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Report to Congressional Requesters

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FEDERAL-AID HIGHWAYS

FHWA Has Improved Its Risk Management Approach, but Needs to Improve Its Oversight of Project Costs

GAO

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GAO-09-751

Highlights

Highlights of GAO-09-751, a report to congressional requesters

FEDERAL-AID HIGHWAYS

FHWA Has Improved Its Risk Management Approach, but Needs to Improve Its Oversight of Project Costs

Why GAO Did This Study

The federal-aid highway program provides about $33 billion a year to states for highway projects. The federal government provides funding for and oversees this program, while states largely choose and manage the projects. As requested, GAO reviewed the Federal Highway Administration's (FHWA) implementation of several requirements in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU): (1) oversight of states using a risk management approach; (2) efforts to develop minimum standards for estimating project costs, and periodically evaluate states' cost estimating practices; and (3) reviews of states' financial management systems. GAO also reviewed FHWA's policy on presenting an estimate of financing costs in financial plans for major projects (i.e., projects estimated to cost over $500 million). GAO reviewed FHWA plans, risk assessments, reviews, and other documents; visited five FHWA field offices and reviewed financial management reviews in an additional five field offices; and interviewed FHWA officials.

What GAO Recommends

GAO is making recommendations to improve FHWA's tracking of risks and its oversight of states' estimates of project costs, financial management systems, and financial plans for major projects. The Department of Transportation stated it would consider the report's recommendations.

View GAO-09-751 or key components.
For more information, contact Phillip Herr at (202) 512-2834 or herrp@gao.gov.

What GAO Found

FHWA has improved its approach to managing risks to the federal-aid highway program by requiring field offices to identify risks, assess them on the basis of the potential impact and the likelihood they will occur, and develop response strategies for key risks in their planned oversight activities. For fiscal years 2007 through 2009, most of the field offices GAO visited had oversight activities to address a majority of the key risks. However, most of the field offices that GAO visited were not fully tracking risk mitigation activities, thereby limiting the effectiveness of FHWA's efforts to mitigate risks to the federal-aid highway program.

FHWA has made limited progress in meeting SAFETEA-LU's requirement to develop minimum standards that states must follow when estimating project costs. GAO has reported that project cost estimates typically have not been reliable predictors of project costs or financing needs. While FHWA has efforts under way, it is unlikely to issue standards until 2011, at the earliest. In addition, FHWA has not established a process to periodically evaluate states' cost estimating practices, and four of the five field offices GAO visited were doing little in this regard. However, for major projects, FHWA has established a process for evaluating the credibility of states' cost estimates. Establishing standards for cost estimates and periodically evaluating states' cost estimating practices could help to ensure that highway projects are effectively and efficiently managed.

FHWA's guidance and documentation for reviews of state departments of transportation's financial management systems and practices generally meet key federal standards and principles, but they lack specific steps and documentation in some key areas. For example, FHWA's guidance does not require reviewers to provide certain specific information on improper payments. In addition, while the 10 field offices that GAO reviewed generally covered the required areas in their financial management reviews in 2008, their documentation sometimes lacked information on the specific procedures performed or issues identified by reviewers. Without this information, it is difficult for FHWA to monitor and follow up on field offices' and states' progress in correcting deficiencies.

FHWA does not require states' financial plans for major projects to present an estimate of the projects' financing costs. According to a senior FHWA official, this is partly because it is difficult to develop accurate estimates. While uncertainty about a major project's financing cost can exist, and presenting estimates of financing costs for all projects could be impractical, financing costs on major projects can represent a significant cost to a state, and can, when combined with payments on the principal portion of the debt, tie up large shares of future federal transportation funding. Presenting an estimate of a project's financing costs would help ensure that decision makers who approve funding for these projects have key information that is relevant to such decisions.

Contents

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
DBE	Disadvantaged Business Enterprise
DOT	Department of Transportation
FHWA	Federal Highway Administration
OMB	Office of Management and Budget
SAFETEA-LU	The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

United States Government Accountability Office
Washington, DC 20548

July 24, 2009

The Honorable James L. Oberstar
Chairman
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Peter A. DeFazio
Chairman
Subcommittee on Highways and Transit
Committee on Transportation and Infrastructure
House of Representatives

The federal-aid highway program provides about $33 billion a year to states for highway and bridge projects, often paying 80 percent of these projects' costs. The program is federally financed and state administered—that is, the federal government provides funding and oversees the program, while the states largely choose and manage the projects. These projects can take years of planning, environmental review, design, and construction. With highway congestion projected to worsen over the next 20 years and freight traffic expected to double, widespread consensus exists on the need to maintain and improve the nation's surface transportation infrastructure. At the same time, revenues to support the Highway Trust Fund—the major source of federal highway and transit funding—are eroding. Receipts for the fund are derived from motor fuel and truck-related taxes. These receipts are declining in purchasing power because the federal motor fuel tax rate—which has remained constant at 18.4 cents per gallon since 1993—has not kept pace with inflation.[1] Furthermore, as vehicles become more fuel efficient and increasingly run on alternative fuels, fuel taxes may not be a sustainable source of transportation financing. As a result, we have designated funding the nation's transportation infrastructure as a high-risk issue.[2] Ensuring that states effectively manage and control the cost and schedule performance

[1]GAO, *Highway Trust Fund: Improved Solvency Mechanisms and Communication Needed to Help Avoid Shortfalls in the Highway Account*, GAO-09-316 (Washington, D.C.: Feb. 6, 2009).

[2]GAO, *High-Risk Series: An Update*, GAO-09-271 (Washington, D.C.: January 2009); and *High-Risk Series: An Update*, GAO-07-310 (Washington, D.C.: January 2007).

of federally aided projects, and that federal funds are used efficiently and effectively, is critically important.

