funds adequately comply with bridge inspection standards and that bridge engineers consistently address higher priority safety risks. FHWA officials stated that initiatives are underway to improve states compliance with the NBIS, including the development and implementation of criteria and guidance that incorporate data-driven, risk-based bridge oversight. However, FHWA has not conducted a workforce assessment to determine what resources are needed to implement these initiatives.

#### *Lack of Standard Criteria to Assess States' Overall Compliance*

Despite serious incidents of states' noncompliance, FHWA Division Offices concluded that states are substantially compliant with bridge inspection standards because FHWA has not developed standard criteria to assess states' overall compliance. NBIS consists of approximately five general areas of compliance with each including numerous requirements to ensure bridge safety. For example, the area of inspection frequency includes a requirement that bridges undergo a routine inspection at least every 24 months. However, FHWA has not defined how the bridge engineers conducting the annual compliance review should make a

---

<sup>17</sup> FHWA, "2006 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance," January 22, 2007.

determination of states' overall compliance, such as which areas require greater consideration because they pose higher priority bridge safety risks. Consequently, Federal-aid highway funds were provided to states with serious incidents of noncompliance.

FHWA bridge engineers must report whether a state department of transportation is, or is not, in substantial compliance with the requirements of the NBIS, but have no standard criteria to help them make this determination. Figure 2 below is an excerpt from FHWA's report template that the 52 Division Offices use to record the results of the annual NBIS compliance review. The excerpt illustrates that a determination of overall compliance is required as part of the review and that no explanation is provided as to how bridge engineers should make their determination on states' substantial compliance.

**Figure 2. Excerpt from FHWA's NBIS Compliance Review Report Template**

The purpose and scope of the review is to evaluate the policies, procedures and operating practices used by the <State Department of Transportation> to fulfill the requirements of the National Bridge Inspection Standards (NBIS) (23CFR650C). This review was conducted at < locations where review was performed (State HQ, Districts, Counties, Cities)>. **The <State Department of Transportation> < is, is not> in substantial compliance with the requirements of the NBIS.**

Source: NBIS Annual Program Review Report Form for 2009, FHWA (emphasis added)

We surveyed Division Office bridge engineers who identified themselves as having dealt with compliance-related problems as part of the 2007 and 2008 annual NBIS compliance reviews and found that they generally agreed that FHWA needs better criteria to assess states' overall compliance. Of the 11 engineers surveyed, 9 responded that FHWA lacked adequate criteria. We also found that respondents were using widely different approaches in completing their assessments of states' compliance. For example, there were respondents who did not differentiate between substantial and non-substantial deficiencies when assessing compliance and there were differences in how respondents assessed the timeliness of bridge inspections. Additionally, based on our analysis of data from FHWA's 2007 annual NBIS compliance review, we found some cases where bridge engineers reported substantial compliance in spite of deficiencies that could pose serious risks to public safety. For example, one bridge engineer judged a state to be substantially compliant despite reporting that the state failed to close 96 bridges, as required by NBIS. Similarly, a different bridge engineer in another state reported that 47 bridges were not closed, as required; but concluded that the state was substantially compliant. In two other examples, bridge engineers reported states as substantially compliant even though 200 bridges in one case and

over 500 bridges in the other case were not posted with maximum weight limit signs, as required.<sup>18</sup>

### *Lack of Clear and Comprehensive Guidance Impedes Enforcement Actions*

FHWA's lack of clear and comprehensive guidance defining procedures Division Offices should follow to enforce compliance has led to inconsistencies in enforcement activities and delays in states' remediation of deficiencies. According to FHWA, failure to substantially comply with bridge inspection standards is grounds for a suspension of Federal-aid highway funds<sup>19</sup> in accordance with a statute that authorizes the U.S. Secretary of Transportation to withhold funding if Federal-aid highway projects are not being properly maintained.<sup>20</sup> However, our survey of 11 bridge engineers found that, generally, engineers were unclear about when noncompliance could lead to a suspension. For example, of the 11 bridge engineers we surveyed, 7 responded that FHWA's guidance did not adequately define when to suspend funds. Further, eight responded that noncompliance with any NBIS requirement could be used to justify a suspension, whereas three others identified only select NBIS requirements as justification for a suspension.

