

GAO

Report to the Chairman, Committee on
Transportation and Infrastructure, House
of Representatives

January 2005

FEDERAL-AID HIGHWAYS

FHWA Needs a Comprehensive Approach to Improving Project Oversight



G A O

Accountability * Integrity * Reliability



Highlights of [GAO-05-173](#), a report to the Chairman, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

The federal-aid highway program provides over \$25 billion a year to states for highway and bridge projects, often paying 80 percent of these projects' costs. The federal government provides funding for and oversees this program, while states largely choose and manage the projects. Ensuring that states effectively control the cost and schedule performance of these projects is essential to ensuring that federal funds are used efficiently.

We reviewed the Federal Highway Administration's (FHWA) approach to improving its federal-aid highway project oversight efforts since we last reported on it in 2002, including (1) FHWA's oversight-related goals and performance measures, (2) FHWA's oversight improvement activities, (3) challenges FHWA faces in improving project oversight, and (4) best practices for project oversight.

What GAO Recommends

GAO recommends that FHWA link its activities and staff expectations to its oversight goals and measures, develop an overall plan for its oversight activities tied to goals and measures and supported in workforce plans, define the role of project managers, and develop the capability to track project costs to identify problems and transfer lessons learned. DOT generally agreed with this report's facts and conclusions.

www.gao.gov/cgi-bin/getrpt?GAO-05-173.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Kate Siggerud at (202) 512-6570 or siggerudk@gao.gov.

FEDERAL-AID HIGHWAYS

FHWA Needs a Comprehensive Approach to Improving Project Oversight

What GAO Found

FHWA has made progress in improving its oversight efforts since 2002, but it lacks a comprehensive approach, including goals and measures that guide its activities; workforce plans that support these goals and measures; and data collection and analysis efforts that help identify problems and transfer lessons learned. FHWA's 2004 performance plan established, for the first time, performance goals and outcome measures to limit cost growth and schedule slippage on projects, but these goals and measures have not been effectively implemented because FHWA has not linked its day-to-day activities or the expectations set for its staff to them, nor is FHWA fully using them to identify problems and target its oversight.

FHWA undertook activities in response to concerns raised about the adequacy of its oversight efforts that have both promising elements and limitations. For example, while FHWA now assigns a project oversight manager to each major project (generally projects costing \$1 billion or more) and identified skills these managers should possess, it has not yet defined the role of these managers or established agencywide performance expectations for them. While FHWA issued guidance to improve cost estimating and began collecting information on cost increases, it still does not have the capability to track and measure cost growth on projects. Finally, although FHWA received direction to develop a more multidisciplinary workforce to conduct oversight, it has not fully incorporated this direction into its recruiting and training efforts.

FHWA faces challenges to improving its oversight that are in large part rooted in the structure of the federal-aid highway program and in FHWA's organization and culture. As such, they may be difficult to surmount. For example, because the program does not link funding to states with the accomplishment of performance goals and outcome measures, it may be difficult for FHWA to define the role and purpose of its oversight. Also, FHWA's decentralized organization makes it difficult to achieve a consistent organizational vision. Human capital challenges affecting much of the federal government have affected FHWA, particularly in its need to transform its workforce to meet its evolving oversight mission. FHWA faces an increased oversight workload in the years ahead as the number of major projects grows and if provisions Congress is considering to increase FHWA's responsibilities become law. Questions exist about FHWA's ability to effectively absorb these new responsibilities, overcome underlying challenges, and improve its oversight.

We identified selected best practices that could help FHWA develop a framework for a comprehensive approach to project oversight. These include establishing measurable goals to objectively and quantifiably assess progress, making oversight managers accountable for the effective implementation of these goals, providing professional training, and collecting and transferring lessons learned.

Contents

Letter

Results in Brief	1
Background	4
FHWA Established Some Oversight Goals and Measures but Has Not Effectively Implemented Them	7
FHWA's Oversight Activities Have Promising Elements and Limitations	15
FHWA Faces Challenges to Improving Oversight	21
Best Practices Can Help Improve Progress and Address Challenges to Improving Project Oversight	32
Conclusions	38
Recommendations	42
Agency Comments	43

Appendixes

Appendix I: Scope and Methodology	45
Appendix II: FHWA FY 2004 Major Project Team Work Plan Summary	48
Appendix III: GAO Contacts and Staff Acknowledgments	50
GAO Contacts	50
Staff Acknowledgements	50

Table

Table 1: Types of Projects Receiving FHWA Oversight versus State Oversight	11
--	----

Figures

Figure 1: Stages of a Highway or Bridge Project and State and FHWA Roles and Approval Actions	10
Figure 2: Goals and Associated Measures Articulated In FHWA's 2004 Performance Plan	17

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
DOT	Department of Transportation
FHWA	Federal Highway Administration
FMIS	Financial Management Information System
FTA	Federal Transit Association
GPRA	Government Performance and Results Act of 1993
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
OIG	Office of Inspector General
OMB	Office of Management and Budget
PDP	professional development program
TEA-21	Transportation Equity Act for the 21st Century

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States Government Accountability Office
Washington, D.C. 20548

January 31, 2005

The Honorable Don Young
Chairman, Committee on Transportation and Infrastructure
House of Representatives

Dear Mr. Chairman:

The federal-aid highway program provides over \$25 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 and environmental review, as well as the time spent in the design and construction phases. 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. In the longer term, broader fiscal challenges face the nation, including federal and state budget deficits and a fiscal crisis looming as the baby boom generation retires, causing mandatory commitments to Social Security and Medicare to consume a greater share of the nation's resources, squeezing funding available for domestic discretionary programs. Thus, ensuring that states effectively manage and control the cost and schedule performance of federally-aided projects, and that federal funds are used efficiently and effectively, is critical in light of these challenges.

The Federal Highway Administration (FHWA), under the Department of Transportation (DOT), is responsible for overseeing the federal-aid highway program through its headquarters in Washington, D.C., and division offices located in every state, the District of Columbia, and Puerto Rico. To carry out this role, FHWA reviews and approves the transportation plans and environmental impact assessments that states periodically prepare, reviews and approves states' property acquisition activities; and 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) reviews of state management processes, also known as process reviews, to ensure that the states have adequate controls to effectively manage federally-assisted projects. FHWA also

enforces requirements for “major projects”—generally those projects estimated to cost over \$1 billion—such as reviewing and approving annual finance plans required by law for these projects.

We and others have raised concerns regarding FHWA’s oversight of the federal-aid highway program. For example, from 1997 to 2002, we highlighted several problems, including the lack of a link between FHWA’s oversight activities and its business goals; a lack of emphasis on FHWA’s part to ensuring that containing costs is an integral part of states’ project management; a lack of useful cost estimates, which typically have not been reliable predictors of the total costs or financing needs of projects; and a lack of information on the amount of and reasons for cost increases. In particular, we have highlighted the challenges that major, multibillion-dollar projects pose. These projects are very costly and complex—they require large commitments of public resources that may take several years to garner; can involve complicated financing arrangements; can be technically challenging to construct; and involve a wide range of social, environmental, land-use, and economic challenges before and during construction. To keep the projects on schedule and within budget, federal and state officials must carefully oversee their development, planning, and construction.

We also recognized actions Congress, DOT, and FHWA have taken to improve FHWA’s oversight in response to concerns raised about its efforts. For example, in 1998, Congress required that states submit to the Secretary of Transportation an annual finance plan for major projects, which was intended to help provide an advance warning system for increased costs for large transportation projects receiving federal funds. In 2001, FHWA took steps to improve its oversight of these major projects by, among other things, establishing a major projects team to coordinate and implement oversight policies for major projects and designating project oversight managers to oversee these projects. In addition, for its reviews of state management processes, FHWA also began to conduct more risk assessments to identify and prioritize risk areas and allocate resources.

FHWA will face an increased oversight workload in the years ahead if provisions Congress is considering become law and as the number of federal-aid projects grows. In 2003, DOT proposed legislation for the reauthorization of the Transportation Equity Act for the 21st Century (TEA-21) that would increase FHWA’s oversight responsibilities by requiring FHWA to annually review states’ financial management processes and to periodically review how states plan and manage projects. The legislation

would also extend certain oversight requirements that currently pertain only to major projects, to other large-dollar projects as well. This proposal was largely adopted in bills that were separately approved by the House and Senate in 2004, but which were not enacted before the adjournment of the 108th Congress. In addition, during the course of our review, the number of major projects FHWA is responsible for overseeing increased from 15 to 21, and that number is expected to nearly double to 40 in the next several years.

At your request, we reviewed FHWA's approach to improving its federal-aid highway project oversight efforts since 2002, including (1) FHWA's oversight-related performance goals and measures, (2) FHWA's oversight improvement activities, (3) challenges FHWA faces in improving project oversight, and (4) best practices for project oversight.

To determine FHWA's approach to improving its oversight efforts since 2002, the last time we reported on this issue, we evaluated the agency's strategic and performance plans, and supporting documents. Furthermore, we documented and analyzed the status of FHWA's various project oversight efforts. We interviewed officials at FHWA Headquarters and selected FHWA division offices, state departments of transportation, and others to document oversight implementation efforts and the challenges FHWA faces in improving its project oversight. We also reviewed FHWA's use of financial information from its Financial Management Information System (FMIS) to track and analyze trends in cost growth on projects. We did not independently assess the reliability of FMIS data as the Department's Inspector General has reported on weaknesses in FHWA's financial management and reporting processes, most recently in November 2004 as part of the annual audit of DOT's consolidated financial statements. In addition, our work focused primarily on FHWA's use of FMIS data for oversight purposes, rather than relying on FMIS data to support our findings and conclusions.

To provide information on project management best practices we conducted a literature search to identify best practices related to project oversight and evaluated their applicability to FHWA's oversight efforts. We conducted our work from August 2003 through December 2004 in accordance with generally accepted government audit standards. Appendix I provides the details of our scope and methodology.

Results in Brief

FHWA has made progress in improving its oversight efforts since 2002, but it lacks a comprehensive approach to project oversight, including oversight-focused goals and outcome measures that guide its activities; an overall plan for its oversight activities that responds to past concerns and is linked to these goals and measures; workforce planning efforts that support these goals and measures; and data collection and analysis efforts that identify problems, help target resources, and transfer lessons learned. FHWA's 2004 performance plan established, for the first time, performance goals and outcome measures to limit the magnitude of cost growth and schedule slippage for major projects, but these goals and measures have not been effectively implemented because FHWA has not linked the day-to-day oversight activities of its division offices or the expectations set for its staff to them. For example, none of the three division offices we visited that are currently overseeing major projects had established any link in its unit performance plan between its activities and FHWA's goal and measure to limit cost increases and schedule slippage on major projects. FHWA also established performance goals and measures to contain costs on projects other than major projects, but it is not yet using these goals to identify problems on a state-by-state or project-by-project basis in order to target its oversight activities. FHWA also uses cost and schedule estimates developed relatively late in a project's development—at the point at which the project is ready to go to construction—as a baseline for measuring its progress in limiting cost growth. However, by the time a project goes to construction, a public investment decision has effectively been made, as substantial funds will have been spent on designing the project and acquiring property, and much of the increases in a project's costs may have already occurred.