The Federal Highway Administration (FHWA), under the Department of Transportation (DOT), is responsible for overseeing the federal-aid highway program. FHWA oversees the program through its headquarters in Washington, D.C., and its 52 field offices in the 50 states, the District of Columbia, and Puerto Rico. FHWA delegates much decision making and program implementation authority to these field offices. FHWA reviews and approves the transportation plans and environmental impact assessments that states periodically prepare, as well as states' property acquisition activities; it also enforces a variety of requirements, such as civil rights laws, that states accept as a condition of federal aid. FHWA also oversees the design and construction of federally aided projects, but this oversight has evolved over the years and currently focuses on two broad areas: (1) for selected projects, direct review and approval of state design plans, contract awards, and construction progress and (2) process reviews—that is, reviews of state management processes—to ensure that the states have adequate controls to effectively manage federally assisted projects. FHWA requires its field offices to use a risk management approach to allocate oversight resources. Risk management typically includes assessments to identify and prioritize risks, and is used in a variety of contexts, including the management of government programs. For the federal-aid highway program, examples of risks that FHWA has identified include inadequate construction practices that could degrade the quality of state highway projects, and the risk that projects delegated by states to local governments may not meet federal requirements and could have cost or schedule overruns. FHWA has additional requirements for "major projects"—that is, generally those projects estimated to cost over $500 million—such as reviewing and approving annual finance plans required by law.[3]

We and others have raised concerns regarding FHWA's oversight of the federal-aid highway program. For example, in reports that we issued from 1997 to 2005, we highlighted several problems, including a lack of useful project cost estimates, which typically had not been reliable predictors of the project costs or financing needs. We also found that the guidance that

[3]FHWA's oversight also applies to projects between $100 million and $500 million. FHWA reviews and approves financial plans for major projects. For projects between $100 million and $500 million, financial plans have to be prepared, but FHWA does not approve them.

FHWA provided to states on developing cost estimates was voluntary and covered only major projects. In addition, we found that although FHWA field offices were assessing risks to the highway programs in their states, they were not always using their risk assessments to direct their process reviews. In 2005, Congress enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which authorized funding for the federal surface transportation programs from fiscal years 2005 through 2009.[4] SAFETEA-LU also established the following requirements for FHWA's oversight of the federal-aid highway program:

- annually review elements of each state Department of Transportation's (DOT) project delivery system;[5]
- develop minimum standards that state DOTs must follow when estimating project costs, and periodically evaluate state DOTs' practices for estimating project costs; and
- annually review elements of each state DOT's financial management system that affect projects.

SAFETEA-LU continued an earlier requirement for sponsors of major projects to submit a financial plan based on detailed cost estimates to complete the project and on reasonable assumptions, as determined by FHWA. FHWA evaluates states' cost estimates for major projects to assess the reasonableness of their assumptions. SAFETEA-LU also lowered the threshold for a project to be classified as major from $1 billion to $500 million.

You asked us to review FHWA's implementation of several requirements in SAFETEA-LU, including its (1) oversight of states' project delivery systems, in particular, its use of a risk management approach to allocate their oversight resources; (2) efforts to develop minimum standards for states to follow when estimating project costs, and to periodically evaluate states' cost estimating practices; and (3) efforts to review elements of states' financial management systems and practices that affect projects.

[4]Pub. L. No. 109-59 (Aug. 10, 2005).

[5]A project delivery system is the process used to move a project from a concept to a constructed facility, and the system includes planning, environmental review, design, property acquisition, and construction.

You also asked us to review FHWA's policy on presenting an estimate of financing costs in financial plans for major projects.

To address these objectives, we reviewed key agency and state documents and relevant regulations and legislation. We conducted interviews with FHWA and state DOT officials and representatives from the American Association of State Highway and Transportation Officials (AASHTO). In addition, we observed a risk management training class that is available to FHWA staff. We also visited 5 FHWA field offices that oversee states that receive a range of federal-aid dollars, several of which were overseeing a major project. Because we used a nonprobability sample, information obtained from the field offices that we visited cannot be generalized to all field offices. Also, we assessed financial management reviews in 5 additional randomly selected field offices, for a total of 10 field offices. We conducted this performance audit from June 2008 through July 2009 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 appendix I for a more complete description of our scope and methodology.

Background

Federal funding for highways is provided to the states mostly through a series of formula grant programs collectively known as the federal-aid highway program. Periodically, Congress enacts multiyear legislation that authorizes the nation's surface transportation programs. In 2005, Congress enacted SAFETEA-LU, which authorized $193.2 billion for the federal-aid highway program from fiscal years 2005 through 2009.

FHWA oversees the federal-aid highway program and distributes most funds to the states through annual apportionments established by statutory formulas. Once FHWA apportions these funds, they are available for states to obligate for construction, reconstruction, and improvement of highways and bridges on eligible federal-aid highway routes and for other purposes. About 1 million of the nation's 4 million miles of roads are eligible for federal aid—including the 161,000 mile National Highway

