



U.S. DEPARTMENT OF TRANSPORTATION  
**OFFICE OF INSPECTOR GENERAL**

**FHWA Lacks Adequate Oversight and  
Guidance for Engineer's Estimates**

**FHWA**

Report No. ST2019020

March 13, 2019





## FHWA Lacks Adequate Oversight and Guidance for Engineer's Estimates

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*Self-initiated*

Federal Highway Administration | ST2019020 | March 13, 2019

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### What We Looked At

Each year, the Federal Highway Administration (FHWA) oversees more than \$40 billion in Federal funding for highway and bridge projects across the United States. For each project, a State Department of Transportation (State DOT) develops a conceptual cost estimate that is refined over time. The cost estimate prepared at the final design stage, called the Engineer's Estimate, is an essential element in the project-approval process—used by State DOTs as a benchmark for analyzing bids and to authorize the Federal funds. While underestimating the Engineer's Estimate can lead to project delays as additional funding is sought, overestimating causes an inefficient use of funds, which have been obligated and cannot be used for other projects. In either case, the Federal-aid highway program can be negatively affected. Accordingly, our objectives for this self-initiated audit were to assess (1) FHWA's progress in implementing key recommendations from its *2015 National Review of State Cost Estimation Practice* (2015 National Review) and (2) FHWA's *2004 Guidelines on Preparing Engineer's Estimate, Bid Reviews and Evaluation* (2004 Guidance), including how the Agency monitors the accuracy of the estimates prepared by the States.

### What We Found

FHWA has made limited progress in implementing the six key recommendations from its 2015 National Review, particularly those related to developing a national cost-estimation training and updating the Agency's 2004 Guidance. FHWA also has not followed up to determine whether and how its Division Offices are progressing on the other four key recommendations, which focused on their processes for developing reliable cost-estimating practices. Finally, FHWA lacks adequate guidance and processes to oversee and monitor the accuracy of Engineer's Estimates.

### Our Recommendations

We made four recommendations to help FHWA ensure that the Engineer's Estimate is accurate and an effective tool for evaluating highway construction bids. FHWA concurred with two recommendations and partially concurred with the other two. We consider all four recommendations resolved but open pending completion of planned actions.

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All OIG audit reports are available on our website at [www.oig.dot.gov](http://www.oig.dot.gov).

For inquiries about this report, please contact our Office of Legal, Legislative, and External Affairs at (202) 366-8751.

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## Memorandum

Date: March 13, 2019

Subject: FHWA Lacks Adequate Oversight and Guidance for Engineer's Estimates | Report No. ST2019020

From: Barry J. DeWeese  
Assistant Inspector General for Surface Transportation Audits 

To: Federal Highway Administrator

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The Federal Highway Administration (FHWA) oversees more than \$40 billion a year in Federal funding for thousands of highway and bridge projects. At the start of a project, a State Department of Transportation (State DOT) develops a conceptual cost estimate, which is refined as the project advances. The cost estimate prepared at the final design stage is referred to as the Engineer's Estimate and is used to authorize the project's Federal funding prior to the project's bid solicitation and construction. For each federally funded project, Title 23 of the Code of Federal Regulations (CFR), Part 630, §106 requires a formal project agreement that is supported by the State's best estimate of the costs. FHWA's approval of the agreement creates an obligation of Federal funds.

According to FHWA's 2004 Guidance,<sup>1</sup> underestimating can cause project delays while additional funding is obtained to meet the increased contract costs. Conversely, overestimating causes an inefficient use of funds since they have already been obligated and are not available for other projects. In either case, the Federal-aid highway program can be negatively affected. In response to a 2012 OIG audit report,<sup>2</sup> FHWA conducted a National Review<sup>3</sup> and issued its report in February 2015. This report made six key recommendations to improve States'

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<sup>1</sup> *Guidelines on Preparing Engineer's Estimate, Bid Reviews, and Evaluation*, dated January 20, 2004.

<sup>2</sup> *FHWA Has Opportunities To Improve Oversight of ARRA High Dollar Projects and the Federal-Aid Highway Program* (OIG Report Number MH-2013-012), November 14, 2012. OIG reports are available on our website: <https://www.oig.dot.gov/>.

<sup>3</sup> *National Review of State Cost Estimation Practice*, February 2015. We refer to this report as the "2015 National Review."

cost-estimating procedures, which FHWA relies on to make the initial obligation of Federal funds for a project.