In response to concerns raised about the adequacy of its oversight efforts, FHWA undertook a series of oversight-related activities that have both promising elements and limitations. For example, FHWA now routinely assigns a project oversight manager to each major project. It established core competencies identifying the skills that project oversight managers should possess, which are to serve as a guide for selecting these managers. However, FHWA has not yet defined the role of project oversight managers or established agency-wide performance expectations for them. Instead, expectations for this position were developed locally at division offices, and none of the three division offices' expectations for oversight managers that we reviewed specifically tasked the manager with achieving FHWA's goals and measures to limit cost increases and schedule slippage. Without this link between performance expectations and goals, it is unclear how the

project oversight managers will improve oversight of major projects and what training and development are needed to achieve the desired performance. In another positive step, in June 2004, FHWA issued guidance to state transportation agencies to assist them in applying sound cost estimating practices, including guidance on developing more realistic early cost estimates. However, this guidance is voluntary and applies only to major projects, and it is too soon to tell whether it will be effective in improving the quality of estimates. DOT proposed legislation empowering FHWA to develop national standards for estimating project costs, which was included in the surface transportation reauthorization bills separately passed by the House and the Senate in 2004, but which were not enacted before the adjournment of the 108th Congress. FHWA also started tracking information on the cost growth of major projects, and it recently started developing some cost information on all federal-aid highway projects over \$10 million. However, FHWA still does not have the capability to track and measure cost growth on projects it oversees, which limits its ability to evaluate the reasons why cost growth occurs, identify problems and solutions, and transfer lessons learned. FHWA has also incorporated more risk assessments into its process reviews of state transportation agencies, but we found that some division offices are not using their risk assessments to guide their reviews. The DOT Inspector General recently reported that FHWA's risk assessments were voluntary and did not provide a systematic approach for assessing program risks throughout the agency. Finally, although FHWA received congressional-committee direction to restructure its workforce to develop a multidisciplinary approach to oversight, it has made limited progress in doing so, as it has not fully incorporated such an approach into its human capital planning, recruiting, or training efforts.

FHWA faces several challenges to improving its oversight—challenges rooted in the structure of the federal-aid highway program as well as FHWA's organization and culture—that may be difficult to surmount. The federal-aid highway program provides states with broad flexibility in the use of federal funds. Although DOT has articulated goals for the program such as improving safety and reducing the growth of traffic congestion, the program does not have the mechanisms to link funding levels with the accomplishment of specific performance-related goals and outcomes. As a result, it may be difficult for FHWA to define its role and the purpose of its oversight. FHWA's long-standing culture of partnership with the states also poses challenges; FHWA and state officials believe this partnership has helped to build trust and respect between the state agencies and FHWA and has resulted in projects being planned and built more efficiently and effectively. However, there is a potential downside—when a project

overseer becomes an active partner in a project, the arms-length, independent perspective that can be important to effective project oversight can be lost. Another challenge is FHWA's decentralized organization, which can make implementing a consistent oversight vision and strategies throughout FHWA difficult. Human capital challenges that affect much of the federal government have also affected FHWA's ability to improve its oversight, particularly in its need to transform its workforce and culture to support its evolving oversight mission. Finally, FHWA officials said that a challenge to improving oversight is that legislation passed in 1991 and 1998 has, in their view, sent mixed messages regarding FHWA's and states' roles, leading to confusion as to the extent of FHWA's authority and responsibilities over state-managed highway projects. Language in reauthorization legislation proposed by DOT and separately passed by the House and the Senate in 2004 but not enacted may help clarify FHWA's oversight role if it is reintroduced and enacted by the 109th Congress.

We identified selected best practices that are relevant to FHWA's efforts to improve project oversight through analyzing our past work on effectively managing and overseeing projects, as well as reports by the National Research Council, the Office of Management and Budget (OMB), and others. While some of these best practices are beginning to be reflected in FHWA's activities, as a whole, they could provide a framework for moving to a comprehensive approach to project oversight. The best practices we identified include (1) establishing measurable project oversight goals and communicating these goals down through all levels of the agency; (2) establishing project oversight manager roles, responsibilities, and accountability measures based on oversight goals; (3) providing professional training and a career path in oversight management; and (4) identifying and transferring lessons learned. Establishing measurable project oversight goals and communicating these goals down through all levels of an agency illustrates how an agency will execute its oversight mission and establishes what its oversight is designed to accomplish. Establishing oversight manager roles, responsibilities, and accountability measures based on oversight goals links efforts to goals and makes managers accountable for proper project oversight. Providing professional training in oversight management could ensure that managers develop the skills necessary for conducting their oversight activities. Providing a career path would allow project managers to develop their abilities as they progress through increasingly challenging assignments. Identifying lessons learned from the successes and setbacks that occur on projects—and

transferring those lessons to other projects—can prevent mistakes from being repeated and promote improved oversight.

FHWA will face an increased oversight workload in the years ahead if provisions Congress is considering become law and as the number of federal-aid projects grows. Given the limitations present in FHWA's oversight approach today, questions exist about its ability to effectively absorb new responsibilities and to improve its oversight efforts over federal-aid highway projects in the years ahead. Moreover, absent a comprehensive approach, FHWA is unlikely to overcome the structural, organizational, and cultural challenges it faces and to fully address the concerns raised about the adequacy of its oversight efforts. To address these limitations, we are recommending that FHWA link its day-to-day activities and the expectations set for its staff to its goals and outcome measures; develop an overall plan for its oversight initiatives that is tied to its oversight-related goals and measures; improve the use and performance of project oversight managers by centrally defining their role and responsibilities; and develop the capability to track and measure costs over the lives of projects to identify problems, help target resources, and transfer lessons learned.

We provided a draft of this report to DOT and met with FHWA officials, including the Deputy Administrator, to obtain their comments on the draft. FHWA generally agreed with the facts and conclusions in the report and our characterization of the challenges FHWA faces in improving its project oversight. FHWA officials emphasized that although we highlighted potential drawbacks associated with both its culture of partnership with the states and its decentralized organization, this partnership and organization are also major strengths of the federal-aid highway program that will allow the agency to absorb potential new responsibilities, help overcome challenges, and improve program oversight in the future through a more comprehensive approach. FHWA officials did not take a position on our recommendations, but they stated that they would be taking them under advisement. They also suggested some technical and clarifying comments that we incorporated into the report as appropriate.

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, including highways, transit, highway safety, research, and motor carrier programs. In

1998 Congress enacted TEA-21, which authorized \$172.4 billion for the federal-aid highway program from fiscal years 1998 through 2003. The program expired on September 30, 2003, and it has been extended by six short-term extensions, the most recent extending the program until May 31, 2005. During the 108th Congress, both the House and Senate approved separate legislation to reauthorize the federal-aid highway program; however, the reauthorization legislation was not been enacted before the adjournment of the 108th Congress. The bill approved by the House authorized \$226.3 billion for the federal-aid highway program for fiscal years 2004 through 2009, an increase of about 31 percent over TEA-21, while the bill approved by the Senate authorized \$256.4 billion, an increase of about 49 percent.¹ Because both bills contained funding increases, it is likely that the number of federal-aid highway projects will rise in the next several years.

FHWA administers the federal-aid highway program and distributes most highway funds to the states through annual apportionments established by statutory formulas contained in law. Once FHWA apportions these funds, they are available to be obligated for construction, reconstruction, and improvement of highways and bridges on eligible federal-aid highway routes and for other purposes authorized in law. 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.² While FHWA administers the program, the responsibility for choosing projects generally rests with state departments of transportation and local planning organizations. The states have considerable discretion in selecting specific highway projects and in determining how to allocate available federal funds among the various projects they have selected. For example, section 145 of title 23 of the United States Code describes the federal-aid highway program as a federally-assisted state program and provides that the federal authorization of funds, as well as the availability of federal funds for expenditure, shall not infringe on the states' sovereign right to determine the projects to be federally financed.

¹S. 1072, 108th Cong. §1101 (2004); and H.R. 3550, 108th Cong., §1101 (2004).

²The 1 million miles of roads eligible for federal aid accounted for about 85 percent of the vehicle miles traveled on the nation's roadways in 2002. The 3 million miles of roads that are generally ineligible are functionally classified as local roads or rural minor collectors.

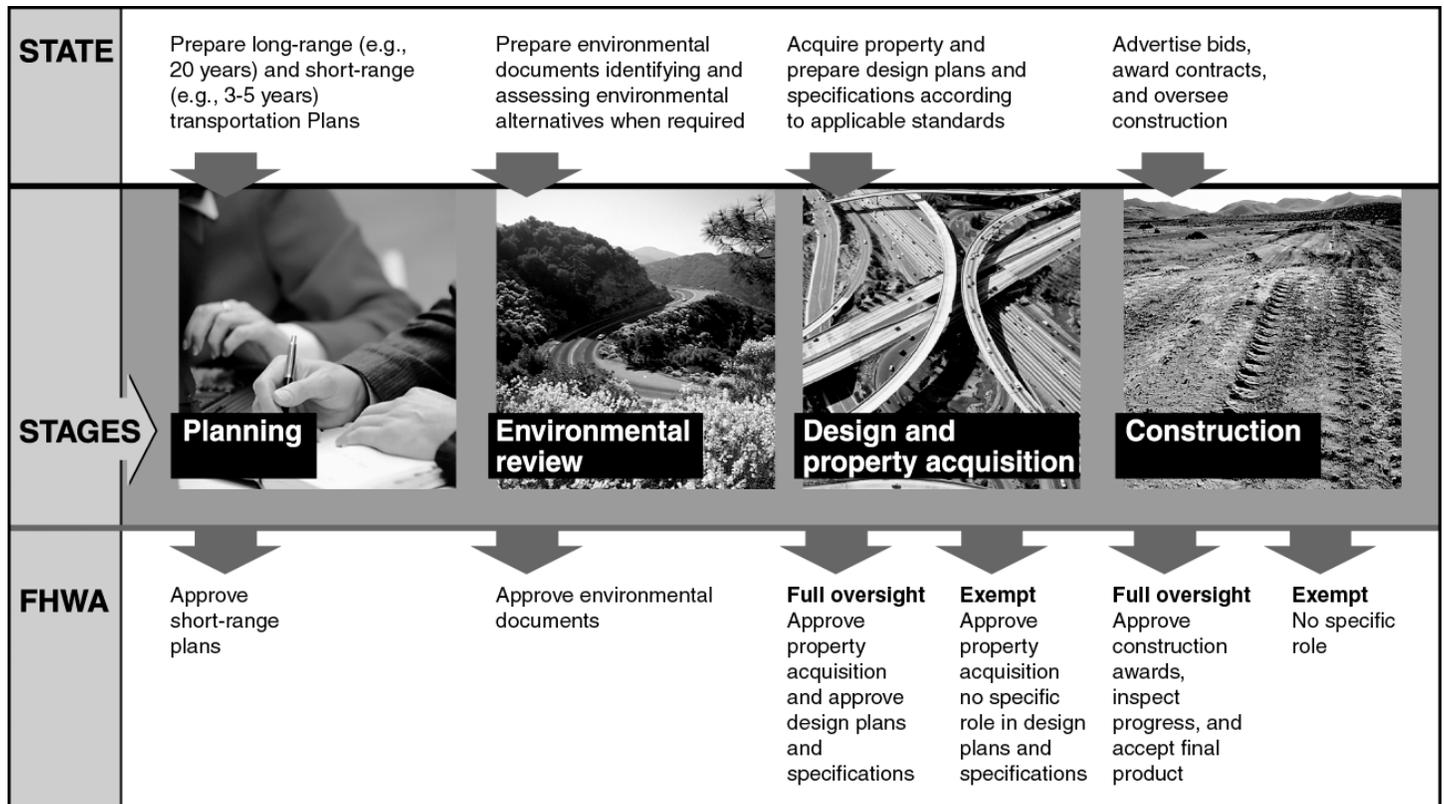
A highway or bridge construction or repair project usually has four stages: (1) planning, (2) environmental review, (3) design and property acquisition, and (4) construction. FHWA reviews and approves long-term and short-term state transportation plans and programs, environmental documents,

and the acquisition of property for all highway projects.³ 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. The last two authorizations, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and TEA-21, devolved an increasing amount of responsibility to the states. 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.