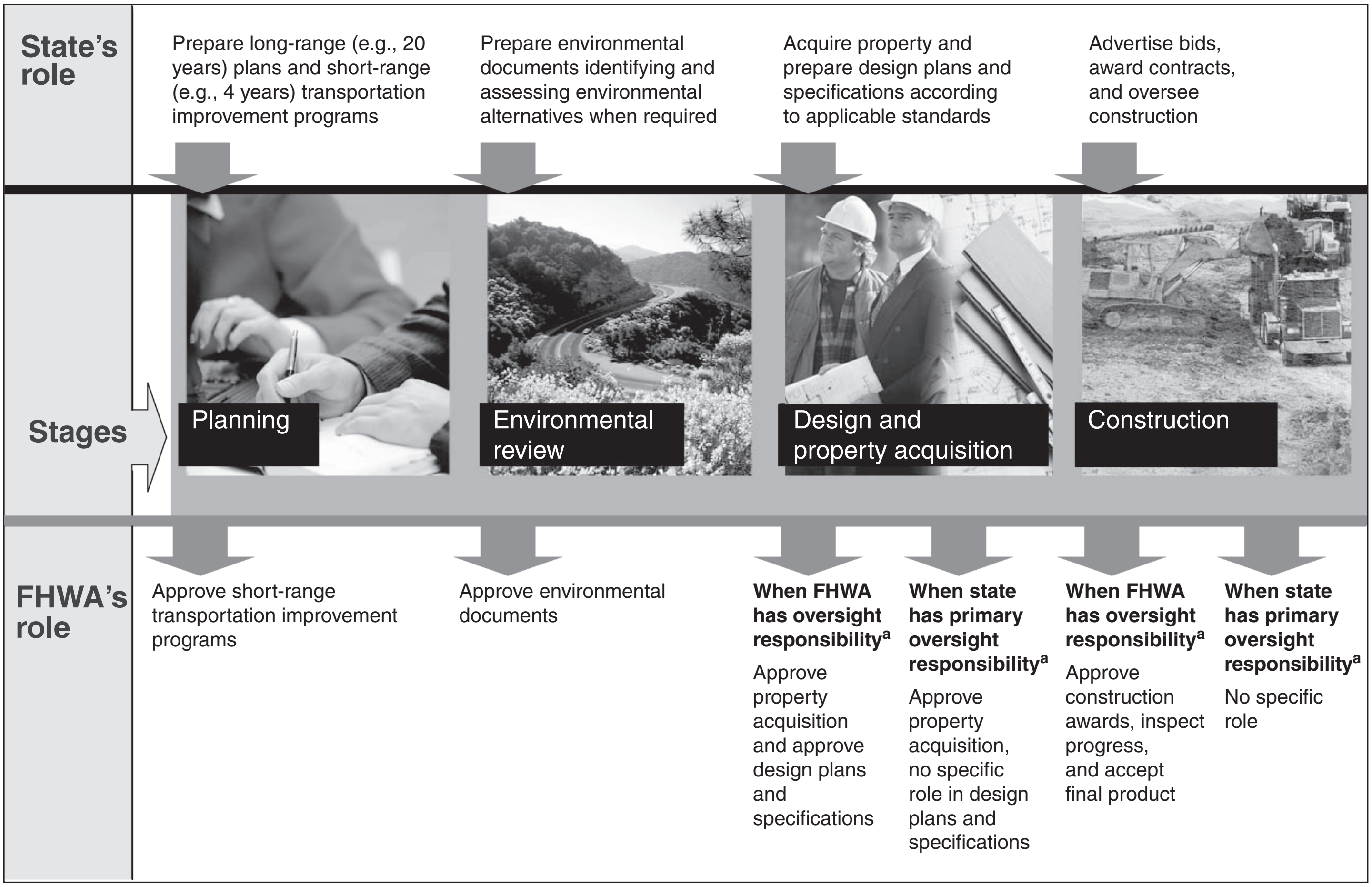
System, of which the 47,000 mile Interstate Highway System is a part.[6] While FHWA oversees and funds the program, the responsibility for selecting specific highway projects generally rests with state DOTs and local planning organizations, which have considerable discretion in determining how to allocate available federal funds among various projects. The federal-aid highway program is generally referred to as a federally assisted, state-administered partnership.

A highway or bridge construction or repair project usually has four stages: planning, environmental review, design and property acquisition, and construction. FHWA reviews and approves long-term and short-term state transportation plans and programs, environmental documents, and the acquisition of property for all highway projects.[7] However, its role in overseeing the design and construction of projects varies. On selected projects, FHWA exercises what is often considered "full" oversight, meaning that FHWA (1) prescribes design and construction standards, (2) approves design plans and estimates, (3) approves the selection of the contract award, (4) periodically inspects the progress of construction, and (5) renders final acceptance on projects when they are completed. However, relatively few projects are subject to this full FHWA oversight. Under current law, FHWA exercises full oversight of certain high-cost interstate system projects, while states oversee design and construction on other federal-aid projects. Figure 1 shows the stages of a highway or bridge project and the corresponding state role and FHWA approval actions. Table 1 shows the types of projects for which FHWA exercises full oversight, as compared with state oversight.

[6]The 1 million miles of roads eligible for federal aid accounted for about 83 percent of the vehicle miles traveled on the nation's roadways in 2007. The 3 million miles of roads that are generally ineligible are functionally classified as local roads or rural minor collectors.

[7]Specifically, FHWA approves state short-range transportation improvement programs and reviews state and metropolitan planning processes.

Figure 1: Stages of a Highway or Bridge Project and State and FHWA Roles and Approval Actions



Source: GAO.

[a]The types of projects for which FHWA exercises full oversight, as compared with state oversight, are shown in table 1 of this report.

Table 1: Types of Projects Receiving FHWA Oversight Versus State Oversight

Type of project	Miles of road	Percentage of federal highway funds obligated in 2006	Design and construction oversight	Exception
Interstate System	47,000	8%	FHWA oversight	Certain types of projects, or projects below a certain dollar threshold, in which FHWA and state determine that state oversight is appropriate
National Highway System, non Interstate routes	115,000	44	FHWA and state agree on which entity will provide oversight	State or FHWA determines state oversight is not appropriate
Federal-aid highways off the National Highway System	798,000	48	State assumes oversight	State determines that state oversight is not appropriate

Source: GAO analysis of FHWA data.