Survey respondents also supplied evidence that the lack of adequate guidance contributes to delays in states' remediation of deficiencies. For example, two bridge engineers reported that they had notified their respective states of scour-related deficiencies. One state's corrective action plan adhered to the timeline FHWA suggested; but the other state rejected FHWA's recommended dates and extended the deadlines by up to 2 years. In a separate example, it took about 2 years for a state to comply with NBIS requirements on procedures related to critical inspection findings. According to the NBIS, a critical finding is a structural or safety-related deficiency that requires immediate follow-up inspection or action.

The development of guidance defining FHWA's procedural steps for enforcing compliance with the NBIS is critical to the agency's efforts to implement data-driven, risk-based bridge oversight. As stated in our January 2009 report, FHWA's annual NBIS compliance review lacked a systematic, data-driven method of assessing risks and determining, in coordination with states, what

---

<sup>18</sup> Division Office officials informed us that these deficiencies could be attributable to errors in states' bridge databases. However, we found no evidence of concerns about the accuracy of state data in the compliance review reports submitted to FHWA Headquarters or of efforts to assess data quality prior to concluding that a state was compliant.

<sup>19</sup> FHWA, "Compliance with the National Bridge Inspection Standards, Frequency of Inspection and Load Posting of Bridges," May 14, 1985.

<sup>20</sup> 23 U.S.C. §116 (2006).

actions to take to address them. A risk analysis generally involves estimating a risk's significance, assessing the likelihood of its occurrence, and deciding what actions should be taken to address it. FHWA's enforcement actions, such as how much time states are given to remediate deficiencies and whether to suspend Federal-aid highway funds, should reflect the results of a data-driven assessment of a risk's significance and its possible effect on the safety of the traveling public. More assertive enforcement actions would be necessary in those cases where higher priority safety risks are identified.

### *Lack of a Workforce Assessment Impedes FHWA's Oversight Initiatives*

Although FHWA has initiatives underway to improve states' compliance with bridge inspection standards, it has not conducted a comprehensive workforce assessment that prioritizes staffing and training needs. Such an assessment would enable the agency to more effectively direct limited funds to higher priority needs. Funding for bridge inspector training and workshops is limited because FHWA relies exclusively on general operating funds to cover human resource and training costs rather than use HBP funds to help cover these costs. However, our review of Title 23 found that section 151(d) would permit the use of HBP funds to carry out the NBIP.<sup>21</sup>

## **CONCLUSIONS**

Given the needs of the Nation's approximately 600,000 bridges and the limited funding available to invest in their replacement and rehabilitation, FHWA must strengthen its efforts to evaluate states' use of HBP funds in improving the condition of deficient bridges nationwide. Current practices do not provide assurance that states are using HBP funding effectively in improving the condition of deficient bridges. Further, given the potentially catastrophic risks of not properly inspecting bridges, FHWA must determine with greater consistency whether states complied with the NBIS and define procedural steps for enforcing compliance.

## **RECOMMENDATIONS**

To strengthen its oversight of Federal-aid funds, we recommend that the Federal Highway Administrator:

1. Collect and analyze HBP expenditure data on a regular basis to identify activities undertaken by states, such as bridge replacement and rehabilitation, to improve the condition of the Nation's deficient bridges.

---

<sup>21</sup> 23 U.S.C. §151 (2006).

2. Collaborate with states in setting quantifiable performance targets to measure progress in improving the condition of deficient bridges.
3. Report regularly to internal and external stakeholders on the effectiveness of states' efforts to improve the condition of the Nation's deficient bridges based on the analysis of HBP expenditure data and an evaluation of progress made in achieving performance targets.
4. Develop detailed criteria to help bridge engineers determine with greater consistency whether states demonstrate overall compliance with the NBIS.
5. Develop a policy providing clear, comprehensive, risk-based guidance that defines procedures Division Offices should follow to enforce compliance with the NBIS.
6. Conduct a workforce assessment so that FHWA can identify strategic needs and target limited funding to higher priority staffing and training needs in implementing data-driven, risk-based bridge oversight.