The stages of a highway or bridge project and the corresponding state role and FHWA approval actions are shown in figure 1.

³Specifically, FHWA approves state short-term transportation plans 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.

The types of projects for which FHWA exercises full oversight as compared with state oversight are shown in table 1.

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

Type of project	Mileage	Percent of federal highway funds obligated in 2002	Design and construction oversight	Exceptions
Interstate System	47,000	12	FHWA oversight	Certain types of projects, or projects below a dollar threshold, where FHWA and state determine state oversight is appropriate
National Highway System, non-Interstate routes	115,000	45	State may assume oversight	State or FHWA determines state oversight is not appropriate
Federal-aid highways off the National Highway System	798,000	42	State shall assume oversight	State determines state oversight is not appropriate

Source: GAO analysis.

According to FHWA, the agency retains the responsibility to oversee all federally-aided highway and bridge projects, including projects for which FHWA does not exercise oversight over the design and construction phases. FHWA conducts oversight of state transportation programs through a variety of means, including process reviews—reviews of state management processes to ensure that states have adequate controls to effectively manage federally-assisted projects. States and FHWA execute stewardship and oversight agreements to define their respective oversight responsibilities.

TEA-21 contains an additional oversight requirement for so-called “major projects”—generally those estimated to cost at least \$1 billion. Since TEA-21 was enacted in 1998, states must submit finance plans to DOT annually for such projects, based on detailed estimates of the costs to complete the project and on reasonable assumptions about future increases in such costs. FHWA developed guidance that requires states to include in these finance plans a total cost estimate for the project, adjusted for inflation and annually updated; estimates about future cost increases; a schedule for completing the project; a description of construction financing sources and revenues; a cash flow analysis; and a discussion of other factors, such as

how the project will affect the rest of the state's highway program. FHWA approves these plans as a condition of federal aid. As of November 2004, 11 of the 21 current major projects had finance plans. Approved finance plans will be required for the other projects prior to FHWA authorizing federal funds for construction.⁴ FHWA forecasts that another 19 major projects, estimated to cost from \$34 billion to \$60 billion, will be starting over the next several years and will also require finance plans.

Over the past several years, we and others have identified problems with FHWA's oversight of major projects and other large highway and bridge projects. 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.⁵ We found, however, on many of the projects for which we could obtain information, that costs had increased, sometimes significantly, and that several factors accounted for the increases. In addition, initial cost estimates were not reliable predictors of a project's total cost or financing needs because they were developed at the environmental review stage, and their purpose was to compare project alternatives, not to develop reliable cost estimates. We further reported that cost containment was not an explicit statutory or regulatory goal of FHWA's oversight; therefore, the agency had done little to ensure that cost containment was an integral part of the states' project management. In our May 2002 testimony before the Highways, Transit, and Pipelines Subcommittee of your Committee, we reported that FHWA had begun to improve its oversight by implementing Congress' finance plan requirements for major projects and introducing risk-based decision making into its oversight of states' processes on other projects.⁶ However, we also reported that FHWA had not yet developed performance goals or measurable outcomes linking its oversight activities to its business goals, and that goals and strategies for containing costs could improve accountability and make cost containment an integral part of how states manage projects over time. Furthermore, we stated that opportunities existed for improving the quality of cost estimating and

⁴A finance plan has not been prepared for one major project that is nearing completion, because it predates the requirement for these plans.

⁵GAO, *Transportation Infrastructure: Managing the Costs of Large-Dollar Highway Projects*, [GAO/RCED-97-47](#) (Washington, D.C.: Feb. 27, 1997).

⁶GAO, *Transportation Infrastructure: Cost and Oversight Issues on Major Highway and Bridge Projects*, [GAO-02-702T](#) (Washington, D.C.: May 1, 2002).

developing reliable and accurate information on the extent and nature of projects' cost performance to help direct federal oversight efforts. Our work identified several options for enhancing the oversight of major projects. Reports by DOT's Office of Inspector General, as well as reviews by state audit and evaluation agencies, have also shown that the escalating costs and management of major projects continue to be a problem. For example, the Inspector General has issued several reports on FHWA's oversight and stewardship of major projects, such as the Central Artery/Tunnel project in Massachusetts and the Woodrow Wilson Bridge in Virginia and Maryland. More recently, the Inspector General reported signs of improvement in FHWA's stewardship over major projects but identified improvements needed in eight areas, including developing more reliable cost estimates, managing project schedules better, strengthening efforts to prevent and detect fraud, and refocusing FHWA's efforts on project management and financial oversight.⁷

Partly in response to concerns that we and others have raised, in addition to the provisions Congress enacted in TEA-21, DOT also took further action. In 2000 the Secretary of Transportation established a task force to review oversight mechanisms and processes for major transportation projects across DOT. Among other things, the task force recommended that DOT improve the skills and qualifications of staff overseeing major projects and conduct more rigorous financial reviews of such projects. Although DOT did not formally implement the task force's recommendations, FHWA responded to the task force report by establishing a major projects team in Washington, D.C., to assist FHWA's division offices in reviewing financial plans and overseeing major projects and by assigning project oversight managers to each of the major projects. In addition, in 2003, DOT proposed new legislation as part of its TEA-21 reauthorization proposal requiring that (1) states submit a project management plan as well as an annual financial plan for any project with an estimated total cost of \$1 billion or more or any other project at the discretion of the Secretary; (2) states develop financial plans for any project receiving over \$100 million in federal funds; (3) FHWA perform annual reviews of state transportation programs' financial management and periodic reviews of state project delivery systems for planning and managing projects; and (4) DOT develop minimum standards for estimating project costs and perform periodic reviews of state practices

⁷*Management of Cost Drivers on Federal-aid Highway Projects*, Statement of the Honorable Kenneth H. Mead, Inspector General, U.S. Department of Transportation, May 8, 2003.

for estimating costs and awarding contracts. This proposal was largely adopted in bills that were separately approved by the House and the Senate in 2004 but that were not enacted before the adjournment of the 108th Congress.

To meet the requirements of the Government Performance and Results Act of 1993 (GPRA), DOT establishes goals and outcome measures for the programs under its jurisdiction, including the federal-aid highway program, through its strategic and performance plans. GPRA requires agencies to complete strategic plans in which they define their missions, establish outcome-oriented goals, and identify the strategies that will be needed to achieve those goals. GPRA also requires agencies to prepare annual performance plans to articulate goals for the upcoming fiscal year that are aligned with their long-term strategic goals. The establishment of goals and measures is a valuable tool for guiding an agency's strategies and resource allocations and for establishing accountability for the outcomes of its day-to-day activities. As our prior work has shown, measuring performance allows organizations to track the progress they are making toward their goals and gives managers crucial information on which to base their organizational and management decisions. When an agency's day-to-day activities are linked to outcome measures, these measures can create powerful incentives to influence organizational and individual behavior. In prior work, we found that leading agencies that successfully link their activities and resources also seek to establish clear hierarchies of performance goals and measures. Under these hierarchies, an agency links the goals and outcome measures for each organizational level to successive levels and ultimately to the agency's strategic goals. Without this link, managers and staff throughout the organization will lack straightforward roadmaps showing how their daily activities can contribute to attaining organization wide strategic goals.⁸

⁸GAO. *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118 (Washington, D.C.: June 1, 1996).

FHWA Established Some Oversight Goals and Measures but Has Not Effectively Implemented Them

FHWA established measurable, outcome-oriented goals and measures related to cost and schedule performance for the first time in its 2004 performance plan, but FHWA has not effectively implemented these goals and measures in order to improve oversight. Specifically, FHWA has not linked its day-to-day oversight activities to its goals for major projects, and it has not yet used its goals and measures for nonmajor projects to examine the performance of states or particular projects. FHWA also uses estimates developed relatively late in a project's development as its baseline for measuring its performance on achieving cost and schedule goals; thus, it does not task itself with controlling cost and schedule slippage during the early stages of a project's development.

FHWA Recently Established Goals and Measures

In December 2000, DOT issued a task force report concluding that a significant effort was needed to improve the oversight of major projects and recommending that DOT incorporate goals for its oversight efforts into its performance plans as well as into the plans of FHWA.⁹ In 2002, we reported that FHWA had not yet developed performance goals or measurable outcomes linking its oversight activities to its business goals and that goals and strategies for containing costs could improve accountability and make cost containment an integral part of how states manage projects over time.¹⁰

FHWA has made some improvements over the past several years in developing goals and performance measures related to cost and schedule performance of federal-aid highway projects. In its fiscal year 2002 performance plan, FHWA included a strategic goal of organizational excellence that had among its many strategic objectives the aim to improve organizational performance. Since that time, from fiscal year 2003 to fiscal year 2005, FHWA's performance plans have specifically identified under the organizational excellence heading a general oversight goal to improve project oversight and stewardship so as to realize more cost efficient federal-aid funds administration and project management and more effective use of funds in terms of return on investment. In its fiscal year 2004 performance plan, DOT for the first time established goals and

⁹Report of the ONE DOT Task Force on Oversight of Large Transportation Infrastructure Projects; December 2000.

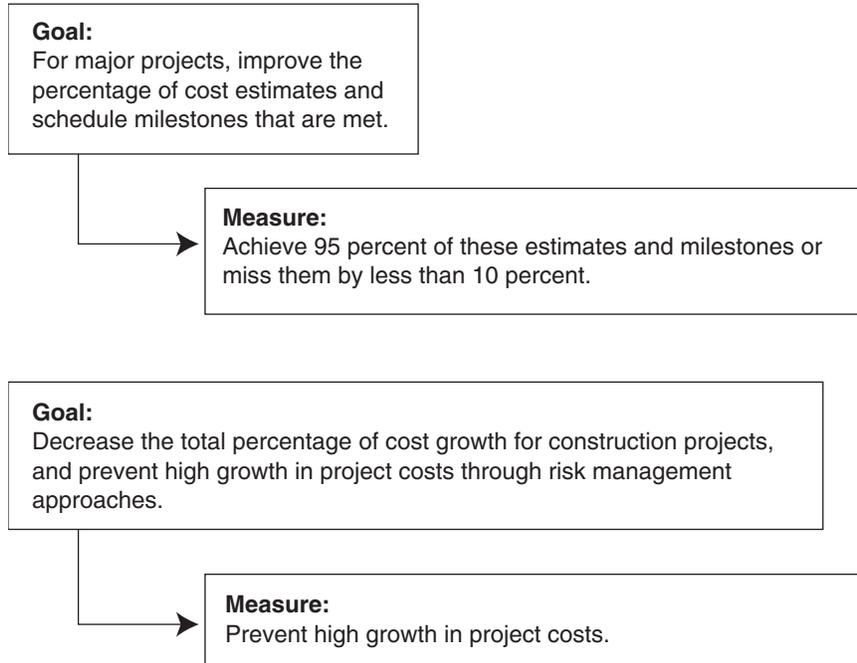
¹⁰GAO-02-702T.

outcome measures specifically related to achieving cost and schedule targets for its transportation projects.¹¹ FHWA incorporated these goals and measures into its performance plan for highway projects, establishing, for the first time, goals and measures for major projects that are outcome oriented and measurable and clearly define containing project costs and schedules as an integral part of FHWA's oversight mission. Figure 2 shows the goals and associated measures articulated in FHWA's fiscal year 2004 performance plan.¹²

¹¹Between fiscal years 2001 and 2003 FHWA did have an outcome measure under the organizational excellence goal to reduce unexpended balances. However, this measure did not specifically relate to cost and schedule targets on transportation projects. Unexpended balances are the annual amount of federal-aid funds obligated but not expended on projects of \$1 million or more and with no billing activity for more than a year.