Over the past 12 years, we and others have identified problems with FHWA's oversight of the federal-aid highway program. For example:

- In 1997, we reported that the overall amount of and reasons for cost increases on highway and bridge projects could not be determined because data were not readily available from FHWA or the states.[8] We found on many of the projects for which we could obtain information that initial costs estimates—developed in connection with the environmental review stage of projects—had increased, sometimes significantly. Several factors accounted for the increases, including that these initial cost estimates were preliminary and were not designed to be reliable predictors of a project's cost.

- In our May 2002 testimony, we reported that FHWA had begun to improve its oversight by implementing Congress's finance plan requirements for major projects but opportunities existed for improving the quality of cost estimating and developing reliable and accurate information on the extent and nature of projects' cost performance to help direct federal oversight efforts.[9]

[8]GAO, *Transportation Infrastructure: Managing the Costs of Large-Dollar Highway Projects*, GAO/RCED-97-47 (Washington, D.C.: Feb. 27, 1997).

[9]GAO, *Transportation Infrastructure: Cost and Oversight Issues on Major Highway and Bridge Projects*, GAO-02-702T (Washington, D.C.: May 1, 2002).

- In 2003, the DOT Inspector General reported progress in FHWA's stewardship over major projects but identified improvements needed in eight areas, including developing more reliable cost estimates, managing project schedules better, and refocusing FHWA's efforts on project management and financial oversight.[10]

- We and others have raised concerns regarding FHWA's use of risk assessments to identify and prioritize risks to the federal-aid highway program. In 2004, the DOT Inspector General reported that FHWA's risk assessments did not provide a systematic approach for assessing program risks throughout the agency.[11] As a result, risk assessment results were not reliable or comparable across states. The Inspector General recommended that FHWA issue guidance to its field offices to ensure that risk assessments are conducted more strategically by identifying major programs and program components to be evaluated, correlating the assessments with agency priorities, and providing field offices with a disciplined methodology for evaluating and classifying program risks. In addition, in 2005, we reported that FHWA field offices were not always using risk assessments to help guide their reviews of state management processes.[12]

FHWA Has Improved Its Risk Management Approach but Is Not Fully Tracking Risk Mitigation Activities

FHWA has improved its risk management approach by requiring field offices to identify risks to the federal-aid highway program in their states, assess the risks on the basis of the potential impact and the likelihood that they will occur, and include response strategies for key risks in the offices' planned oversight activities. FHWA also has improved its use of risk assessments to guide oversight activities. However, most of the field offices that we visited were not fully tracking risk mitigation activities, thereby limiting the effectiveness of FHWA's efforts to mitigate risks to the federal-aid highway program.

[10]Statement of the Honorable Kenneth H. Mead, Inspector General, Department of Transportation, *Management of Cost Drivers on Federal-Aid Highway Projects*, (May 8, 2003).

[11]U.S. Department of Transportation, Office of Inspector General, *Managing Risk in the Federal-Aid Highway Program*, MH-2005-012 (Washington, D.C.: Nov. 19, 2004).

[12]GAO, *Federal-Aid Highways: FHWA Needs a Comprehensive Approach to Improving Project Oversight*, GAO-05-173 (Washington, D.C.: Jan. 31, 2005).

FHWA Has Improved Its Risk Management Approach and Is Using Risk Assessments to Guide Oversight

FHWA has improved its risk management approach by establishing a process for field offices to identify, assess, and respond to risks to the federal-aid highway program. Following the issuance of the 2004 DOT Inspector General report, FHWA issued risk management guidance to field offices in 2006, 2007, and 2008, and the Inspector General told us that FHWA has implemented the recommendation. FHWA has also developed risk management training and offers a class through the National Highway Institute. According to an FHWA official, senior management from each field office received the training in 2007.

FHWA's guidance requires field offices to identify risks to the federal-aid highway program (usually on an annual basis), assess the risks on the basis of the potential impact and the likelihood that they will occur, develop response strategies for key risks (typically, the top 10), and include these strategies in the offices' planned oversight activities. We assessed FHWA's risk management guidance and training against the best practices that we developed in the following four areas: strategic planning, identifying and assessing risks, implementing and monitoring risk mitigation plans, and evaluating and selecting alternatives for responding to risks.[13] We found that FHWA adequately reflected these best practices in the first three areas, but not the fourth. For example, in the area of strategic planning, FHWA's guidance directs staff to develop risk planning strategies and identify actions that could mitigate the impact of negative events. In addition, in the area of assessing risks, the guidance and training provide detailed discussion of considering the likelihood and potential impact of risks to help field offices prioritize identified risks. However, in the area of evaluating and selecting alternatives for responding to risk, FHWA's guidance and training have limited discussion of evaluating the impact of alternative response strategies in terms of their potential to reduce risks and their associated costs, or of documenting the basis for choosing the selected alternative.

Since our 2005 report, FHWA has improved its use of risk assessments to guide oversight activities. We found that risk assessments were a significant factor in determining oversight activities in the field offices that we visited for this work. Officials from these five field offices said they used risk assessments to inform their planned oversight activities for the year. In addition, for fiscal years 2007 through 2009, three of the five field offices documented planned oversight activities to address a majority of

[13] GAO, *Risk Management: A GAO Analysts' Guide.*

the key risks identified during their annual risk assessment process. The other two field offices addressed one-half or more of the risks in 2 of the 3 years. For instance, for fiscal year 2008, one field office identified 10 risks and documented a planned oversight activity for 9 of these risks in its performance plan. For example, to address risks associated with projects delegated by the state to local governments or agencies, over 20 percent of the field office's construction inspections in fiscal year 2008 focused on local projects. It found deficiencies in some areas, including construction documentation and meeting disadvantaged business enterprise goals.[14] In another field office we visited, staff identified a risk that inadequate construction practices could degrade the quality of state highway projects. To respond to the risk, the field office initiated a review of the state's practices for addressing discrepancies between the construction materials and methods used and the plans and specifications for projects. The review found that the state's process and guidance were adequate, but made recommendations to improve the efficiency and consistency of the process.

