Testimony
Before the Subcommittee on
Transportation, Treasury and Independent
Agencies, Committee on Appropriations,
House of Representatives

FEDERAL-AID HIGHWAYS

Cost and Oversight of Major
Highway and Bridge
Projects—Issues and
Options

Statement for the Record by
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GAO and others have reported that cost growth has occurred on major highway and bridge projects; however, overall information on the amount of and reasons for cost increases is generally not available because neither FHWA nor state highway departments track this information for entire projects. GAO has found that costs grow, in part, because initial cost estimates, which are generally developed to compare project alternatives during a required environmental review phase, are not reliable predictors of projects' total costs. In addition, FHWA approves the estimated costs of major projects in phases, rather than agreeing to the total costs at the outset. By the time FHWA approves the total cost of a major project, a public investment decision might, in effect, already have been made because substantial funds could already have been spent on designing the project and acquiring property. FHWA's implementation of a TEA-21 requirement that states develop annual finance plans for major projects estimated to cost $1 billion or more has improved the oversight of some major projects, and FHWA is incorporating more risk assessment in its day-to-day oversight activities.

Should Congress determine that enhancing federal oversight of major highway and bridge projects is needed and appropriate, GAO has identified options, including improving information on the cost performance of selected major projects, improving the quality of initial cost estimates, and enhancing and clarifying FHWA’s role in reviewing and approving major projects. Adopting any of these options would require balancing the states’ sovereign right to select projects and desire for flexibility and more autonomy with the federal government’s interest in ensuring that billions of federal dollars are spent efficiently and effectively. In addition, the additional costs of each of these options would need to be weighed against its potential benefits.

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Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to offer this statement for the record concerning efforts by the Federal Highway Administration (FHWA) to oversee and control the costs of major highway and bridge projects—80 percent of which are often paid by the federal government. \(^1\) With freight traffic expected to double and congestion projected to worsen over the next 20 years, widespread consensus exists on the need to maintain and improve the nation’s surface transportation infrastructure. Given that both the federal government and state governments are facing budget deficits in the hundreds of billions of dollars in the coming years, it is even more important that major highway and bridge projects be managed efficiently and cost effectively. While effectively managing these projects involves many factors other than cost—including safety, quality, mobility, and environmental impact—cost increases on major projects often take center stage, especially in light of the growing competition for federal dollars.

My statement today is based on a body of work we have performed and products we have issued since 1995 on the costs and oversight of major highway and bridge projects. (See the list of related GAO products at the end of this statement.) Today’s statement (1) summarizes these cost and oversight issues, (2) discusses FHWA’s recent efforts to improve the management and oversight of these projects, and (3) describes options we have identified that might enhance federal oversight of these projects, should Congress determine that such action is needed and appropriate.

In summary:

- We have reported—as has the Department of Transportation’s (DOT) Inspector General and various state audit and evaluation agencies—that cost growth has occurred on many major highway and bridge projects. However, overall information on the amount of and reasons for cost increases on major projects is generally not available because neither FHWA nor state highway departments track this information over the life of projects. While many factors can cause costs to increase, we have found, on projects we have reviewed, that costs increased, in part, because initial cost estimates were not reliable predictors of the total costs or financing needs of projects. Rather, these estimates were generally

\(^1\) There is currently no standard definition of what constitutes a “major” project. The definition has been applied to projects ranging from those with a total cost of as little as $10 million to those estimated to cost $1 billion or more.
developed for the environmental review—whose purpose was to compare project alternatives, not to develop reliable cost estimates. In addition, we reported in 1997\(^2\) that FHWA had done little to ensure that containing costs was an integral part of the states’ project management, in part because FHWA believed it had no mandate to either encourage or require states to adopt such practices. Finally, we have noted that FHWA generally approves the estimated cost of a major project in phases, when individual project segments are ready for construction, rather than agreeing to the total cost of the entire project at the outset. By the time FHWA approves the total cost of a major project, a public investment decision might, in effect, already have been made because substantial funds would already have been spent on designing the project and acquiring property, and many of the increases in the project’s estimated costs might already have occurred.