¹²For FY 2005, FHWA made its measure to prevent high growth in project costs more specific by adding that the total percentage of cost growth for construction projects will be less than 10 percent above the original estimate on construction projects over \$10 million.

Figure 2: Goals and Associated Measures Articulated In FHWA's 2004 Performance Plan



Source: FHWA's 2004 Performance Plan.

FHWA Has Not Effectively Implemented its Goals and Measures

While linking day-to-day activities to goals and measures is an important element of implementing goals and measures by ensuring that they are being used as a framework to guide the activities, we found no evidence that FHWA has linked the day-to-day activities of its division offices to its goal and measure for major projects. In our visits to the three division offices that were overseeing a major project, we found a lack of documented goals, strategies, or measures showing how the division offices' activities supported and furthered the goals and measures articulated in FHWA's 2004 performance plan. While each division office had developed its own individual unit fiscal year 2004 performance plan, there was no link in these plans between the division offices' activities and FHWA's goal and measure for major projects: that is, to meet 95 percent of schedule milestones and cost estimates for major projects or to miss them

by less than 10 percent.¹³ Furthermore, in these three division offices, the project oversight managers were not specifically tasked, as part of their duties and responsibilities, with implementing or furthering the articulated cost and schedule performance goals for major projects.

This absence of a link between activities and goals and measures was in noticeable contrast to the link that the division offices had established between their activities and the three areas of work that FHWA has designated as its “vital few” priorities. FHWA’s vital few priorities, which consist of safety, congestion mitigation, and environmental stewardship and streamlining, are areas that FHWA has determined are key priorities and that it accordingly highlights in its performance plans as areas where the agency has identified performance gaps that must be addressed if FHWA is to be successful. Perhaps in line with this emphasis, FHWA has developed a better link between its division offices’ activities related to these vital few priorities and its goals related to these vital few priorities. For example, all seven of the division offices we visited had unit plans that linked their activities to all three of FHWA’s vital few priorities. This link was established through listing specific unit-level activities and measures that were designed to meet unit goals that mirrored the national performance plan’s goals for its vital few priorities. For example, for the vital few priority of safety, FHWA’s fiscal year 2004 performance plan set a performance goal of reducing highway fatalities to no more than 1.38 per 100 million vehicle miles traveled. The fiscal year 2004 performance plan for one division office tasked itself with five performance objectives to address this national goal, including such objectives as improving accident rates involving roadway departures, increasing the capability of FHWA and state engineers in highway safety design, and reducing pedestrian fatalities.¹⁴ One or more division-level performance measures and several specific activities were identified for each of these five division objectives, and performance expectations set for key division staff identified which of these activities they were responsible for performing.

In addition to not linking its activities to its goal for major projects, FHWA has also not yet used its goals and outcome measures to help it identify and

¹³Four of the division offices we visited were not at the time overseeing a major project; therefore, the major project goal and measure did not apply to their responsibilities at that time.

¹⁴The other two objectives were to increase the number of high-accident intersection improvement projects and to support the state’s safety plan.

correct problems on the vast majority of projects that are not considered major projects. In 2004, FHWA did not develop numerical goals or outcome measures related to nonmajor projects, nor did it assess the cost and schedule performance of projects on a state-by-state or project-by-project basis in order to gain a clear picture of whether certain states or projects have more cost or schedule overruns than others in order to target its oversight activities. Instead, FHWA officials told us that while FHWA's major projects team recently started developing this state-by-state information, FHWA relies on the division offices to monitor costs of individual contracts and take action as appropriate. However, these officials could not say with certainty whether their division offices were carrying out this monitoring function, or what kinds of corrective measures were being applied. FHWA officials also said that the agency relies on FHWA's division offices to execute formal oversight agreements with the states to ensure that they are working to control costs. However, none of the oversight agreements of the seven division offices we visited reflected an agreement between FHWA and the states to do this. As we concluded our review, FHWA officials stated that in response to issues we raised, FHWA would begin sharing information with its division offices and begin discussing appropriate solutions or actions the divisions can take to address incidences of cost growth.

For fiscal year 2005, FHWA made its cost-related goal for nonmajor projects more specific by adding the outcome measure that the total percentage of cost growth for all construction projects over \$10 million will be less than 10 percent above the estimated cost when the project went to construction. FHWA's preliminary information indicates that the agency is, in the aggregate, meeting its goal; however, sharing information with its division offices about variations in state contract costs could help FHWA target its oversight efforts. For example, FHWA's information also shows that about 1 in 5 of the 492 contracts approved for construction in fiscal year 2003 exceeded the 10 percent threshold in fiscal year 2004. One contract exceeded the threshold by 160 percent. Our analysis of FHWA's information also shows that some states may be more effectively controlling the costs of federal-aid highway contracts than others. For example, in one state, 6 of 9 contracts over \$10 million had exceeded the threshold, while in another state, all of the contracts were under the threshold. While opportunities exist for FHWA to use this information to better target its oversight efforts, it faces challenges in doing so in light of

weaknesses recently reported by the DOT Inspector General's Office in its financial management and reporting processes.¹⁵

FHWA Does Not Measure its Performance over the Full Life of Projects

FHWA uses cost and schedule estimates developed relatively late in a project's development—at the point at which the project is ready to go to construction—as a baseline for measuring its performance. We have discussed our concerns with FHWA's use of later estimates as its baseline measure in earlier work.¹⁶ We have recognized that developing early estimates is difficult; however, we have pointed out that using this late estimate as a baseline for measuring cost growth provides a misleading picture of actual cost growth. This is because cost estimates developed much earlier in the project—for example, at the environmental review stage—are used to make the public investment decision regarding the project. By the time the project goes to construction, a public investment decision effectively has been made, as substantial funds will have been spent on designing the project and acquiring property, commitments will have already been made to the public, and much of the increases in a project's costs may have already occurred.

Moreover, by measuring its performance only after construction begins, FHWA is not tasking itself with or establishing any accountability for controlling cost growth during the part of the process where it exercises direct oversight responsibility. Rather, it has focused its goals on the phases of the project where it exercises less oversight. This is because while FHWA is responsible for reviewing and approving certain state transportation plans, environmental impact assessments, and the acquisition of property for all projects, its role in approving the design and construction of projects varies.

¹⁵We did not independently assess the reliability of FMIS data as the Department's Inspector General has recently reported on weaknesses in FHWA's financial management and reporting processes as part of the annual audit of DOT's consolidated financial statements. In addition, our work focused primarily on FHWA's use of FMIS data for oversight purposes, rather than relying on FMIS data to support our findings and conclusions.

¹⁶[GAO/RCED-97-47](#) and [GAO-02-702T](#).

FHWA's Oversight Activities Have Promising Elements and Limitations

FHWA and its major projects team undertook a number of activities to improve its oversight efforts, which the major projects team documented in its workplan summary (see app. II). Activities undertaken in response to prior concerns included increasing the use of project oversight managers, issuing guidance to states for improving cost estimates throughout the life of projects, developing some information on cost growth of major and other large projects, incorporating more risk assessments into its reviews of state management processes, and attempting to address congressional-committee direction to develop a multidisciplinary approach to its oversight. FHWA's activities in these areas have promising elements and limitations.

FHWA Established Competencies for Project Oversight Managers but Did Not Establish Roles or Consistent Performance Expectations

FHWA has taken some positive steps in its use of project oversight managers for major projects, but it has not yet defined the role of project oversight managers or established agency wide performance expectations for them. Currently, FHWA has assigned project oversight managers to 14 of the 21 active major projects, compared with 7 project oversight managers and 14 major projects in 2002. An FHWA official said that 6 project oversight manager positions would be advertised soon for the other projects and would be filled within 6 months.¹⁷ In August 2002, it issued a core competency framework to identify the technical, professional, and business skills that project oversight managers should possess and to serve as a guide for selecting and developing these managers. This core competency framework defines the skills and supporting behaviors of project oversight managers in areas such as project and financial management, contract administration, and program laws, and it specifies the desired proficiency level for each competency at each grade level.

FHWA has also taken steps to provide guidance and tools for project oversight managers, including an online resource manual and other guidance on reviewing project management plans and finance plans. It also made major projects team staff available to assist the project oversight managers in completing their reviews of such plans, and it sponsored annual meetings for project oversight managers to share experiences. Additionally, FHWA identified external training opportunities to help managers reach or improve their core competency skills. FHWA sent a

¹⁷One major project, which is nearing completion, predates the major project requirements, and a project oversight manager was not assigned to it.

listing of these opportunities to project oversight managers via email and invited these staff to enlist in courses that interested them. For the future, FHWA's 2004 major projects team work plan summary envisions a variety of additional activities to improve the effectiveness of project oversight managers, including working with universities and training vendors to establish a skill set development and certification program to ensure that all project oversight managers acquire the same critical skills and to establish a career path for them. According to FHWA, having a career path would make the position of project oversight manager a more attractive career option because it would provide opportunities to work with more challenging projects and provide promotion opportunities so that managers could advance within FHWA while staying in the project management track.

However, there are limitations with FHWA's efforts so far. While the core competencies define the skills that project oversight managers are expected to possess, they do not define what the managers should do to oversee a major project. FHWA has not yet articulated the role of project oversight managers or established agency wide performance expectations for them. In prior work, we established that setting performance expectations that are linked to goals is important, as a specific alignment between performance expectations and organizational goals helps individuals see the connection between their daily activities and organizational goals.¹⁸

According to FHWA officials, project oversight managers are assigned to the division offices, and each division office defines what its project oversight manager does. At the three division offices we visited that had major projects and project oversight managers, none had set performance expectations for the project oversight manager that specifically tasked the project oversight manager with achieving the goals and outcome measures for the major projects. Project oversight managers and division officials stressed the project oversight managers' close, hands-on involvement with the state transportation agencies in the project, on an almost daily basis. For example, project oversight managers and other division office staff help state transportation agencies prepare finance and project management plans, get involved in design, participate in community outreach, and brief local political leaders on major projects. However, the

¹⁸GAO, *Results-Oriented Culture: Creating a Clear Linkage between Individual Performance and Organizational Success*, GAO-03-488 (Washington, D.C.: Mar. 14, 2003).

extent to which the activity of the project oversight managers supported DOT's cost and schedule goals was not clear.

Finally, without clear roles, responsibilities, and performance expectations for project oversight managers that are clearly linked to FHWA's goals, it is unclear what training is most needed to enable project oversight managers to improve their performance and meet the agency's goals. Our guidance for assessing training efforts cites the need for training efforts to be an integral part of the strategic and performance planning process and to focus on reaching the agency's goals, rather than being implemented ad hoc.¹⁹ Currently, the training opportunities FHWA offers to project oversight managers are identified by the major projects team and are voluntary. There is no program of required courses—staff can choose which courses they would like to take, or take no courses at all. In March 2004, the head of FHWA's major projects team sent an e-mail to the oversight managers advising them of available training. To date, three project oversight managers and one other division office engineer have each volunteered to take one or two courses.