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provides an additional $26.7 billion in highway spending to the states.[15] FHWA is taking steps to oversee the increased spending by directing its field offices to revise their existing annual plans so that they address risks associated with delivering these projects. Field offices were required to identify and prioritize their primary risks and submit their plans to FHWA's field office directors by late March 2009. On the basis of these efforts, in April 2009, FHWA issued a risk management framework identifying eight key risks in implementing the Recovery Act, including

[14]DOT's Disadvantaged Business Enterprise (DBE) program is designed to remedy the effects of current and past discrimination against small businesses owned and controlled by socially and economically disadvantaged individuals and to foster equal opportunity in transportation contracting. Federal law generally requires DOT to ensure that at least 10 percent of the funds authorized for the highway and transit financial assistance programs be expended with DBEs.

[15]The Recovery Act directs GAO to conduct bimonthly reviews on the use of funds by selected states and localities, among other things. We have recently completed the first review, which examined a core group of 16 states, the District of Columbia, and selected localities. See GAO, *Recovery Act: As Initial Implementation Unfolds in States and Localities, Continued Attention to Accountability Issues Is Essential*, GAO-09-580 (Washington, D.C.: Apr. 23, 2009) and *Recovery Act: States' and Localities' Current and Planned Uses of Funds While Facing Fiscal Stresses*, GAO-09-829 (Washington, D.C.: July 8, 2009). We expect to track the activities of these 16 states and the District of Columbia over the next few years to provide an ongoing longitudinal analysis of the use of Recovery Act funds.

risks associated with weak internal controls,[16] which may lead to the payment of ineligible costs, and difficulty in meeting the public's expectations for stimulating economic recovery and delivering transportation projects that yield long-term value. The framework also includes eight risk mitigation strategies, including reviews of previously identified risks in all states and providing guidance on the Recovery Act to funding recipients.

FHWA Is Not Fully Tracking Risk Mitigation Activities and Associated Recommendations

FHWA's field offices are not fully tracking risk mitigation activities and associated recommendations. FHWA field offices often initiate reviews of state or local agency processes in response to identified risks. These reviews can result in recommendations. Standards for internal control state that agencies should have policies and procedures that help ensure that actions are taken to address risks and enforce recommendations.[17] Also, monitoring of internal control should include policies and procedures for ensuring that the findings of reviews are promptly resolved. However, we found that only 1 of the 5 field offices that we visited had information about both its own progress in addressing risks and its state's progress in resolving related review recommendations. Also, in a 2008 survey of its 52 field offices, FHWA found that of the 29 field offices that responded to the survey, 7 did not have a system for tracking review recommendations. Of the 22 field offices with tracking systems, FHWA found 8 different systems in use, which could make it difficult to aggregate review recommendation tracking information at the national level.

To improve the situation, FHWA plans to develop an information system to track states' progress in addressing review recommendations. FHWA has not yet decided whether to require all field offices to use the system. Also, FHWA has not yet determined whether it will develop an information system for its field offices to track their own progress in addressing risks. Without complete and consistent tracking information, it is difficult to

[16] Internal control is an integral component of an organization's management that provides reasonable assurance that the following objectives are being achieved: effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations. Internal control also serves as the first line of defense in safeguarding assets and preventing and detecting errors and fraud.

[17] GAO, *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

aggregate national-level information from the field offices and to ensure that risks and related review recommendations have been addressed.

FHWA Has Made Limited Progress in Meeting SAFETEA-LU's Requirements for Cost Estimating

FHWA has made limited progress in meeting SAFETEA-LU's requirements to develop minimum standards that states must follow when estimating project costs, and to periodically evaluate states' practices for estimating project costs. Although FHWA field offices are doing little to periodically evaluate states' cost estimating practices overall, FHWA has established a process for evaluating the credibility of states' cost estimates for major projects.

FHWA Has Made Limited Progress in Developing Minimum Standards for Estimating Project Costs

FHWA has made limited progress in meeting SAFETEA-LU's requirement to develop minimum standards that states must follow when estimating project costs. In 1997, we reported that project cost estimates typically had not been reliable predictors of project costs or financing needs.[18] Although FHWA has efforts under way, it is unlikely to issue standards until 2011, at the earliest. To meet the SAFETEA-LU requirement, the agency is participating in AASHTO's effort to develop cost estimating guidance for states. As part of this effort, AASHTO sponsored the development of such guidance by the National Cooperative Highway Research Program, which was completed in 2007.[19] AASHTO is developing additional cost estimating guidance; an AASHTO official who is helping to coordinate this effort told us that he expects the guidance to be completed in the latter half of 2010. FHWA's Director of Program Administration told us that once the guidance is complete, FHWA plans to issue a regulation adopting as its minimum standards for cost estimating either the guidance developed by NCHRP, the additional guidance being developed by AASHTO, or both. This would take more time. For instance, the official provided us with an example in which it took about 18 months from the time AASHTO issued guidance until FHWA regulation took effect.

[18] GAO/RCED-97-47.

[19] Stuart Anderson, Keith Molenaar, and Cliff Schexnayder, *Guidance for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction* (Washington, D.C.: National Cooperative Highway Research Program, 2007), prepared for the Transportation Research Board of the National Academies.