We appreciate the courtesies and cooperation of Department of Transportation representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-1302 or Jaydeep Borwankar, Program Director, at (202) 493-0970.

cc: The Secretary  
DOT Audit Liaison, M-1  
FHWA Audit Liaison, HCFB-32

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## Results in Brief

### **FHWA has made limited progress in implementing its key recommendations from the 2015 National Review.**

FHWA has implemented only one of the six key recommendations from its 2015 National Review aimed to improve State cost estimation practices. Two of the six recommendations called for FHWA to develop national cost estimation training and update the 2004 Guidance. The Agency's Division Offices were responsible for the remaining four recommendations, which focus on oversight. However, nearly 4 years after the 2015 National Review was issued, FHWA has yet to develop national cost estimation training or update its 2004 Guidance to address rapidly changing market conditions, as recommended. Additionally, based on our survey of 12 of 51 sampled Division Offices, they have implemented the other 4 key recommendations to various degrees. For example, four Division Offices reported conducting periodic reviews of State cost estimation procedures, while seven reported that their States use AASHTO's *Practical Guide to Cost Estimating* to ensure their process adequately addresses all necessary components for reliable cost-estimating practices. This mixed progress can be attributed in part to FHWA's lack of oversight. Specifically, since February 2015, FHWA has not set target action dates or followed up to determine whether and how its Division Offices were progressing on the key recommendations. As a result, FHWA does not know whether it has achieved the intended benefits of the recommendations.

### **FHWA lacks adequate guidance to oversee and monitor the accuracy of Engineer's Estimates.**

FHWA's 2004 Guidance is out of date and inadequate. For example, FHWA has not evaluated its threshold for measuring the accuracy of Engineer's Estimates it established in the early 1980s. The guidance does not include a numerical formula for calculating the Agency's threshold, which has led to misinterpretations and miscalculations. It also does not account for more recent project delivery approaches, such as design-build, and lacks information about contingencies and inflation. Finally, FHWA does not monitor the use of its threshold for measuring the accuracy of the Engineer's Estimate. As a result, the Agency has little to no assurance that the threshold established by the guidance for accuracy of the Engineer's Estimates is currently valid or that it can serve as an effective tool for evaluating bids received.

We are making recommendations to enhance FHWA's oversight and help ensure that the Engineer's Estimates are accurate, reliable, and an effective tool for evaluating highway construction bids.

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# Background

As stated in 23 CFR, Part 630, §205, an Engineer's Estimate shall reflect the anticipated cost of the project in sufficient detail to provide an initial prediction of the financial obligations to be incurred by the State and FHWA and to permit an effective review and comparison of contractor bids received for a project. Additionally, 23 CFR, Part 630, §106 requires that States develop a best estimate of costs when requesting Federal funds. Therefore, the accuracy of Engineer's Estimates is both material and required by FHWA regulations.

FHWA has been challenged for many years in ensuring the accuracy of States' Engineer's Estimates. As far back as 1984, an OIG audit report noted that FHWA did not adequately review States' cost-estimating activities, which resulted in inflated Engineer's Estimates that were not reliable for evaluating bids.

Since then, several audit reports have also identified shortcomings in FHWA's oversight of Engineer's Estimates. In a 2012 audit report,<sup>4</sup> we recommended that FHWA verify that its Division Offices review State procedures for estimating costs, including procedures to conduct periodic reviews and address significant changes in market conditions. In response, FHWA conducted a National Review and issued its report in February 2015, which included six key recommendations (see below).

## 2015 National Review of State Cost Estimation Practice Report: Key Recommendations

- FHWA should work with AASHTO's Technical Committee on Cost Estimation to develop national training consistent with AASHTO's *Practical Guide to Cost Estimating*. The training should target competency levels and be available in a variety of formats to maximize participation and access.
- FHWA Headquarters should update its *Guidelines on Preparing Engineer's Estimate, Bid Reviews and Evaluation* (January 2004) to include procedures to assess the competitive bidding environment during rapidly changing market conditions. [Note: we refer to this document as FHWA's 2004 Guidance throughout this report.]
- As Divisions assess their State DOTs' documented process for cost estimation, they are encouraged to use AASHTO's *Practical Guide to Cost*

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<sup>4</sup> FHWA Has Opportunities To Improve Oversight of ARRA High Dollar Projects and the Federal-Aid Highway Program (OIG Report Number MH-2013-012), November 14, 2012.

*Estimating* to ensure the process adequately addresses all necessary components for reliable cost-estimating practices.

- Consistent with [FHWA's] Risk-Based Stewardship and Oversight principles, FHWA Division Offices should conduct periodic reviews of State DOTs' cost-estimating procedures to verify the procedures address key recommendations from this report, including that they adequately address the competitive bidding environment as a result of changed market conditions.
- Divisions should work with their State DOTs to maintain the confidentiality of the Engineer's Estimate up to award to ensure competition.
- Divisions should work with their State DOTs to establish methods to evaluate bids so that significant differences can be understood and provide a better comparison.