FHWA officials told us they eventually plan to establish a certification program for project oversight managers and to introduce a project oversight manager skills-set or career path to make project management a more attractive career option by setting out opportunities for more challenging projects, and providing promotion opportunities. However, as of December 2004, FHWA does not have a time frame for implementing its plans, and officials told us these activities would not be implemented without additional resources.

FHWA Provided Guidance to States on Developing Cost Estimates but this Guidance is Voluntary and Covers Only Major Projects

In another positive step since 2002, FHWA has provided guidance to state transportation agencies to assist them in applying sound cost estimating practices, including guidance in developing more realistic early cost estimates. However, this guidance is voluntary and covers only major projects, and we found evidence that there is some resistance by FHWA officials to focusing on developing earlier cost estimates. In past work, we have identified problems related to FHWA's lack of accurate cost estimates for projects. For example, in 1997, we found that cost increases occurred on projects, in part, because the initial cost estimates were not reliable

¹⁹GAO, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government*, [GAO-04-546G](#) (Washington, D.C.: Mar. 24, 2004).

predictors of the total costs or financing needs. Rather, these estimates were developed for the environmental review—the purpose of which is to compare project alternatives, not to develop reliable cost estimates. In addition, each state used its own methods and included different types of costs in developing its estimates, since FHWA had no standard requirements for preparing cost estimates. Since that time, in 2003, FHWA surveyed its division offices on cost estimating practices in their states and found a variety of approaches to developing cost estimates, including manually compiling estimates from historical data, using estimated quantity or cost per mile calculations, or utilizing various externally or internally developed software; one state reportedly lacked any formal process. Similarly, the American Association of State Highway and Transportation Officials (AASHTO) reported widely varying practices among the states in developing cost estimates.

In June 2004, FHWA issued guidance that articulated the importance of developing realistic early cost estimates that would be more stable as a project progresses. Specifically, FHWA's guidance stated that it is important that care be taken to present an achievable estimate even in the early stages of project development, because logical and reasonable cost estimates are necessary to maintain public confidence and trust throughout the life of a major project. Moreover, the guidance recognized that cost increases over and above the early planning and environmental estimates for major transportation projects have become of increasing concern to congressional and political leaders, federal and state top managers, and auditing agencies. In addition to recognizing the difficulty of developing more accurate cost estimates early in the project, this guidance includes such components as what should be included in an estimate, how it should be approved, factors to include in contingencies, and other information. This guidance may help states move towards more consistent and reliable cost estimates during the earlier planning phases when decisions are being made about whether or not to go forward with the project, as well as the project's potential design and construction.

FHWA also established help teams that travel to states that ask for assistance in creating better estimates. For example, in March 2003 FHWA was asked by the Kentucky and Indiana transportation departments for help in reviewing the accuracy and reasonableness of the initial cost estimate to complete the Ohio River Bridges project. This project includes two new bridges over the Ohio River that would link eastern Louisville, Kentucky, and Clark County, Indiana, with additional interchange improvements. FHWA staff helped state officials identify the need for

revised cost estimates and more realistic completion dates based on such factors as more realistic right-of-way costs, needed environmental mitigation, revised contingencies, and updated inflation rates. A team of federal and state staff working with consultants recommended that the total cost estimate of the project be revised from \$1.6 billion to \$2.5 billion and that its expected completion date be revised from 2017 to 2020. State officials accepted these recommendations.

While these cost estimating guidance and assistance efforts represent a positive step, it is too early to tell whether they will actually improve cost estimating efforts in most states. Furthermore, there are indications that there is some resistance among FHWA officials and states to emphasizing the importance of more accurate early estimates in practice. For example, some FHWA officials with whom we spoke said that costs cannot be accurately estimated early because issues such as public opposition to a project or unforeseen environmental mitigation procedures that are determined necessary are likely to drive up the cost of a project. They said early estimates should not be used as a basis for monitoring project costs. Other FHWA officials believed that the estimate developed at the conclusion of the design phase, as the project is ready for construction, is the only realistic estimate to be used as a baseline. Some FHWA officials told us that resolving concerns about cost estimates is more a matter of managing public expectations, so that the public understands that early estimates are not reliable and cannot be counted on, and that the actual cost will exceed early estimates. AASHTO also believes that accurately estimating costs at the early stages of a project can be a challenge. According to a May 2004 AASHTO report, property acquisition needs and environmental and regulatory requirements may not be fully known early on, becoming clear only as the project progresses. Public input can contribute to additional features being added to projects, known as “scope creep,” and litigation can delay a project, adding to costs because of inflation.

We recognize that many challenges exist to developing more realistic early estimates that more accurately reflect the expected cost of a project. However, as we have also reported, relying on estimates prepared as a project is ready to move to construction is too late in the process, as substantial funds may have already been spent on designing the project and acquiring property, and a public investment decision may, in effect, already have been made. FHWA’s guidance recognizes that steps can be taken to take uncertainties into account when developing early cost estimates through such means as developing contingencies. Some states have begun

taking action to improve the reliability of early cost estimates. For example, Washington State's Cost Estimate Validation Process uses project teams to identify risk factors, along with costs and mitigation strategies for each factor. These results are then entered into a computer-based modeling program that produces a range and a project cost estimate at the 90 percent confidence level, rather than a single dollar cost estimate.

DOT's proposed legislation for the reauthorization of TEA-21 in 2003 included provisions empowering the Secretary to develop minimum standards for estimating project costs and to perform periodic reviews of state practices for estimating project costs. These provisions were adopted in bills that were separately approved by the House and the Senate in 2004 but that were not enacted before the adjournment of the 108th Congress. According to FHWA officials, if these provisions are adopted, the provisions may require them to move beyond voluntary guidance and issue regulations covering states' practices for estimating costs.

FHWA Has Started to Collect Some Cost Information, but it still Lacks the Capability to Determine the Extent of and Reasons for Cost Growth on Projects

FHWA has started to collect some cost information on some projects, but it still lacks the capability to determine the extent of and reasons for cost growth on projects so that it can better focus its oversight efforts. In 1997 we reported that cost growth occurred on projects, but the extent could not be determined because FHWA's information system for highway projects could not track total costs over the life of a project.²⁰ In 2002, we testified that this information was still not available and noted that recent congressional attempts to gather complete and accurate information about the extent of and the reasons for cost growth had met with limited success.²¹ In response to these concerns and requests from Congress for data, FHWA has begun to collect project cost data, but it has not substantially improved its ability to monitor total costs on projects.

FHWA has undertaken two efforts to collect information on the cost performance of federally financed projects. First, it has started tracking information on cost growth of major projects. The small number of these projects allows the tracking to be done manually on a table containing cost and schedule information for key aspects of each major project. Second, FHWA has developed aggregated cost information on construction

²⁰GAO/RCED-97-47.

²¹GAO-02-702T.

contracts over \$10 million on a state-by-state basis. FHWA has done this by comparing the current estimated costs of all contracts over \$10 million in each state with the engineering estimate developed before the contract was awarded. However, as mentioned earlier, the state-by-state information FHWA has developed has not yet been used to measure performance or target its oversight efforts.

In spite of this progress, FHWA still does not have the capability to measure the extent of and reasons for cost growth on projects. FHWA's principal vehicle for tracking project costs is its financial management system. This system is an accounting system, not a project information system, and it tracks federal reimbursements by contract rather than by project. Because one project can include many contracts over many years, and the system does not automatically link contracts to projects, FHWA has little easily accessible information to help it determine the total overall costs of each project, other than the major projects it tracks individually outside of its financial management system. In one case, FHWA division staff told us that because FHWA's financial management system does not track costs by project, the division developed its own spreadsheet to track project costs.

Our recent work confirmed FHWA's continued difficulty with tracking cost growth on projects. We randomly selected 14 contracts from 7 division offices and asked FHWA's division offices to identify the project related to each contract. We then requested consolidated cost information on the 14 projects. FHWA took an average of more than 3 months—and up to 6 months—to provide us this information for 12 of the 14 projects, and it was unable to provide us complete cost information on the other 2 projects. (See app. I for more details.) The primary reason for FHWA's difficulty in providing us with this information was that FHWA and state staff could not easily or electronically compile information on a project-by-project basis. For example, one division office said it had to develop and run special transaction reports and manually extract the information we wanted because the support files for the information were at different locations, including a state district office, state transportation agency offices, and comptroller offices. Another told us it had to take the extra step of either combining or separating contracts in order to compile information by project, which resulted in more “hand work.” Another said that files on contracts for one project were kept in different locations depending on the stage of the project that the contract was related to. As a result, quite a bit of staff time was tied up as they attempted to get information from multiple departments of the state transportation agency. FHWA's continued difficulties in maintaining accurate and complete data to determine the

extent of cost growth on projects limit its ability to evaluate why cost growth occurs, identify problems and solutions, target its oversight efforts, and transfer lessons learned.

FHWA Has Established Risk Assessments, but These Risk Assessments Are Not Always Used

FHWA expects its division offices to use some form of risk assessment to help guide its reviews of state management processes, also known as process reviews. However, risk assessments are not always being used consistently or effectively. As we reported in 2002, FHWA issued a policy in June 2001 encouraging its division offices to prioritize the risks in the transportation programs in their states and to direct their oversight efforts based on these results. The policy did not require a specific risk assessment approach but allowed division offices flexibility in developing an approach with their state agencies. FHWA considered its establishment of risk assessment practices at the division offices to be the first of a two-phased approach that would lead to an overall risk management program for FHWA, which was still under consideration within FHWA's leadership as of November 2004.

Each of the seven division offices we visited had developed a risk assessment approach, and five out of seven of the offices were using these risk assessments to guide their process reviews. However, at two division offices, the results had not been used to direct their process reviews. Staff at one division office we visited reported that although they had been doing risk assessments for a few years, they did not use the results to target state activities for review. Instead, they targeted state activities for review by meeting with state officials to draw up an intuitive list of state operations for process reviews. Similarly, another division office had drafted a risk assessment approach, but it had not yet tried to use it. Division office staff were skeptical that it would yield better results than their own more intuitive approach to identifying which state program operations warranted a process review.

In addition, in November 2004 the DOT Inspector General reported that FHWA's risk assessments were voluntary and did not provide a systematic approach for assessing program risks throughout the agency. The Office of Inspector General (OIG) reported that risks assessments varied significantly in the scope and methodology used and how the assessment results were rated and classified. As a result, some major programs were not reviewed, and risk assessment results were not reliable or comparable across states. To improve FHWA's process for managing risk, the OIG recommended that FHWA require all division offices to conduct risk

assessments and that it issue guidance to division offices to ensure risk assessments are conducted more strategically and with a disciplined methodology. The OIG further recommended that FHWA analyze trends within individual risk assessments to identify agency wide issues and problems and establish a systematic follow-up process to ensure that oversight attention is given to high-risk areas.²² FHWA was in the process of reviewing and responding to the OIG's recommendations when we concluded our review.

FHWA Has Begun to Take Steps to Develop a Multidisciplinary Approach to Oversight, but its Efforts so Far Have Been Limited

In February 2003, in the Conference Committee Report for the DOT fiscal year 2003 continuing appropriations, the conferees expressed continuing concern about FHWA's management of major projects, and in particular, a concern that FHWA's traditional engineering focus had inhibited oversight in such areas as financing, cost control, and schedule performance.²³ Accordingly, FHWA was directed to evaluate the range of disciplines and skills within its staff and to develop a strategy for achieving a more multidisciplinary approach towards its oversight activities, including identifying staff with such skills as financing and cost estimation.