FHWA Has Not Established a Process for Evaluating States' Cost Estimating Practices

FHWA has not established a process to meet SAFETEA-LU's requirement that it periodically evaluate states' cost estimating practices. FHWA's Director of Program Administration told us that the agency has not established such a process because it has been focused on developing minimum cost estimating standards.

Four of the five FHWA field offices that we visited were doing little to periodically evaluate states' cost estimating practices. For example, one field office has not recently evaluated states' cost estimating practices because, officials stated, most of the state's cost estimates that they evaluate before contracts are awarded for construction are reasonably accurate, in that they are close to the lowest bid received from bidders. However, estimates that are close to the lowest bid are not always a good indicator of sound cost estimating practices. As we reported in 1997, most of a project's cost growth can occur before a project goes to construction.[20] In addition, cost increases can also occur after a contract is awarded. Another field office is working with its state DOT to refine the state's cost estimating guidance, but the field office will not be formally evaluating the state's current practices as part of this effort. In 2008, however, one field office evaluated its state DOT's practices for documenting cost estimates, and it is conducting an evaluation of the state DOT's cost estimating practices to determine if they produce accurate and reliable estimates. Periodically evaluating states' cost estimating practices could help to enhance the credibility of states' cost estimates.

FHWA Has Established a Process for Evaluating the Credibility of States' Cost Estimates on Major Projects

Although FHWA field offices are doing little to periodically evaluate states' cost estimating practices overall, for major projects—those estimated to cost over $500 million—FHWA has established a process for evaluating the credibility of states' cost estimates. SAFETEA-LU requires sponsors of major projects to submit a financial plan that is based on detailed cost estimates to complete the project and on reasonable assumptions, as determined by FHWA. To help meet this requirement, FHWA evaluates states' cost estimates for major projects. We assessed FHWA's evaluations of cost estimates for two major projects—an expansion of 21 miles of a highway to a four-lane expressway in Wisconsin and an expansion of 11 miles of an expressway to a six-lane freeway in Colorado. We found

[20] GAO/RCED-97-47.

that, consistent with GAO's best practices for estimating project costs,[21] both of the evaluations involved conducting and documenting an analysis of risks and uncertainties related to the cost estimate.[22] These analyses (1) identified the effects on the estimate of changing assumptions about key cost drivers; (2) developed a probability distribution of the expected cost using a Monte Carlo simulation tool;[23] and (3) identified a point estimate, along with the probability that the actual cost will not exceed the point estimate.[24]

[21]GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

[22]The term risk and uncertainty refers to the fact that because a cost estimate is a forecast, there is always a chance that the actual cost will differ from the estimate. Recognizing the potential for error and deciding how best to quantify it is the purpose of a risk and uncertainty analysis.

[23]The term Monte Carlo simulation refers to a computer-based analysis that uses probability distributions for key variables, selects random values from each of the distributions simultaneously, and repeats the random selection over and over. Rather than presenting a single outcome—such as the mostly likely or average scenario—Monte Carlo simulations produce a distribution of outcomes that reflect the probability distributions of modeled uncertain variables.

[24]A point estimate is usually the most likely value for the cost estimate, given the underlying data.

FHWA's Guidance and Documentation for Reviews of State DOTs' Financial Management Systems and Practices Generally Meet Key Standards and Principles, but Lack Some Important Details

FHWA's guidance to its field offices on reviewing state DOTs' financial management systems and practices generally follows key federal standards and principles, but lacks specific steps and documentation in some key areas, such as improper payments, that could help improve oversight of state projects.[25] The Office of Management and Budget (OMB) has established standards and principles related to financial management systems in circulars on internal control, improper payments, financial systems, and audits of state and local governments.[26] To implement these circulars, FHWA has established a program in which its field offices conduct annual reviews of state DOTs designed to cover the following five areas: (1) a key financial process or system (e.g., reviewing states' procedures for recouping costs incurred on federal-aid highway projects), (2) improper payments, (3) unobligated balances on inactive projects, (4) findings reported pursuant to the Single Audit Act,[27] and (5) findings reported by the DOT Inspector General and GAO. FHWA's guidance to its field offices on how to conduct the reviews generally follows OMB's standards and principles in the circulars. However, the guidance sometimes does not provide enough direction about the specific steps that reviewers are supposed to complete to help ensure that the reviewer provides sufficient evidence to support the work performed and the reviewer's conclusions as required by generally accepted government auditing standards.[28] For example, in one of the five areas—improper

[25]The Improper Payments Information Act of 2002 defines improper payments as any payment that should not have been made or that was made in an incorrect amount (including overpayments and underpayments) under statutory, contractual, administrative, or other legally applicable requirements. The act includes any payment to an ineligible recipient, any payment for an ineligible service, any duplicate payment, payments for services not received, and any payment that does not account for credit for applicable discounts.

[26]OMB, Circular No. A-123 (revised), *Management's Responsibility for Internal Control* (Washington, D.C.: 2004); Circular No. A-123, Appendix C, *Requirements for Effective Measurement and Remediation of Improper Payments* (Washington, D.C.: Aug. 10, 2006); Circular No. A-127 (revised), *Financial Management Systems* (Washington, D.C.: Jan. 9, 2009); and Circular No. A-133 (revised), *Audits of States, Local Governments, and Non-Profit Organizations* (Washington, D.C.: June 27, 2003).

[27]See 31 U.S.C. §§ 7501-7507. Nonfederal entities that expend $500,000 or more a year in federal awards under more than one federal program are required by the Single Audit Act to undergo a single audit. The single audit replaces multiple grant audits with one audit of an entity as a whole. Single audits focus on the recipient's internal controls and its compliance with laws and regulations governing federal awards.