## **AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE**

We provided a draft of this report to FHWA for review and comment on October 22, 2009. FHWA provided us formal comments on December 11, 2009. Those comments are included as an appendix to this report.

FHWA concurred with all our recommendations, and its planned actions include evaluating the integration of current stand alone systems to improve bridge project information, as well as the establishment of clear, comprehensive, risk-based guidance for enforcing compliance with the NBIS. FHWA noted that it seeks to strike a balance between what is possible and achievable in the near term with existing resources, systems, and data and what may be achievable in the future. Specifically, FHWA stated that its efforts to obtain information on state use of Federal funding for deficient bridges and their resulting improvement in condition could be significantly affected by changes to the Federal-aid program and the HBP as a result of reauthorization.

We recognize that potential reauthorization changes, such as modifications to the HBP, could impact the specific information gathered on states' use of bridge funding, but we also maintain that taking action prior to reauthorization will make it easier to carry out the expected mandates. Based on our analysis of a pending congressional proposal for the reauthorization, expected new requirements include monitoring each state's use of Federal funding, setting performance targets for

each state to reduce the deck area of bridges classified as structurally deficient, and directing states to report on their use of Federal funding and progress made towards meeting performance targets. Consequently, through its efforts in response to our recommendations, FHWA should be better prepared for implementation of these new requirements as part of the reauthorization.

### **ACTION REQUIRED**

FHWA's actions taken and planned for recommendations 1 through 5 are reasonable and subject to our follow-up provisions. In its response to recommendation 6, FHWA stated that it conducted a workforce assessment in February 2009. In accordance with Department of Transportation Order 8000.1C., we request that FHWA provide additional information on the workforce assessment and its results within 30 calendar days of the date of this report in order for us to determine if it meets the intent of our recommendation and whether to close the recommendation.

We appreciate the cooperation and assistance provided by FHWA representatives during our audit. If you have any questions concerning this report, please call me at (202) 366-5630.

#

## **EXHIBIT A. SCOPE AND METHODOLOGY**

We evaluated the Highway Bridge Program (HBP) and the National Bridge Inspection Program (NBIP) to assess FHWA's: (1) oversight of Federal-aid funds provided to states through the HBP for deficient bridges and (2) enforcement of bridge inspection standards under the NBIP, such as suspending Federal-aid highway funds when states fail to adequately comply with standards. As part of this audit, we examined how FHWA could better implement data-driven, risk-based bridge oversight and incorporated related information from our January 2009 report as appropriate. This report concludes our audit work for the two remaining efforts announced in August 2007 related to FHWA's oversight of the Nation's bridges.<sup>22</sup>

To conduct this audit, we interviewed staff members of FHWA's Office of Bridge Technology, Office of Asset Management, Office of the Chief Financial Officer, Office of Policy and Governmental Affairs, and the American Association of State Highway Transportation Officials. We conducted site visits in Michigan, Kentucky, and Pennsylvania to perform standardized in-depth, in-person interviews with FHWA Division Office staff and state transportation officials. These states were selected based on our analysis of NBI data from 2001 to 2007 using a measure of the percentage of deck area on structurally deficient bridges. We began our audit with a specific focus on structurally deficient bridges, and later added functionally obsolete bridges in our evaluation of FHWA's oversight of HBP funds for all deficient bridges. We identified a substantial reduction in the percentage of deck area on structurally deficient bridges for Michigan, an increase for Kentucky, and almost no change for Pennsylvania. We also selected Pennsylvania because of its unusually high net transfers of HBP funding from FY 2001 through FY 2007, which were almost half of all net transfers out of HBP for the time period. In addition, we reviewed relevant laws, regulations, policies, program documents, and other documentary evidence, including performance measures.