- Since 1998, FHWA has taken a number of steps to improve the management and oversight of major projects, including implementing a requirement of the Transportation Equity Act for the 21st Century (TEA-21) that states develop, and that the Secretary approve, annual finance plans for any highway or bridge project estimated to cost $1 billion or more. As of May 2003, FHWA had approved finance plans for 10 federal-aid highway projects and expected finance plans to be prepared for 5 additional projects in the future.\(^3\) As I testified in May 2002,\(^4\) while indications are that the finance plan requirement has improved the oversight of some major projects, many multibillion-dollar corridor projects representing a substantial investment of federal funds will not be covered by the requirement because the projects will be constructed as a series of smaller projects that will cost less than $1 billion each. Other steps FHWA has taken to improve its oversight include introducing greater risk-based oversight into its day-to-day activities and attempting to resolve conflicting interpretations of its oversight role that it believes have occurred since 1991, when the states began assuming greater responsibility for approving the design and construction of many projects.

\(^2\)Transportation Infrastructure: Managing the Costs of Large-Dollar Highway Projects (GAO/RCED-97-47, Feb. 27, 1997).

\(^3\)FHWA also requires finance plans for projects that funded under the Transportation Infrastructure Finance and Innovation Act. Currently, 3 additional projects funded under the act have approved finance plans.

Finally, FHWA has taken actions to respond to a DOT task force report on the management and oversight of major transportation projects, such as developing and publishing core competencies for managers overseeing major projects. However, FHWA has not yet developed goals or measurable outcomes linking its oversight activities to its business goals in its performance plan, as an FHWA task force recommended in 2001. As I testified in May 2002, until FHWA takes these actions, it will be limited in its ability to judge the success of its efforts or to know whether conflicting interpretations of the agency’s roles have been resolved.

- Our past work, including my testimony of May 2002, presented options for enhancing FHWA’s role in overseeing the costs of major highway and bridge projects, should Congress, in reauthorizing TEA-21, determine that such action is needed and appropriate. These options include improving information on the cost performance of selected major highway and bridge projects, improving the quality of initial cost estimates, and enhancing and clarifying FHWA’s role in reviewing and approving major projects. Each of these options entails a commitment of additional resources and poses costs and challenges that must be weighed against the option’s potential benefits. Adopting one or more of these options would require Congress to determine the appropriate federal role—balancing the state’s sovereign right to select its projects and desire for flexibility and more autonomy with the federal government’s interest in ensuring that billions of federal dollars are spent efficiently and effectively.

FHWA provides funding to the states for roadway construction and improvement projects through various programs collectively known as the federal-aid highway program. Most highway program funds are distributed to the states through annual apportionments according to statutory formulas; once apportioned, these funds are generally available to each state for eligible projects. The responsibility for choosing projects to fund 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

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

6 Most of the funding for these programs is derived from highway user taxes, such as excise taxes on motor fuels, tires, and the sale of trucks and trailers, and taxes on the use of heavy vehicles.
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 in no way infringe on the sovereign right of the states to determine which projects shall be federally financed.”

While FHWA approves state transportation plans, environmental impact assessments, and the acquisition of property for highway projects, its role in approving the design and construction of projects varies. Relatively few projects are subject to “full” oversight, in which FHWA prescribes design and construction standards, approves design plans and estimates, approves contract awards, inspects construction progress, and renders final acceptance on projects when they are completed. Under TEA-21, FHWA exercises full oversight only of certain high-cost Interstate system projects. For other federally assisted projects, there are two options. First, for a project that is not located on the Interstate system but is part of the National Highway System, a state may assume responsibility for overseeing the project’s design and construction unless the state or FHWA determines that this responsibility is not appropriate for the state. Second, for a project that is not part of the National Highway System, the state is required to assume responsibility for overseeing the project’s design and construction unless the state determines that this responsibility is not appropriate for it. Under both options, TEA-21 requires FHWA and each state to enter into an agreement documenting the types of projects for which the state will assume oversight responsibilities.

A major highway or bridge construction or repair project usually has four stages: (1) planning, (2) environmental review, (3) design and property acquisition, and (4) construction. The state’s activities and FHWA’s corresponding approval actions are shown in figure 1.

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7 States may assume responsibilities for other types of Interstate system projects, including projects to resurface, restore, and rehabilitate Interstate roadways, and those Interstate construction or reconstruction projects estimated to cost less than $1 million.