However, FHWA's human capital plan does not incorporate strategies for developing a workforce to support a more multidisciplinary oversight approach. In prior work, we noted that the process of strategic workforce planning addresses two critical needs: (1) aligning an organization's human capital program with its current mission and programmatic goals; and (2) developing long-term strategies for acquiring, developing, and retaining staff to achieve programmatic goals.²⁴ To some extent, FHWA's human capital plan does this for the agency's current vital few priorities of safety, congestion mitigation, and environmental stewardship. But the agency's oversight mission is not truly incorporated into the plan. FHWA's human capital plan acknowledges the congressional-committee direction FHWA received to develop a more multidisciplinary approach to oversight. The plan states that this approach will require the development or acquisition of

²²DOT Office of Inspector General, *Managing Risk in the Federal-Aid Highway Program*, MH-2005-012 (Washington, D.C.: Nov. 19, 2004).

²³U.S. House of Representatives Conference Report 108-10, *Making Further Continuing Appropriations for the Fiscal Year 2003, and Other Purposes* (Feb. 12, 2003). p. 1263.

²⁴GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: Dec. 11, 2003).

new skills, specifically in the areas of financing, funds accountability, project-level cost control, schedule performance, process management, and transportation planning. However, FHWA's human capital plan does not relate these needed skills to the skills possessed by its present workforce, nor does it address how these skills will be developed or acquired. Instead, FHWA's human capital plan is essentially a plan for replacing individuals in its current key occupations whom it expects to lose through attrition over a 5-year period.²⁵

Additionally, strategies for developing a multidisciplinary approach were not reflected in FHWA's guidance to its division offices for developing their workforce plans. This year, FHWA required its division offices and other units to prepare a workforce plan for the upcoming 3-to-5 year period identifying anticipated skill gaps in their workforce. However, the guidance FHWA provided did not mention the multidisciplinary skills that FHWA had identified in its human capital plan. As we have pointed out in prior work, when planning for the future, leading organizations go beyond simply replacing individuals and engage in broad, integrated planning and management efforts that focus on strengthening both current and future organizational capacity.²⁶ This is particularly important for FHWA, as its traditional engineering focus has drawn congressional committee concern that has led to direction to develop a multidisciplinary approach towards its oversight activities.

Similarly, FHWA's recruiting efforts do not incorporate strategies for developing a more multidisciplinary approach to project oversight. Like its human capital plan, FHWA's recruitment plan for 2003 through 2005 is primarily a plan for hiring to fill the agency's traditional occupations. The recruitment plan does not set any specific goals or objectives for acquiring needed multidisciplinary skills that FHWA articulated in its human capital plan, such as project level cost control, schedule performance, process management, and transportation planning. Under the recruiting plan, the development of a multidisciplinary approach is addressed through FHWA's professional development program (PDP). FHWA's PDP, which historically focused on engineers, is a 2-year program that provides developmental

²⁵The plan focuses on what FHWA has identified as its mission critical occupations: civil engineers, planners, environmental specialists, financial management, engineering technicians, realty specialists, and transportation specialists.

²⁶GAO, *Human Capital: Succession Planning and Management is Critical Driver of Organizational Transformation*, [GAO-04-127T](#) (Washington, D.C.: Nov. 1, 2003).

assignments and on-the-job and classroom training for entry-level staff. Officials told us that PDP staff are now being given assignments allowing them to develop a broader range of skills at the start of their careers, including assignments to division offices with major projects. They also note that over recent years FHWA has been hiring fewer engineers for its PDP programs and more staff from other backgrounds.

The other principal component of FHWA's response to congressional committee direction to develop a multidisciplinary approach to project oversight is training, but the agency has made limited progress in developing new courses to bring new skills to its workforce. Only two new training courses were being developed specifically to address needed skills—a course on project cost estimation and a course on project management for managers in division offices. As of November 2004, both courses were being pilot tested.²⁷ As we noted earlier, it is important for training to be an integral part of an agency's performance planning process to ensure that it contributes to reaching agency goals. However, in its fiscal year 2005 performance plan, FHWA allows divisions the discretion to decide whether or not to participate in multidisciplinary training for its project oversight managers and professional development program staff. In addition, as noted earlier, FHWA has identified and offered external training courses to project oversight managers, but to date only a few managers and other key division staff have expressed an interest. Even so, FHWA human resources officials we spoke to told us they believed that the congressional committee's direction to develop a multidisciplinary approach to project oversight has been largely met through their already existing training efforts. These efforts include making courses available on risk assessment techniques, conducting process reviews, and implementing financial management improvements.

In addition to FHWA's limited progress in developing strategies for meeting this congressional-committee direction, FHWA has not fully embraced the need to develop a more multidisciplinary approach to oversight. FHWA human resources officials we spoke to believed the concern that FHWA's workforce is centered on engineering at the expense of other project oversight skills is based on a misperception—that is, not recognizing that FHWA engineers take on many other tasks not strictly related to

²⁷FHWA officials told us the project management course is targeted to about 100 FHWA officials, and project cost estimating will be provided to about 450 staff, both over the next 2 years.

engineering. Furthermore, two division office officials we spoke to in the course of our work questioned the need for FHWA to focus on multidisciplinary skills. One division administrator commented that “multidisciplinary” means that a person can do many things, and therefore that division’s staff was already multidisciplinary. The deputy administrator in another division questioned what was meant by multidisciplinary skills, believing there was no guidance from headquarters on this.

FHWA Faces Challenges to Improving Oversight

FHWA’s efforts to improve oversight face several challenges. These challenges stem from the structure of the federal-aid highway program and the culture of partnership that has resulted between FHWA and the states. These challenges also stem from FHWA’s decentralized organization, human capital challenges that mirror those faced throughout government, and FHWA’s perception that it has received conflicting signals on its oversight role over the years. Because these challenges are in large part rooted in FHWA’s organization and culture, and in the structure of the program it administers, they may be difficult to surmount.

Structure of the Federal-Aid Highway Program

Because the federal-aid highway program is a state-administered, federally assisted program, it provides states broad flexibility in deciding how to use their funds, which projects to pick, and how to implement them. Furthermore, states are exempt from FHWA oversight on design and construction of many projects. Although DOT has articulated goals and outcome measures for the federal-aid highway program, such as improving safety and reducing the growth of traffic congestion, FHWA must implement and achieve these goals through a program over which it exercises limited control. Our past work across government programs has shown that in programs that have limited federal control, agencies face challenges to ensure that federal funds are efficiently and effectively used.²⁸ We have also found that these challenges can be successfully overcome, in some cases, by ensuring that the program has clear goals and strong analytical data to measure program results. However, as stated earlier, FHWA’s efforts both to implement its goals and to collect and analyze data on project costs have fallen short.

²⁸GAO, *Managing for Results: Measuring Program Results That Are Under Limited Federal Control*, GAO/GGD-99-16 (Washington, D.C.: Dec. 11, 1998).

Exacerbating this challenge is the fact that, as our August 2004 report highlighted, the federal-aid highway program does not have the mechanisms to link funding levels with the accomplishment of goals and outcome measures that DOT has articulated.²⁹ We have also reported that although a variety of tools are available to help measure the potential performance outcomes, such as those that measure the costs and benefits of transportation projects, such potential outcomes often do not drive investment decisions, as many political and other factors influence project selections.³⁰ For example, the law in one state requires that most highway funds, including federal funds, be distributed equally across all of the state's congressional districts. Consequently, the structure of the federal-aid highway program provides no way to measure how funding provided to the states is being used to accomplish particular outcomes, such as reducing congestion or improving safety, and little assurance that projects most likely to accomplish goals and outcome measures articulated by DOT will be funded. The absence of such a link may make it more difficult for FHWA to define its role, the purpose of its oversight, and what its oversight is designed to accomplish.

In August 2004, we reported that policy makers may wish to consider realigning the federal-aid highway program's design, structure, and funding formulas to take into account the program's goals and to include greater performance and outcome oriented features. We also said that such consideration could include the appropriate roles of the federal and state governments, including what type of administrative structure for overseeing the federal-aid highway program would best ensure that the performance goals are measured and accomplished. Our report provided Congress with a matter for congressional consideration and said that the proposed National Commission to assess future revenue sources to

²⁹GAO-04-802.

³⁰GAO, Surface Transportation: Many Factors Affect Investment Decisions, [GAO-04-744](#) (Washington, D.C.: June 30, 2004).

support the Highway Trust Fund might be an appropriate vehicle through which to examine these options.³¹

Culture of Partnership

Consistent with the structure of a state administered, federally assisted program, FHWA has developed a culture of partnership with the states. This culture of partnership dates back to the Federal-Aid Road Act of 1916, when the program was funded through a 50 percent federal and 50 percent state matching share. This partnership approach recognizes that states select, plan, and build projects, while FHWA ensures that federal laws and other requirements are followed by maintaining a close, hands-on involvement with state transportation agencies in delivering projects. FHWA and state officials believe that over the years this partnership has helped to build trust and respect between state transportation agencies and FHWA and ensure that priorities such as safety and the environment are addressed, and has resulted in projects being built more economically and efficiently.

However, there is a potential down side to this partnership approach. When a project overseer becomes an active partner in a project, an arms-length, independent perspective can be lost. In fact, FHWA's partnership approach to project oversight has failed in the past. FHWA had an oversight manager on the Central Artery/Tunnel Project in Boston, Massachusetts, a project that experienced widely-reported cost increases, growing from around \$2.3 billion in the mid-1980s to almost \$15 billion by 2004. In March 2000, an FHWA task force charged with reviewing FHWA's oversight of the project found that FHWA had been caught unaware earlier that year when the state revealed an estimated \$1.4 billion cost increase. The task force attributed this to FHWA's over reliance on trust between itself and the state, reporting that FHWA's partnership approach failed to achieve independent and critical oversight of the project.

FHWA officials acknowledged that independence is critical to effective oversight and also acknowledged the need to closely monitor the performance and independence of their project oversight managers on an

³¹This commission, proposed by the administration and included in both the Senate and House reauthorization bills approved during 2004 but not enacted before the adjournment of the 108th Congress, is to consider how the program is financed and the role of other stakeholders in financing it. As we reported, the appropriate program structure and mechanisms for delivering that funding are important components of making these decisions.

ongoing basis. However balancing the role of overseer and partner can be difficult. In one state we visited, the division's oversight manager for a major project had business cards that identified him as a member of the state's project team—with the project's logo, Website, and e-mail address printed on the card—rather than as a federal employee. Only his position title on the card, "FHWA Project Administrator," identified him as an FHWA employee, rather than as a state employee. Ensuring that FHWA oversight personnel maintain an independent perspective is especially critical given the current lack of linkage between FHWA's performance goals and the roles and expectations of its project managers.

Another potential challenge presented by FHWA's culture of partnership with the states is that it may have prevented FHWA from considering other models for project oversight—including some models in use within DOT. For example, the Federal Transit Administration (FTA) uses competitively selected engineering firms as oversight contractors to monitor major mass transit projects costing over \$100 million. During the project's design, the contractor reviews the grantee's plan for managing the project and determines whether the grantee has the technical capability to complete the project. Once FTA approves the plan, the contractor monitors the project to determine whether it is progressing on time, within budget, and according to plan. In prior work, we noted that FTA's project management oversight program benefited both the agency and the grantees carrying out the projects.³² As another example, DOT established a Joint Program Office to help carry out the Transportation Infrastructure Finance and Innovation Act Program, which provides credit assistance to states and other project sponsors for surface transportation projects. This office reviews and evaluates proposed projects for participation in the program, reviews financial plans and progress reports during project construction, monitors the project sponsor's credit, and coordinates site visits and other oversight activities with DOT field offices.