We analyzed the results of FHWA's 2007 annual NBIS compliance review to identify compliance-related problems and contacted Division Offices as necessary to validate data obtained from the compliance review reports. We also conducted two surveys of Division Office staff—an initial survey of all Division Office bridge engineers and then a more in-depth, follow-up survey of the 11 engineers who identified themselves as having dealt with compliance-related problems as part of the 2007 or 2008 annual NBIS compliance reviews. In the follow-up survey, we obtained information related to FHWA's enforcement activities and

---

<sup>22</sup> OIG, "Inspector General's Response to Secretary Peters' Request for an Assessment of the National Bridge Inspection Program," August 3, 2007.

correspondence regarding enforcement actions taken during 2007 and 2008. We conducted the surveys using standardized questionnaires sent via email.

Further, we obtained and reviewed FMIS data. We intended to use the data to identify the impact of HBP funding on structurally deficient bridges. However, after we learned that FMIS lacked sufficient data to perform this analysis, we focused on identifying the total amount of HBP funding received by the states selected for site visits. In evaluating the reliability of FMIS data, we reviewed a recent audit performed by an independent auditor, which determined that financial statements produced by FMIS were accurate.<sup>23</sup> Based on those results, we concluded that the data were sufficiently accurate for our purposes.

We started our audit using NBI data from 2001 to 2006 and incorporated 2007 and 2008 data as they became available. We used data from 2001 to 2007 to select states for our site visits and used NBI data over the entire time period in developing our findings. Our past work and the work of others have identified limitations with NBI data. However, we determined that despite its limitations, the NBI is the most comprehensive source of data on bridges nationwide and that the data were sufficiently reliable for the purposes of helping to target our interviews and, together with other evidence, establish sufficient support for our findings and recommendations. We tested a random sample of 2008 NBI data for 30 highway bridge records, including 10 each from Michigan, Kentucky, and Pennsylvania. We also tested several data points used to support our audit findings, including bridge condition, dimensions, alignment, and highway system. This limited testing of FHWA's NBI data indicated the data were complete and adequately reflected the source data from the states' bridge records.

Our audit was conducted from August 2007 through July 2009. We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards as prescribed by the Comptroller General of the United States. 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 provides a reasonable basis for our findings and conclusions based on our audit objectives.

---

<sup>23</sup> Independent Auditors' Report issued by KPMG for U.S. Department of Transportation Highway Trust Fund as of September 30, 2007 and 2006.

## EXHIBIT B. BACKGROUND ON HISTORICAL TRENDS RELATED TO STRUCTURALLY DEFICIENT BRIDGES

According to the National Bridge Inventory (NBI), the number of structurally deficient bridges decreased from 83,630 to 71,469, or about 15 percent, from 2001 through 2008. However, these figures can be misleading in assessing improvement in bridge conditions because they do not take into account other important factors, such as the size of structurally deficient bridges as measured by deck area and the amount of bridge traffic. Table 2 below compares the condition of bridges nationwide from 2001 through 2008. During this time frame, although the number of structurally deficient bridges declined almost 15 percent, the deck area of structurally deficient bridges declined nationwide by a comparatively much smaller amount of 2 percent. When focusing specifically on National Highway System (NHS) bridges, which carry a large majority of the Nation's bridge traffic, conditions have actually worsened as the deck area of structurally deficient NHS bridges increased by 5 percent.

<b>Table 2. Structurally Deficient Bridges Comparison between 2001 and 2008</b>				
	<b>Bridges</b>		<b>Change</b>	
	<b>2001</b>	<b>2008</b>	<b>Number</b>	<b>Percentage</b>
All Highway Systems	83,630	71,469	(12,161)	(14.5%)
NHS	6,643	6,051	(592)	(8.9%)
	<b>Deck Area (m<sup>2</sup>)</b>		<b>Change</b>	
	<b>2001</b>	<b>2008</b>	<b>Deck Area (m<sup>2</sup>)</b>	<b>Percentage</b>
All Highway Systems	31,505,907	30,890,605	(615,302)	(2.0%)
NHS	12,455,463	13,079,674	624,211	5.0%
Source: OIG analysis using NBI data				

**EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT**

<b><u>Name</u></b>	<b><u>Title</u></b>
Eric Mader	Program Director
Christopher Brothers	Project Manager
Stephen Gruner	Project Manager
Kimberley Bolding	Senior Auditor
Michael Dzandza	Auditor
Regan Maund	Analyst
Jean Tanaka	Analyst
Rodolfo Pérez	Engineer Advisor
Aron Wedekind	Engineer

## APPENDIX. MANAGEMENT COMMENTS



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

# Memorandum

Subject: **INFORMATION**: Federal Highway Administration (FHWA)  
Response to Office of Inspector General (OIG) Draft Report,  
“Assessment of FHWA Oversight of the Highway Bridge Program  
and the National Bridge Inspection Program”

Date: December 11, 2009

From: Victor M. Mendez  
Administrator

Reply to  
Attn. of: HIF/HAIM

To: Calvin L. Scovel III  
Inspector General (JA-40)

The FHWA has long recognized the critical importance of highway bridges to the safe and effective functioning of our Nation’s highway system. For that reason, the FHWA has established programs intended to help States identify deficient bridges, track the condition of those bridges, and target funding for bridges. The FHWA’s efforts in this regard have met with some success in improving the condition of the Nation’s highway bridges. Over the last 10 years the number of deficient bridges in the Nation’s inventory decreased from 31.4 percent to 26.9 percent.

The FHWA’s existing systems, including the Fiscal Management Information System (FMIS), which tracks expenditures, and the National Bridge Inventory (NBI), which tracks bridge specific information, have served their intended purpose well for many years. These stand-alone legacy systems have enabled the creation and use of the performance measures used to monitor bridge conditions today. Creating new performance measures targeted at spending on the structurally deficient subset of the Nation’s bridges will challenge the capabilities of these systems. Such targeted performance measures will likely require additional data, increased capabilities, and potentially new authorities that may be considered through the surface program reauthorization.



In responding to the report's recommendations, we are seeking to strike a balance between what is possible and achievable in the near term with existing resources, systems and data, and that which may be achievable in the future. As we proceed through the course of surface reauthorization, the FHWA will be mindful of the report's findings and recommendations and as possible, will seek those enhancements that could enable more detailed tracking of fund use by States on the subset of deficient bridges and their accompanying change in condition. The FHWA also agrees that assessing and enforcing National Bridge Inspection Standards (NBIS) compliance with greater consistency is achievable through data-driven, risk-based bridge oversight. In response to the Phase I OIG audit recommendations from January 2009, the FHWA moved forward in developing detailed criteria and policy to achieve greater uniformity for determining compliance.

The following are the OIG draft report's specific recommendations and our responses.

**Recommendation 1:** Collect and analyze Highway Bridge Program (HBP) expenditure data on a regular basis to identify activities undertaken by states, such as bridge replacement and rehabilitation, to improve the condition of the Nation's bridges.

**Response:** Concur. Using the existing legacy systems, the FHWA has fulfilled the Federal-aid program requirements under Title 23 of the United States Code. Specifically, the FHWA administers the HBP through use of the NBI. The NBI data is utilized to determine States' bridge needs and apportion HBP funds. Additionally, the FHWA monitors and tracks the condition of the Nation's bridges through the NBI. As discussed above, these measures indicate that there is some improvement in the overall condition of the nation's highway bridges. While we recognize that potentially useful and effective information could be derived with the collection of more specific information on State use of Federal funding on deficient bridges and the resulting improvement in condition, it is not clear that this level of specificity is achievable in the near term.

Recognizing the potential for useful modification to existing performance information, by May 1, 2010, the FHWA will evaluate possible enhancements for collecting and analyzing expenditures on the Nation's bridges, such as integration of current stand alone systems and collection of more detailed project information. Once feasible near term enhancements are identified, the FHWA will develop an implementation schedule. It is important to recognize that the outcome of these considerations could be significantly affected by any changes to the Federal-aid program and the HBP as a result of reauthorization.

**Recommendation 2:** Collaborate with States in setting quantifiable performance targets to measure progress in improving the condition of deficient bridges.