8 Designated in 1995, the 160,000-mile National Highway System consists of the Interstate Highway System and other principal arterial routes that serve major population centers, international border crossings, national defense requirements, and interstate and interregional travel needs. Other highways and roads make up the remaining 4 million miles of roads in the United States.
In TEA-21, Congress required states to submit annual finance plans to DOT for highway and bridge projects estimated to cost $1 billion or more. Congress further required each finance plan to be based on detailed estimates of the costs to complete the project and on reasonable assumptions about future increases in such costs.
Our work has raised issues concerning the cost and oversight of major highway and bridge projects, including the following:

- Cost growth has occurred on many major highway and bridge projects. For example, on 23 of 30 projects initially expected to cost over $100 million, our 1997 report identified increases ranging from 2 to 211 percent—costs on about half these projects increased 25 percent or more.\(^9\) In addition, the DOT Inspector General has recently identified cost increases on major projects such as the Wilson Bridge, Springfield Interchange, and Central Artery/Tunnel projects. As I testified in 2002, reviews by state audit and evaluation agencies have also highlighted concerns about the cost and management of major highway and bridge programs.\(^10\) For example in January 2001, Virginia’s Joint Legislative Audit and Review Commission found that final project costs on Virginia Department of Transportation projects were well above their cost estimates and estimated that the state’s 6-year, $9 billion transportation development plan understated the costs of projects by up to $3.5 billion. The commission attributed these problems to several factors, including not adjusting estimates for inflation, expanding the scope of projects, not consistently including amounts for contingencies, and committing design errors.\(^11\)

- Although cost growth has occurred on many major highway and bridge projects, overall information on the amount of and reasons for cost increases on major projects is generally not available because neither FHWA nor state highway departments track this information over the life of projects. Congressional efforts to obtain such information have met with limited success. For example, in 2000 the former Chairman of this subcommittee asked FHWA to provide information on how many major federal-aid highway projects had experienced large cost overruns. Because FHWA lacked a management information system to track this information, officials manually reviewed records for over 1,500 projects authorized

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\(^9\)GAO/RCED-97-47

\(^10\)GAO-02-702T.

over a 4-year period.\textsuperscript{12} FHWA’s information, however, measured only the increases in costs that occurred after the projects were fully designed. Thus, cost increases that occurred during the design of a project—where we have reported that much of the cost growth occurs—were not reflected in FHWA’s data. In contrast to the federal-aid highway program, the Office of Management and Budget requires federal agencies, for acquisitions of major capital assets, to prepare baseline cost and schedule estimates and to track and report the acquisitions’ cost performance. These requirements apply to programs managed by and acquisitions made by federal agencies, but they do not apply to the federal-aid highway program, a federally assisted state program.

- While many factors can cause costs to increase, we have found, on projects we have reviewed, that costs increased, in part, because initial cost estimates were not reliable predictors of the total costs or financing needs of projects. Rather, these estimates were generally developed for the environmental review—whose purpose was to compare project alternatives, not to develop reliable cost estimates. In addition, each state used its own methods to develop its estimates, and the estimates included different types of costs, since FHWA had no standard requirements for preparing cost estimates. For example, one state we visited for our 1997 report included the costs of designing projects in its estimates, while two other states did not.\textsuperscript{13} We also found that costs increased on projects in the states we visited because (1) initial estimates were modified to reflect more detailed plans and specifications as projects were designed and (2) the projects’ costs were affected by, among other things, inflation and changes in scope to accommodate economic development over time.

- In 1997, we reported that cost containment was not an explicit statutory or regulatory goal of FHWA’s full oversight. On projects where FHWA exercised full oversight, it focused primarily on helping to ensure that the applicable safety and quality standards for the design and construction of highway projects were met. According to FHWA officials, controlling costs was not a goal of their oversight and FHWA had no mandate in law to encourage or require practices to contain the costs of major highway projects. While FHWA influenced the cost-effectiveness of projects when it reviewed and approved plans for their design and construction, we found

\textsuperscript{12}For the purposes of this analysis, FHWA identified major projects as those that were expected to cost $10 million or more to construct and had experienced cost increases of 25 percent or more. FHWA identified 80 such major projects, 12 of which were part of the Central Artery/Tunnel project in Massachusetts.

\textsuperscript{13}GAO/RCED-97-47.
it had done little to ensure that cost containment was an integral part of
the states’ project management.