[28]GAO, *Government Auditing Standards, July 2007 Revision*, GAO-07-731G (Washington, D.C.: July 2007).

payments—the guidance does not require reviewers to identify the causes of improper payments and the actions taken to correct those causes, assess related information systems, and determine whether a plan has been developed to reduce the outstanding amount. Without requiring this information, FHWA is missing an opportunity to improve its oversight of state-managed projects.

The 10 field offices we assessed generally documented coverage of the required areas in their financial management reviews in 2008, when 5 of the field offices documented coverage of all five areas and 4 of the field offices documented coverage of four areas. This represents an improvement over 2006, when 7 of the field offices documented coverage of three areas, and the other 3 the field offices documented coverage of two areas. However, the field offices' documentation sometimes lacked information on the specific procedures performed or any issues identified by reviewers, as required by generally accepted government auditing standards.[29] A reason why the information is lacking is because the template that FHWA developed and that the field offices used to report the results of their reviews does not call for this information. As a result, it is more difficult for headquarters staff to monitor and follow up on field offices' and states' progress.

For the five field offices that we visited, we also assessed the field offices' tracking of states' progress in responding to recommendations from the field offices' reviews of state DOTs. The five field offices did not use consistent approaches to track states' progress. However, four of the five field offices had useful approaches for tracking states' progress on recommendations. For example, one field office conducted a follow-up review in 2008, which found that the state had addressed most findings from a 2007 review of local projects, and the field office also tracked the state's progress through written correspondence. Three other field offices periodically updated tracking sheets with specific information on actions that states have taken to address recommendations. In contrast, another field office also used a tracking sheet, but for most recommendations that had not yet been implemented, the status field in the database said either "mostly complete" or "ongoing," but did not provide any information on what steps have been taken to address the recommendations. The agencywide tracking system that FHWA plans to develop is partly intended to help improve the tracking of these recommendations.

[29] GAO-07-731G.

Financial Plans for Major Highway Projects Lack Information on Financing Costs

FHWA does not require states' financial plans for major highway projects to present an estimate of the projects' financing costs. FHWA's guidance on financial plans for major projects states that the plan should reflect the project's cost estimate and revenue sources and amounts and provide reasonable assurance that there will be sufficient financial resources available to implement and complete the project as planned. FHWA's guidance also states that financial plans are to provide information on immediate and long-term financial implications of projects, and to provide reasonable assurance that the project's impact on the state's transportation capital improvement program has been assessed. However, FHWA's guidance does not require, and states' plans generally do not present, an estimate of financing costs.

According to FHWA's Major Projects Team Leader, the agency does not require states to include an estimate of financing costs in the project's financial plan, in part because (1) financing costs are already reflected in statewide transportation planning documents and (2) accurately estimating financing costs for individual projects is difficult because states often fund multiple projects from a single bond issuance. However, while some uncertainty about a major project's financing cost is expected, and presenting estimates of financing costs for projects of all dollar amounts may be impractical, the costs of major projects can represent a significant cost to a state. These costs can, when combined with payments on the principal portion of the debt, consume large shares of future federal transportation funding, potentially impacting a state's transportation capital improvement program. For example, Maryland DOT officials provided us the estimated financing costs associated with the Intercounty Connector project, which are $1.4 billion, more than half as much as the $2.5 billion cost of designing and constructing the project. The financing costs are scheduled to be paid over a 34-year period, with annual payments on the portion of the debt repayable with future federal-aid highway funds scheduled to peak in 2010, requiring 14 percent of the federal-aid highway funds that Maryland is expected to receive that year.[30] While estimating a project's financing costs can be complicated due to market conditions and other factors that can change over time, without presenting an estimate of these costs, a financial plan may not be meeting its intended purposes of providing information on immediate and long-

[30]The project is funded by a combination of grant anticipation revenue vehicles (state issued bonds or notes repayable with future federal-aid), toll-backed bonds, state funds, and federal funds.

term financial implications of projects, and providing reasonable assurance that a project's impact on the state's transportation capital improvement program has been assessed.

Conclusions

FHWA has strengthened its oversight of the federal-aid highway program by making improvements to its risk management approach, implementing a process to evaluate the credibility of major project cost estimates, and issuing financial management review guidance to its field offices that generally follows OMB's standards and principles. The agency is targeting its resources by systematically analyzing risks that could have a significant impact on the federal aid highway program and developing response strategies. FHWA's evaluations of major project cost estimates assess, quantify, and document how risks and uncertainties could affect a project's cost. Also, FHWA's guidance on financial management reviews could help ensure that federal funds are used efficiently and effectively.

While FWHA has made substantial improvements, further progress in tracking risk mitigation activities, overseeing state cost estimates, providing guidance and documentation for financial management reviews, and including information in financial plans, would enhance its ability to ensure that states effectively manage and control the cost and schedule performance of federally aided projects. First, while FHWA plans to develop a new system for tracking states' progress in addressing review recommendations, it has not yet committed to requiring its field offices to use the planned system, nor has it determined whether it will develop an information system for its field offices to track its own progress in addressing risks. As a result, FHWA may not be able to fully ensure that identified risks to the federal-aid highway program are mitigated or detect broader trends or concerns across states. Second, because FHWA has made limited progress in meeting SAFETEA-LU's requirement to periodically review states' cost estimating practices, it cannot ensure that states' estimates are credible or that highway projects are effectively and efficiently managed. Third, while FHWA's guidance and documentation for reviews of state financial management systems and practices generally meet key standards and principles, requiring more information on the procedures reviewers should and do perform, such as identifying the causes of improper payments and the actions taken to correct those causes, would enhance the agency's ability to oversee these systems and practices. Finally, while financial plans for major projects are designed to provide reasonable assurance that sufficient financial resources will be available to complete a project, requiring states to present an estimate of the financing costs of major projects would help decision makers consider and make fully informed decisions about whether to approve the substantial investment of public funds that major projects require.