FHWA's Organization

FHWA administers the federal-aid highway program through a decentralized division office structure and delegates much of FHWA's decisionmaking and program implementation to those offices. Therefore, FHWA's division administrators enjoy wide latitude to implement their programs. FHWA has had a field office in every state since 1944, and,

³²GAO, *Mass Transit: Project Management Oversight Benefits and Future Funding Requirements*, GAO/RCED-00-221 (Washington, D.C.: Sept. 15, 2000).

according to FHWA and state officials, this arrangement gives maximum flexibility to the people closest to the customer and to the issues to make decisions best suited to particular needs and situations. According to FHWA officials, this decentralization of decisionmaking and program implementation to the division offices increased after 1998 and the passage of TEA-21, which eliminated FHWA's nine regional offices.

While this flexibility may have benefits, decentralization presents challenges for the implementation of a consistent national leadership vision and strategies. These long-standing organizational arrangements may have contributed to such conditions as the lack of uniform performance expectations for project oversight managers, widely varying methods used to develop cost estimates for projects, and different approaches to doing risk assessments. Some limitations are by design. For example, while FHWA's fiscal year 2005 performance plan discusses multidisciplinary skill training for its oversight managers and professional development program staff, it also specifically grants division administrators the discretion about whether to participate. FHWA officials acknowledged the challenges of consistently implementing national level goals and programs among the many division offices.

Human Capital

Our 2003 update to our High-Risk Series of reports recognizes that strategic management of human capital continues to be a high-risk area government wide.³³ Although considerable progress has been made since we first designated human capital a government wide high-risk area in 2001, federal human capital strategies are not yet appropriately constituted to drive the transformation that is needed across the federal government. Among the challenges agencies face are the need to improve their ability to acquire, develop, and retain talent, and the need to better and more fully integrate these and other human capital efforts with agencies' missions and program goals.

For FHWA, this government wide challenge manifests itself in a number of ways, including the need to transform its workforce and culture to meet its evolving mission. FHWA's workforce partnered with the states to build the Interstate Highway System from 1956 into the 1990s. FHWA needed engineering skills to perform tasks, such as detailed reviews of design

³³GAO, *High-Risk Series: Strategic Human Capital Management*, [GAO-03-120](#), (Washington, D.C.: Jan. 1, 2003).

plans and inspections of construction progress to ensure that national uniformity in terms of design and safety was established throughout the interstate system. These skills were especially important because, according to FHWA and state officials, state transportation agencies did not have the equivalent capability to do the job at that time. In recent years Congress has recognized the increased capacity of state transportation agencies and increasingly delegated approval authorities to the states, including the authority over design and construction decisions for most projects. As a consequence, FHWA's oversight role and mission have evolved to include, for example, greater reliance on broad reviews of state management processes.

As FHWA's oversight role and mission evolves, FHWA faces the challenge of transforming its workforce and culture to evolve with this role and mission. In our discussions with FHWA field staff, we noted reluctance among some FHWA staff to focus on these broader reviews that FHWA increasingly relies on because they see these as less important than the traditional tasks of reviewing design plans and inspecting the progress of construction. Division office officials in two states we visited told us that change has been an issue for its more tenured staff. For example, the Administrator at one office had begun to hire staff with a variety of skills, while officials at the other office saw a need for more specialists, including staff with financial expertise. Officials also said some staff have resisted doing process reviews because they see it as functioning as auditors rather than as partners with the state in delivering projects, which is how they prefer to be seen. Overcoming these challenges will become even more important in the years ahead should proposed legislation increasing FHWA's oversight responsibilities be enacted.

FHWA's Perception of Conflicting Legislative Direction on Oversight Role and Responsibilities

In 2001, a FHWA task force concluded that changes in the agency's oversight role mandated by highway program authorizations enacted in 1991 and 1998 had resulted in internal confusion and wide variation in interpretations by FHWA personnel covering the agency's roles and responsibilities in overseeing projects.³⁴ In 2002, we reported that FHWA could not say whether it had resolved the internal confusion and variations

³⁴FHWA Stewardship/Oversight Task Force Final Report, March 20, 2001.

in interpretations of the agency's oversight role identified by the task force.³⁵

During our review we found that some confusion continues, as some of the FHWA personnel we spoke to expressed the view that Congress has sent mixed messages about the extent to which it would like to see FHWA oversee projects. According to some division and headquarters FHWA officials, federal laws over the years have required FHWA to withdraw from direct oversight of most projects, while at the same time, legislation has increased the oversight requirements for major projects, resulting in mixed signals. Changes that were proposed by DOT and passed by the House and the Senate in 2004 but not enacted before the adjournment of the 108th Congress could, if reintroduced and enacted by the 109th Congress, help clarify FHWA staff's perception of their oversight role by, for example, mandating reviews of state financial system, developing cost estimating standards, and cascading requirements for major projects to other projects. Enactment of these provisions would also provide Congress the opportunity to provide a more detailed explanation of and purposes for these provisions regarding FHWA's role versus the states' role in overseeing cost and schedule performance of federal-aid highway projects in the legislative history accompanying the reauthorization bill. As we stated in our 2002 testimony, such clarification would be helpful.

Best Practices Can Help Improve Progress and Address Challenges to Improving Project Oversight

Reports and analyses published by us, OMB, and the National Research Council suggest a set of best practices that agencies can benefit from in conducting effective oversight of large infrastructure projects such as those in the federal-aid highway program overseen by FHWA. While these reports and analyses tend to focus more on overall project management, there are elements in each of them that relate specifically to improving project oversight. From our review of these reports and analyses, we identified four best practices that are particularly applicable to FHWA's oversight efforts and that FHWA officials and decision makers can consider to help effectively oversee large infrastructure projects and states' financial and management processes. While some of these best practices are beginning to be reflected in FHWA's activities, as a whole, they could provide a framework for moving to a comprehensive approach to project oversight. These best practices are 1) establishing measurable project

³⁵GAO-02-702T.

oversight goals and communicating these goals down through all levels of the agency, 2) establishing project oversight manager role and accountability based on oversight goals, 3) providing professional training and a career path, and 4) learning lessons and transferring them.

Establishing Measurable Project Oversight Goals and Communicating These Goals through All Agency Levels

As we discussed earlier, agencies seeking to make oversight a priority should establish measurable project oversight goals that help it carry out its mission and define what its oversight is designed to accomplish—and should communicate these goals down through all levels of the agency. Having measurable goals gives managers the means to objectively and quantifiably assess progress toward achieving certain outcomes. If an agency relies only on general goals to guide its efforts, the agency will not have any way of determining whether it achieves those goals since it has not first identified a way to quantify or measure the outcome. Once these goals are established, agencies should communicate these goals down to all levels of the agency. One way to ensure that the goals are communicated effectively is to link the agency’s day-to-day activities to these goals. Our 1998 report on leading practices in capital decision-making added that clear communication of an organization’s vision and goals is a prerequisite for success. Top-level officials develop the organization’s priorities and communicate them downward to subunits within the organization. Based on these goals, managers at all levels work to produce plans and activities that outline their individual strategies for achieving top-level goals.³⁶

Establishing Project Oversight Manager Role and Accountability Based on Oversight Goals

Once an agency establishes its oversight goals, it should incorporate those goals into its strategies and activities by making oversight managers accountable for the effective implementation of the goals. We recently recommended that Amtrak adopt policies and procedures for managing infrastructure projects that, among other things, include mechanisms to ensure accountability for a project’s success. We stated that such mechanisms should clearly indicate the individuals responsible for implementing the project, the expectations for their performance, the ways their performance will be measured, and the potential consequences for

³⁶GAO. *Executive Guide: Leading Practices in Capital Decision-Making*, GAO/AIMD-99-32. (Washington D.C.: Dec. 14, 1999).

failing to meet expectations.³⁷ In this report, we noted that some of the railroads we had contacted tied pay and personnel decisions to performance, holding project managers directly responsible for the project's success and failure. In other previous work, we have also noted that how such pay for performance efforts are done, when they are done, and the basis on which they are done can make all the difference in whether such efforts are successful.³⁸ In addition, in other prior work, in 2000, we found a number of emerging benefits from the use of results-oriented performance agreements for executives, including, among other things, providing results-oriented performance information to serve as the basis for executive performance evaluations.³⁹

Providing Professional Training and a Career path

Professional training enables oversight staff to understand their expected roles in achieving the agency's oversight goals. Having a view of a future career is also desirable for the development of oversight staff. In 1999 the National Research Council reported that the Department of Energy could improve its project performance by developing skills, training opportunities, and a career path in project management. The report added that the agency needed to establish criteria and standards for selecting and assigning project managers, including documentation of training, and should require that all project managers be trained and certified.⁴⁰ In prior work, we have found that an agency's training program should be linked to achieving the agency's strategic goals, while specific training for each individual should be based on his or her developmental needs.⁴¹

³⁷GAO, *Intercity Passenger Rail: Amtrak's Management of Northeast Corridor Improvements Demonstrates Need for Applying Best Practices*, [GAO-04-94](#) (Washington, D.C.: Feb. 27, 2004).

³⁸GAO, *Human Capital: Implementing Pay for Performance at Selected Personnel Demonstration Projects*, [GAO-04-83](#). (Washington, D.C.: Jan. 23, 2004).

³⁹GAO, *Managing for Results: Emerging Benefits From Selected Agencies' Use of Performance Agreements*, [GAO-01-115](#) (Washington D.C.: Oct. 30, 2000).

⁴⁰National Research Council, "Improving Project Management in the Department of Energy," National Academy Press, 1999.

⁴¹[GAO-04-546G](#).

Lessons Learned and Transferred

Effective oversight also requires a proactive approach to establishing evaluation mechanisms, collecting information, and transferring lessons learned on an ongoing basis. Learning from past successes and mistakes and sharing that information with decision makers, agency officials, and project managers is a critical element for effective oversight. Our 1996 executive guide to help agencies implement GPRA reported that agencies analyzing the gap between where they are and where they need to be to achieve desired outcomes can target those processes that are in most need of improvement, set realistic improvement goals, and select an appropriate process improvement technique such as benchmarking. Benchmarking compares an internal agency process with those of private and public organizations that are thought to be the best in their fields.⁴² In addition, our 1998 report on leading practices in capital decision making also found that agencies could evaluate and compare results with goals by using financial and non-financial criteria that link its overall goals and objectives. In 2000, we reported that agencies conducting program evaluations improved their measurement of program performance or understanding of performance and how it might be improved.⁴³ In addition, our Executive Guide on Capital Decision-Making identified practices federal agencies can implement to enhance their evaluation processes.⁴⁴ In 1997, OMB stated in its Capital Programming Guide⁴⁵ that agencies should be able to document and support the accomplishment of the respective agency goals. Agencies can also evaluate the planning and procurement process to determine whether a project accurately predicted the desired benefits 3 to 12 months after it has become operational. The Guide added that conducting a project post-implementation review that evaluates the success or failure of projects serves as an assessment. The review compares actual results against planned cost, returns, and risk. The results are used to calculate a final return on investment, determine whether any additional project modifications may be necessary, and provide lessons learned for changes

⁴²GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#). (Washington D.C.: June 1996).

⁴³GAO, *Program Evaluation: Studies Helped Agencies Measure or Explain Program Performance*. [GAO/GGD-00-204](#). (Washington D.C.: Sept. 29, 2000).