- Finally, we have noted that FHWA’s oversight and project approval
  process consists of a series of incremental actions that occur over the
  years required to plan, design, and build a project. In many instances,
  states construct a major project as a series of smaller projects, and FHWA
  approves the estimated cost of each smaller project when it is ready for
  construction, rather than agreeing to the total cost of the major project at
  the outset. In some instances, by the time FHWA approves the cost of a
  major project, a public investment decision may, in effect, already have
  been made because substantial funds have already been spent on
  designing the project and acquiring property, and many of the increases in
  the project’s estimated costs have already occurred.

**Efforts by FHWA to Improve the Management and Oversight of Major Projects**

Since 1998, FHWA has taken a number of steps to improve the
management and oversight of major projects. FHWA implemented TEA-
21’s requirement that states develop an annual finance plan for any
highway or bridge project estimated to cost $1 billion or more.
Specifically, FHWA developed guidance that requires state finance plans
to include 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. As of
May 2003, FHWA had approved finance plans for 10 federal-aid highway
projects and expected finance plans to be prepared for 5 additional
projects at the conclusion of those projects’ environmental review phase.\(^\text{14}\)
In addition, FHWA established a major projects team that currently tracks
and reports each month on these 15 projects, and has assigned—or has
requested funding to assign—a full-time manager to each project to
provide oversight. These oversight managers are expected to monitor their
project’s cost and schedule, meet periodically with project officials, assist
in resolving issues and problems, and help to bring “lessons learned” on
their projects to other federally assisted highway projects.

\(^{14}\)FHWA also requires finance plans for projects that funded under the Transportation
Infrastructure Finance and Innovation Act. Currently, 3 additional projects funded under
the act have approved finance plans.
As I testified in 2002, there are indications that the finance plan requirement has produced positive results. For example, in Massachusetts, projections of funding shortfalls identified in developing the Central Artery/Tunnel project’s finance plan helped motivate state officials to identify new sources of state financing and implement measures to ensure that funding was adequate to meet expenses for the project. However, some major corridor projects will not be covered by the requirement. FHWA has identified 22 corridor projects that will be built in “usable segments”—separate projects costing less than $1 billion each—and therefore will not require finance plans. According to FHWA officials, states plan these long-term projects in segments because it is very difficult for them to financially plan for projects extending many years into the future. Nevertheless, these major projects represent a large investment in highway infrastructure. For example, planned corridor projects that will not require finance plans total almost $5 billion in Arkansas, about $12.3 billion in Texas, about $5.3 billion in Virginia, and about $4.2 billion in West Virginia. In addition, the $1 billion threshold does not consider the impact of a major highway and bridge project on a state’s highway program. In Vermont, for instance, a $300 million project would represent a larger portion of the state’s federal highway program funding than a $1 billion dollar project would represent in California.

In addition to implementing TEA-21’s requirements, FHWA convened a task force on the stewardship and oversight of federal-aid highway projects and, in June 2001, issued a policy memorandum to improve its oversight. The memorandum directed FHWA’s field offices to conduct risk assessments within their states to identify areas of weakness, set priorities for improvement, and work with the states to meet those priorities. Soon afterwards, FHWA convened a review team to examine its field offices’ activities, and in March 2003, it published an internal “best practices” guide to assist the field offices in conducting risk assessments. FHWA also began an effort during 2003 to identify strategies for assessing and managing risks and for allocating resources agencywide.

FHWA’s policy memorandum further sought to address the task force’s conclusion that changes in the agency’s oversight role since 1991 had resulted in conflicting interpretations of the agency’s role in overseeing projects. The task force found that because many projects were classified as “exempt” from FHWA’s oversight, some of the field offices were taking

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a “hands off” approach to these projects. The policy stipulates that while states have responsibility for the design and construction of many projects, FHWA is ultimately accountable for the efficient and effective management of all projects financed with federal funds and for ensuring compliance with applicable laws, regulations, and policies.

While FHWA has been moving forward to incorporate risk-based management into its oversight through the use of risk assessments, it has not yet developed goals or measurable outcomes linking its oversight activities to the business goals in its performance plan, nor has it developed a monitoring plan as its task force recommended in 2001. As I testified in May 2002, until FHWA takes these actions, it will be limited in its ability to judge the success of its efforts or to know whether the conflicting interpretations of its roles discussed above have been resolved.