**Response:** Concur. Currently, the FHWA strategic plan identifies bridge conditions on all public roads as an outcome measure. The FHWA tracks the deck area on deficient bridges as the bridge condition outcome measure and has established annual performance targets. In anticipation of an increased performance focus moving forward, the FHWA established the Performance Management Transition Team, comprised of cross-functional, geographically dispersed members representing various FHWA offices, to outline a plan for the Agency to transition to a performance-based Federal-aid program, which would include system performance goals and measures. The FHWA will ensure

that the goals and performance measures address improvements to bridge conditions, to the extent that data and systems are capable. Completion of this effort will be subsequent to the next surface authorization, in order to ensure that these goals and measures are in accord with any new requirements.

**Recommendation 3:** Report regularly to internal and external stakeholders on the effectiveness of States' efforts to improve the condition of the Nation's deficient bridges based on the analysis of the HBP expenditure data and an evaluation of progress made in achieving performance targets.

**Response:** Concur. Currently, the FHWA regularly issues a report to Congress that provides information on the operational performance of the Nation's highway system – *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance (C&P Report)*. By May 1, 2010, the FHWA will evaluate the possible use of this publication to report on the effectiveness of States' efforts to improve the condition of the Nation's bridges. Information on States efforts to improve the condition of deficient bridges will be offered to the extent possible within the limitations discussed above.

**Recommendation 4:** Develop detailed criteria to help bridge engineers determine with greater consistency whether States demonstrate overall compliance with the NBIS.

**Response:** Concur. Our comprehensive approach to addressing the Phase I OIG audit recommendations from January 2009 incorporates actions that specifically address this recommendation. During the 2011 annual review cycle, the FHWA plans to implement a new National Bridge Inspection Program (NBIP) oversight process and procedures. The process will include specific risk-based criteria for assessing compliance. The FHWA has drafted detailed criteria designed to achieve the goal of this recommendation. The draft criteria consists of more than 20 specific metrics linked to the NBIS regulatory provisions, such as inspection frequency and inspector qualifications, with defined risk tolerance levels for compliance, substantial compliance, and non-compliance determination. Application of the defined criteria will improve the consistency in determining compliance with the NBIS. The current schedule calls for a number of Division Offices to pilot the new process and procedures in 2010 followed by full implementation during 2011. The target date for completion of the new process and procedures is December 31, 2010.

**Recommendation 5:** Develop a policy providing clear, comprehensive, risk-based guidance that defines procedures Division Offices should follow to enforce compliance with the NBIS.

**Response:** Concur. The FHWA has drafted a policy that provides clear, comprehensive, risk-based guidance for defining procedures for Division Offices to follow when enforcing compliance with the NBIS. It will be introduced in 2011 as part of the new oversight process described in response to recommendation 4.

**Recommendation 6:** Conduct a workforce assessment so that the FHWA can identify strategic needs and target limited funding to higher priority staffing and training needs in implementing data-driven, risk-based bridge oversight.

**Response:** Concur. The FHWA conducted a workforce assessment in February 2009, and the structures discipline was included in the assessment. The results of the assessment are being used for multiple purposes including the identification of staff training needs and gaps in knowledge areas and skills. Additionally, as noted above, the FHWA plans to conduct a pilot of the new NBIP oversight process and procedures during 2010. As part of the pilot, the FHWA will assess the impact of the changes on our bridge workforce and identify training needs. Our goal is to implement an approach to oversight that is achievable using existing resources. We have begun to explore the use of program funds to support oversight of the NBIP. Should additional resources become available in the future, we will revisit resource allocation among the higher bridge risk areas faced by the Agency. Given the workforce assessments already completed and the plan to assess the impacts associated with implementation of the new oversight process, the FHWA considers this recommendation closed.

In closing, the FHWA expresses its appreciation and support of the OIG's efforts to further improve the FHWA's oversight of the National Bridge Inspection and Highway Bridge Programs. If you have any questions or comments regarding this response, please contact Mr. Myint Lwin at (202) 366-4589.