

# GAO Highlights

Highlights of [GAO-13-544](#), a report to congressional committees

## Why GAO Did This Study

LCCA provides state transportation agencies with a tool to evaluate and select the most cost-effective type of pavement, one of the major cost components of many highway projects. Given the high demand for federal highway funding, the federal government has an acute interest in helping states use LCCA to make cost-effective decisions when investing federal-aid highway funds. Accordingly, it is important that FHWA's guidance on LCCA aligns with best practices. The Moving Ahead for Progress in the 21<sup>st</sup> Century Act directed GAO to review LCCA best practices. GAO (1) described how state transportation agencies conduct and use LCCA and (2) assessed the extent to which FHWA's LCCA guidance conforms to the GAO *Cost Guide's* cost-estimating best practices.

GAO reviewed states' LCCA practices and interviewed officials from 16 states (visiting 4), selected to provide information on a wide range of LCCA approaches and a wide geographical distribution. Information gathered from these states is not generalizable to all states. GAO also interviewed FHWA officials. GAO assessed the extent to which FHWA's LCCA guidance, including software and documentation, conforms to best practices.

## What GAO Recommends

To better ensure federal-aid highway funds are invested effectively, FHWA should update LCCA guidance to fully incorporate the *Cost Guide's* best practices. The Department of Transportation agreed to consider this recommendation and provided technical comments that were incorporated as appropriate.

View [GAO-13-544](#). For more information, contact James R. McTigue, Jr., at (202) 512-2834 or [McTigueJ@gao.gov](mailto:McTigueJ@gao.gov).

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## FEDERAL-AID HIGHWAYS

### Improved Guidance Could Enhance States' Use of Life-Cycle Cost Analysis in Pavement Selection

## What GAO Found

Thirteen of the 16 state transportation agencies GAO contacted used Life-Cycle Cost Analysis (LCCA) to select the pavement type (e.g., asphalt or concrete) for certain road construction and rehabilitation projects. Officials in all 13 states indicated that LCCA helped ensure that the agency selected the pavement that was most cost-effective over the long term, but states' specific LCCA practices varied. In general, these states used LCCA for larger projects, but each state had unique criteria to determine which projects should be subject to an LCCA. Likewise, the broad categories of LCCA inputs—such as agency costs, timing of future road work, and discount rate—are similar, but state transportation agencies handled each of these inputs in different ways. For example, estimates of when future roadwork would occur for a particular pavement type were based on state-specific factors, such as past experience with pavements and climate. Furthermore, state agencies used different criteria to decide if LCCA results clearly indicated a pavement type with the lowest life-cycle cost. In 9 of the 13 states that used LCCA, the Federal Highway Administration's (FHWA) LCCA guidance was an important influence on state practices, according to state transportation officials, and 7 states used LCCA software developed by FHWA.

FHWA's LCCA guidance largely aligns with the GAO *Cost Guide's* best practices for two of the four phases of the cost-estimating process and partially aligns with two other phases. FHWA's guidance in the *Initiation* phase, which includes initial planning steps, aligns with best practices overall. Agency guidance covers about half of the best practices of the *Assessment* phase, but does not, for example, discuss the use of independent cost estimates for comparison and cross checks, an important quality step to ensure the estimate's credibility. In the *Analysis* phase, FHWA's guidance does a good job explaining how to address the variability inherent in cost estimation, but could better address how LCCA should be documented for subsequent review. Lastly, in the *Presentation* phase, FHWA's guidance does not include sufficient information on how to present LCCA results to management for decision-making and on when an LCCA should be updated. By better incorporating best practices in the guidance, FHWA could help states produce credible and accurate cost estimates and make more cost-effective federal-aid highway fund investment decisions.

#### Federal Highway Administration's Guidance Compared to GAO *Cost Guide's* Best Practices

Cost estimating phase	Initiation	Assessment	Analysis	Presentation
Overall phase assessment	Aligns	Partially aligns	Substantially aligns	Partially aligns
<b>Key:</b>				
Aligns	Substantially aligns	Partially aligns	Minimally aligns	Does not align
Completely satisfied the best practice	Satisfied a large portion of the best practice	Satisfied about half of the best practice	Satisfied a small portion of the best practice	Did not satisfy the best practice

Source: GAO analysis of Federal Highway Administration documents.