⁴⁴GAO, *Executive Guide: Leading Practices in Capital Decision-Making*, [GAO/AIMD-99-32](#). (Washington D.C.: Dec. 14, 1998).

⁴⁵*Capital Programming Guide*, Office of Management and Budget. July 1997. The Guide is a supplement to Circular A-11, which the Office of Management and Budget issued to help agencies integrate and implement GPRA requirements.

to the agency's capital programming processes and strategy. Finally, the National Research Council's 1999 report stated that agencies such as the Department of Energy should transfer knowledge gained about cost estimating techniques, project review processes, change control mechanisms, and performance metrics from one project to another.

Conclusions

FHWA has made progress since 2002 in improving its oversight efforts, including its direct oversight of major projects and its broader reviews of state management processes that are used to oversee states' management of most other projects. For example, FHWA's actions to enhance the capabilities of project oversight managers overseeing major projects and to incorporate risk assessments into its reviews of state management processes are both positive steps towards improving oversight. Most significantly, FHWA has established, for the first time, goals and measures that clearly make containing project costs and schedules an integral part of how FHWA conducts its oversight.

However, despite promising results, FHWA's efforts have also had limitations. FHWA still lacks a comprehensive approach to ensuring that its oversight of federal-aid highway projects supports the efficient and effective use of federal funds. A comprehensive approach would avail itself of best practices and would include (1) goals and outcome measures with activities and performance expectations set for its staff that are linked to these goals and measures; (2) an overall plan for FHWA's oversight initiatives and activities that responds to past concerns raised about its program and is tied to its goals and measures; (3) workforce planning efforts that support the goals, measures, and overall plan; (4) centrally defined roles and responsibilities for key staff, such as oversight managers for major projects; and (5) the capability to track and measure costs over the life of projects in order to identify problems, help target resources, and transfer lessons learned. Without such a comprehensive approach, FHWA cannot ensure that its varied activities are resulting in tangible improvements in the quality of its oversight and in the performance of federal-aid projects. Furthermore, without a comprehensive approach, FHWA is not able to articulate what it wants its oversight to accomplish, the composition of its workforce to accomplish it, and how it will measure whether its efforts have or have not been successful. Thus, it is limited in its ability to ensure that its oversight efforts are meeting its organizational goals, that these efforts address concerns that have been raised, and that they result in more effective and efficient use of federal funds.

Although broader questions exist about the structure of the federal-aid highway program and the role of FHWA, the agency will face considerable increases in its oversight responsibilities in the years ahead, particularly if the proposals made by DOT and considered by Congress become law. Given the limitations present today, questions exist about the ability of FHWA to effectively absorb these new responsibilities and to improve its oversight of the federal-aid highway program in the years ahead. Moreover, absent a comprehensive approach, FHWA is unlikely to be able to overcome the structural, organizational, and cultural challenges it faces in effectively overseeing the federal-aid highway program.

Recommendations

In order to establish a comprehensive approach to project oversight, we recommend that the Secretary of Transportation direct the Administrator, FHWA, to take the following four actions:

- link FHWA's day-to-day activities and the performance expectations set for its staff to its goals and outcome measures;
- develop an overall plan for its oversight initiatives that is tied to its goals and measures, along with priorities and time frames, and that includes workforce planning efforts that support these goals and measures;
- improve the use and performance of project oversight managers by centrally defining their role and responsibilities; and
- develop the capability to track and measure costs over the life of projects to help identify the extent of and reasons for problems, target resources, and transfer lessons learned.

Agency Comments

We provided a draft of this report to DOT and met with FHWA officials, including the Deputy Administrator, to obtain their comments on the draft. FHWA officials generally agreed with the facts and conclusions in the report and our characterization of the challenges FHWA faces in improving its project oversight. FHWA officials emphasized that although we highlighted potential drawbacks associated with both its culture of partnership with the states and its decentralized organization, this partnership and organization are also major strengths of the federal-aid program that will allow the agency to absorb potential new responsibilities, help overcome challenges, and improve program oversight in the future

through a more comprehensive approach. FHWA officials did not take a position on our recommendations, but they stated that they would be taking them under advisement. They also suggested some technical and clarifying comments that we incorporated into the report as appropriate.

We are sending copies of this report to the Honorable Norman Mineta, Secretary of Transportation. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you have any questions about this report, please contact me at siggerudk@gao.gov, or (202) 512-6570 or contact Steve Cohen at cohens@gao.gov or (202) 512-4864. GAO contacts and acknowledgments are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Katherine Siggerud". The signature is written in a cursive style with a large, looping initial "K".

Katherine Siggerud
Director, Physical Infrastructure

Scope and Methodology

We reviewed the Federal Highway Administration's (FHWA) approach to improving its federal-aid highway project oversight efforts since 2002, including (1) FHWA's oversight-related performance goals and measures, (2) FHWA's oversight improvement activities, (3) challenges FHWA faces in improving project oversight, and (4) best practices for project oversight.

We reviewed FHWA's oversight-related goals and measures by evaluating Department of Transportation (DOT) and FHWA strategic and performance plans, and supporting documents, from 2001 through 2004. We also reviewed FHWA's annual performance reports from 2002 and 2003 and current OMB President's Management agenda documents. We also reviewed FHWA and DOT fiscal year 2005 budgets. As criteria in reviewing this information we used GAO published guidelines and prior reports, including GAO's 2001 Performance Guide and GAO's 2003 Results Oriented Culture and GAO's 2003 Human Capital reports.

To review FHWA's oversight improvement activities we documented and analyzed the status of FHWA's various project oversight efforts since 2002 using FHWA's FY 2004 Work Plan Summary from the major projects team (see app. II). We also reviewed FHWA's use of financial information from its Financial Management Information System (FMIS) to track and analyze trends in cost growth on projects. We did not independently assess the reliability of FMIS data as the Department's Inspector General has reported on weaknesses in FHWA's financial management and reporting processes, most recently in November 2004 as part of the annual audit of DOT's consolidated financial statements. In addition, our work focused primarily on FHWA's use of FMIS data for oversight purposes, rather than relying on FMIS data to support our findings and conclusions. In addition, to document continued difficulty in tracking cost growth on projects, we randomly selected 14 contracts from seven division offices, each of which had an estimated total cost of between \$25 million and \$50 million. We then asked FHWA's division offices to identify the project related to each contract (each contract was part of a different project, so there were 14 projects), and requested consolidated cost information on the 14 projects. FHWA took an average of more than 3 months—and up to 6 months—to provide us this information for 12 of the 14 projects, and it was unable to provide us complete cost information on the other 2 projects. Finally, we also interviewed officials at FHWA Headquarters, selected FHWA division offices, state departments of transportation, and other officials to document oversight implementation efforts.

We performed work at seven FHWA division offices and states located in Colorado, Georgia, Missouri, Nevada, Pennsylvania, Washington, and Wisconsin. We selected these 7 FHWA division offices and corresponding states by selecting states that had a current or planned major project and some that did not; states with large as well as relatively small federal-aid highway programs in terms of funding; large and small FHWA division offices as measured by the number of staff; and division offices and states that FHWA and the American Association of State Highway and Transportation Officials (AASHTO) officials had recommended because of ongoing initiatives related to project oversight and management.

To document and review the challenges FHWA faces in improving its project oversight we used our past work and interviewed FHWA headquarters, division office and state transportation program officials. We also interviewed AASHTO officials and state audit and evaluation organizations across the country.

To address the use of best practices as a framework for the oversight of large highway infrastructure projects, we conducted a literature search in 2004 to identify best practices related to oversight management. The literature included our previous reports and guidelines on best practices related to project management. It also included publications from the Office of Management and Budget (OMB) that provided detailed guidance to federal agencies on planning, budgeting, acquisition, and management of capital assets and from the National Research Council addressing methods the Department of Energy could implement to improve its project management, including oversight of environmental restoration, waste management, and construction projects. From this literature search, we compiled the list of best practices that can provide FHWA with a comprehensive approach and basic framework for effectively overseeing highway projects. For the first practice of establishing measurable project oversight goals we used information from two of our reports related to the Government Performance and Results Act and another report related to leading practices in capital decision-making. For the second practice of establishing project oversight manager role and accountability based on oversight goals, we used our report related to improving project management for Amtrak and another of our reports on performance agreements. For the third practice of providing professional training and a career path, we used a National Research Council report on improving project management at the Department of Energy. For the fourth practice of learning lessons and transferring them, we used information from the National Research Council report mentioned above, the GAO report on

Appendix I
Scope and Methodology

leading practices in capital decision-making, another GAO report on program evaluations, and OMB guidance in Circular A-11 and its Capital Programming Guide.

FHWA FY 2004 Major Project Team Work Plan Summary

Activity	Status
Issue final project management plan guidance	Completed
Develop cost estimating guidance	Completed
Issue major project delivery template	Under Development
Establish independent cost estimating review program	Under Development
Establish major project cost and schedule measures	No Work Started
Monitor project cost growth	Ongoing
Coordinate with other transportation programs	Ongoing
Reevaluate major project finance plan guidance	Under Development
Develop finance plan guidance for projects over \$100m	No Work Started
Identify trends in finance plans	Under Development
Host new FHWA hires	Ongoing
Manage project oversight manager positions	Ongoing
Develop clear statement of team objectives	Completed
Implement major project team marketing plan	Ongoing
Develop working relationships with other DOT agencies	Ongoing
Develop executive level major projects training	Under Development
Develop risk-based conflict management model	No Work Started
Facilitate organizational career track for oversight managers	No Work Started
Monitor selected projects	Ongoing
Review project finance plans and annual updates	Ongoing
Conduct training and outreach	Ongoing
Establish risk management program	Under Development
Promote oversight best practices	Ongoing
Restructure oversight group website	Under Development
Establish and lead oversight working group	Under Development
Establish cross-functional oversight website	Under Development
Identify risk assessment training opportunities	Under Development
Identify national trends in process reviews	No Work Started
Establish oversight agreement repository	Completed
Develop new generation of oversight performance measures	No Work Started
Develop performance pilot measures	No Work Started
Facilitate the development of cost growth countermeasures	No Work Started
Prepare major project team report to Congress	Ongoing
Conduct monthly project tracking activities	Ongoing
Develop major project continuum model	Under Development

Appendix II
FHWA FY 2004 Major Project Team Work
Plan Summary

(Continued From Previous Page)

Activity	Status
Establish skill sets development program for oversight managers	Under Development
Monitor large projects in preconstruction stage	No Work Started
Identify preconstruction project milestones	No Work Started
Establish major project speakers' bureau	No Work Started
Establish major project briefing repository	No Work Started
Establish training and development opportunities for new staff	No Work Started
Organize annual project oversight managers meeting	Ongoing
Participate in National Engineer's Week	Ongoing
Serve as structural liaison	Ongoing
Conduct security vulnerability assessments	Ongoing
Establish national best practice and lessons learned program	Under Development
Post best practices and lessons learned material on website	Under Development
Produce best practices and lessons learned bulletins	No Work Started

Source: GAO.

GAO Contacts and Staff Acknowledgments

GAO Contacts

Kate Siggerud (202) 512-2834
Steve Cohen (202) 512-4864

Staff Acknowledgements

In addition to those named above, Sam Abbas, Catherine Colwell, Pat Dalton, Don Kittler, Alex Lawrence, Sara Ann Moessbauer, John Rose, Stacey Thompson, and Alwynne Wilbur made key contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Paul Anderson, Managing Director, AndersonP1@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548