Finally, FHWA has taken actions to respond to a DOT task force report on the management and oversight of major projects. In December 2000, this task force concluded that a significant effort was needed to improve the oversight of major transportation projects—including highway and bridge projects. The task force made 24 recommendations, including recommendations to establish an executive council to oversee major projects, institute regular reporting requirements, and establish a professional cadre of project managers with required core competencies, training, and credentials. The task force’s recommendations were not formally implemented for several reasons, including turnover in key positions and the need to reevaluate policy following the change in administrations in January 2001, and higher priorities brought on by the events of September 11, 2001. However, FHWA believes it has been responsive to the task force’s recommendations by establishing a major projects oversight team, designating an oversight manager for each project, and, most recently, developing and publishing core competencies for managers overseeing major projects.

In addition, 7 of the task force’s 24 recommendations would have required legislation. For example, the task force recommended establishing a separate funding category for preliminary engineering and design—those activities that generally accomplish the first 20 to 35 percent of a project’s design. The task force concluded that a separate funding category would allow a new decision point to be established. Initial design work could

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Proceed far enough so that a higher-quality, more reliable cost estimate would be available for decisionmakers to consider before deciding whether to complete the design and construction of a major project—and before a substantial federal investment had already been made.

Options to Enhance Federal Oversight of Major Projects

In my testimony of May 2002, I presented options for enhancing FHWA’s role in overseeing the costs of major highway and bridge projects, should Congress, in reauthorizing TEA-21, determine that such action is needed and appropriate. Each of these options would be difficult and possibly costly; each represents a commitment of additional resources that must be weighed against the option’s potential benefits. Adopting any of these options would require Congress to determine the appropriate federal role—balancing the states’ sovereign right to select its projects and desire for flexibility and more autonomy with the federal government’s interest in ensuring that billions of federal dollars are spent efficiently and effectively. These options include the following:

- Have FHWA develop and maintain a management information system on the cost performance of selected major highway and bridge projects, including changes in estimated costs over time and the reasons for such changes. While Congress has expressed concern about cost growth on major projects, it has had little success obtaining timely, complete, and accurate information about the extent of and the reasons for this cost growth on projects. Such information could help define the scope of the problem with major projects and provide insights needed to fashion appropriate solutions.

- Improve the quality of initial cost estimates by having states develop—and having FHWA assist the states in developing—more uniform and reliable total cost estimates at an appropriate time early in the development of major projects. This option could help policymakers understand the extent of the proposed federal, state, and local investment in these projects, serve as a baseline for measuring cost performance over time, and assist program managers in reliably estimating financing requirements.

- Have states track the progress of projects against their initial baseline cost estimates. Expanding the federal government’s practice of having its own agencies track the progress of the acquisition of major capital assets against baseline estimates to the federally assisted highway program could enhance accountability and potentially improve the management of major projects by providing managers with real-time information for identifying problems early, and for making decisions about project changes that could
affect costs. Tracking progress could also help identify common problems and provide a better basis for estimating costs in the future.

- Establish performance goals for containing costs and implement strategies for doing so as projects move through their design and construction phases. Such performance goals could provide financial or other incentives to the states for meeting agreed-upon goals. Performance provisions such as these have been established in other federally assisted grant programs and have also been proposed for use in the federal-aid highway program. Requiring or encouraging the use of goals and strategies could also improve accountability and make cost containment an integral part of how states manage projects over time.

- Expand FHWA's finance plan requirement to other projects. While Congress has decided that enhanced federal oversight of the costs and funding of projects estimated to cost over $1 billion is important, projects of importance for reasons other than cost may not, as discussed earlier, receive such oversight. Should Congress believe such an action would be beneficial, additional criteria for defining projects would need to be incorporated into FHWA's structure for overseeing the costs and financing of major projects.

- Clarify FHWA's role in overseeing and reviewing the costs and management of major projects. Changes in FHWA's oversight role since 1991 have created conflicting interpretations about FHWA's role, and our work has found that FHWA questions its authority to encourage or require practices to contain the costs of major highway projects. Should uncertainties about FHWA's role and authority continue, another option would be to resolve the uncertainties through reauthorization language.

- Establish a process for the federal approval of major projects. This option, which would require federal approval of a major project at the outset, including its cost estimate and finance plan, would be the most far-reaching and the most difficult option to implement. Potential models for such a process include the full funding grant agreement process that the Federal Transit Administration uses for major transit projects, and the DOT task force's December 2000 recommendation calling for the establishment of a separate funding category for initial design work and a new decision point for advancing projects. Establishing such a federal approval process could have the potential to improve the reliability of the initial baseline estimates and the cost performance of major projects over time.
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