Because FHWA has actions under way to meet SAFETEA-LU's requirement to issue minimum standards that states must follow when estimating project costs, we are not making any recommendations in this area. However, to have the greatest impact on the quality of states' cost estimates, it will be important for FHWA to issue the standards in a timely manner and to ensure that the standards are consistent with our best practices for cost estimating. Some best practices, such as conducting and documenting an analysis of risks and uncertainties related to the cost estimate, could be costly and would not be appropriate for smaller-dollar projects if the anticipated benefit of the practice is exceeded by its anticipated cost.

Recommendations for Executive Action

To help ensure effective and efficient management and oversight of the federal-aid highway program, we recommend that the Secretary of Transportation direct the Administrator, FHWA, to take the following five actions:

- Require all field offices to use the agency's planned new system for tracking states' progress in addressing FHWA's review recommendations.
- Develop the capability for all field offices to uniformly track the status of their efforts to mitigate risks to the federal-aid highway program.
- Develop and implement a process to periodically evaluate states' cost estimating practices.
- Supplement FHWA's guidance for reviewing improper payments by including information on the specific steps reviewers are supposed to complete, such as identifying the causes of improper payments and actions taken to correct those causes. In addition, enhance FHWA's reporting template for its reviews of states' financial management systems by requiring reviewers to document the specific procedures performed.
- For major projects, require states to present an estimate of financing costs in the project's financial plan.

Agency Comments

We provided a draft of this report to DOT for its review and comment. The department did not offer overall comments on the draft report, but it provided technical comments, which we incorporated as appropriate. DOT also stated it would consider the report's recommendations.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Transportation, the Director of the Office of Management and Budget, and other parties. The report will also be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staffs have any questions about this report, please contact me at (202) 512-2834 or herrp@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix II.

Phillip R. Herr
Director, Physical Infrastructure Issues

Appendix I: Scope and Methodology

To assist Congress in the upcoming reauthorization of the federal-aid highway program, we examined the Federal Highway Administration's (FHWA) implementation of several requirements in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), specifically its (1) oversight of states' project delivery systems, in particular, its use of a risk management approach to allocate their oversight resources; (2) efforts to develop minimum standards for states to follow when estimating project costs, and to periodically evaluate states' cost estimating practices; and (3) efforts to review elements of states' financial management systems and practices that affect projects. We also examined FHWA's policy on presenting an estimate of financing costs in financial plans for major projects. To address these objectives, we reviewed key agency and state departments of transportation (DOT) documents and relevant regulations and legislation. We conducted interviews with FHWA, and state DOT officials and representatives from the American Association of State Highway and Transportation Officials (AASHTO). In addition, we observed a risk management training class available to FHWA staff. We also visited five FHWA field offices—specifically Colorado, Delaware/Maryland, Pennsylvania, Washington, and Wisconsin—which were selected to cover a range of sizes in terms of federal-aid dollars and include some offices that were overseeing a major project. Because we used a nonprobability sample, information obtained from the field offices that we visited cannot be generalized to all field offices. In addition, we assessed financial management reviews in five randomly selected field offices, specifically Arizona, Arkansas, Connecticut, Idaho, and Iowa.

To evaluate FHWA's risk-based approach to oversight, we reviewed a report from DOT's Inspector General (IG) on FHWA's risk management approach and interviewed a DOT IG official to obtain information on FWHA's progress in addressing the report's recommendations. We reviewed FHWA's risk management guidance and training materials and compared them with GAO's internal risk management guide for analysts.[1] In addition, we reviewed FHWA field office risk assessments, annual performance plans and other related planning documents, and field office documentation of risk and recommendation tracking efforts. To evaluate FHWA's efforts related to cost estimating, we assessed FHWA cost estimating guidance and its evaluations of states' cost estimates for two major projects against criteria in GAO's cost estimating and assessment

[1]GAO, *Risk Management: A GAO Analysts' Guide.*

guide.[2] We also assessed draft cost estimating guidance being developed by AASHTO against criteria in GAO's guide. We also reviewed FHWA field office efforts to periodically assess states' cost estimating practices by conducting interviews with FHWA headquarters and field office staff and reviewing field office reports related to state DOT cost estimating practices. To assess FHWA's reviews of financial management systems and practices, we reviewed FHWA's guidance and financial management work papers from field offices and compared them with relevant federal standards and principles established by the Office of Management and Budget in circulars on internal control, improper payments, financial systems, and audits of state and local governments; and with generally accepted government auditing standards. We also assessed whether the field offices' financial management work papers covered all of the areas required by FHWA's guidance and reviewed field offices' efforts to track related recommendations. Finally, to examine FHWA's policy on presenting financing costs in financial plans for major projects, we reviewed FHWA's financial plan guidance and estimates of financing costs on a major project. We also interviewed a state official to obtain views on presenting estimates of financing costs in major projects' financial plans.

We conducted this performance audit from June 2008 through July 2009 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.

[2]GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

Appendix II: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

In addition to the individual named above, Steve Cohen, Assistant Director; Daniel Cain; Jennifer Echard; Fred Evans; Colin Fallon; Kathleen Gilhooly; David Goldstein; Jason Lee; Flavio Martinez; Amanda Miller; Karen Richey; Amanda Seese; Laura Shumway; and Jack Warner made key contributions to this report.

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