According to FHWA, the 2015 National Review was conducted to increase the consistency and accuracy of the cost estimation process by improving the competency of FHWA, State, and local agency cost estimators through training and other activities. Two key recommendations—aimed at developing nationwide cost estimation training and updating the Agency's 2004 Guidance with procedures for assessing the competitive bidding environment during rapidly changing market conditions—were directed at FHWA Headquarters. The other four key recommendations, which focused on FHWA's oversight of State cost estimation practices, were directed at the Agency's Division Offices. FHWA officials acknowledged the benefits of implementing these key recommendations and developed an action plan to implement some of them.

FHWA's 2004 Guidance states the Engineer's Estimate should be within +/- 10 percent of the winning low bid for at least 50 percent of the projects over a period of time, such as a year.<sup>5</sup> According to FHWA's guidance, if this threshold for accuracy is not being achieved, confidence in the Engineer's Estimate may decline. FHWA's guidance also included several details about the importance, purpose, and use of the Engineer's Estimates, which underscore the importance of implementing the key recommendations from FHWA's 2015 National Review. For example, FHWA's guidance states that:

- The Engineer's Estimate serves as the benchmark for analyzing bids and is an essential element in the project approval process.

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<sup>5</sup> FHWA's guidance offers this information for measuring the accuracy of Engineer's Estimates, and we refer to it as the Agency's threshold for doing so.



- The critical review of any bid depends on the reliability of the estimate it is being compared to.
- Estimate accuracy should be judged by comparing the estimate against the low bid.

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## FHWA Has Made Limited Progress on Its 2015 National Review Key Recommendations

In February 2015, FHWA issued its National Review, which made six key recommendations for improving State cost estimation procedures. Two of the six recommendations recommended that FHWA develop national cost estimation training and update the 2004 Guidance. The Agency's Division Offices were responsible for the remaining four recommendations, which focus on oversight.

The 2015 National Review recommended that FHWA work with AASHTO's Technical Committee on Cost Estimation to develop national training consistent with AASHTO's *Practical Guide to Cost Estimating*<sup>6</sup> and make it available in a variety of formats to maximize participation. FHWA committed to developing this training in 2015, and in 2016, it established a panel with AASHTO to develop the training outline. FHWA officials told us they awarded a contract in August 2017 to develop the course content. Additionally, FHWA officials plan to award a separate contract to develop the various formats, such as web-based training or an eBook. Thus, the training will not be available before March 2019 or over 4 years after the recommendation was made.

Another key recommendation was to update the 2004 Guidance with procedures for assessing the competitive bidding environment during rapidly changing market conditions. FHWA did not begin this process until March 2017 and has yet to issue the updated guidance. FHWA officials cited limited resources and competing priorities as factors contributing to the delay.

To determine the status of the 4 key recommendations directed at the FHWA Division Offices, we surveyed 12 statistically selected Division Offices. Table 1 presents the status of these key recommendations at the time of our audit.

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<sup>6</sup> AASHTO's guidance was published in 2013, and according to FHWA, it provides basic and essential information critical to the estimate-development process and is a highly recommended resource for FHWA and State DOT officials.

Table 1. Status of Key Recommendations Directed at the Division Offices

Abbreviated Recommendation	Status of Implementation	Number of Division Offices
Use AASHTO's cost estimating guide.	Partial	7 of 12
Conduct periodic reviews of State cost estimating procedures.	Partial	4 of 12
Work with States to maintain estimate confidentiality up to award.	Partial	9 of 12
Work with States to develop methods for evaluating bids.	Full	12 of 12

Source: OIG analysis of survey results (12 of 51 FHWA Division Offices)

FHWA Headquarters distributed the 2015 National Review to the Division Offices, but did not follow up to determine whether and how the Division Offices were progressing, assign oversight responsibility, or set target action dates. This lack of oversight caused some Division Offices not to communicate the findings and key recommendations from the 2015 National Review to their State DOT counterparts. None of the State DOT officials at the three sites we visited could confirm receiving any such correspondence from their FHWA Division Offices. Specifically:

- Officials at one State DOT said the first time they saw the 2015 National Review was when OIG supplied it to them.
- Officials at a different State DOT told us that they only learned about the 2015 National Review approximately one week before our site visit.
- At another State DOT, officials were not aware of the 2015 National Review.

A program official at FHWA Headquarters told us it was unclear who was responsible for tracking these recommendations and that as a result, no follow-up took place. Another Headquarters program official suggested that possibly FHWA's Directors of Field Services (DFS)<sup>7</sup> should have tracked these recommendations. However, the DFS informed us that this directive was never communicated to them by Headquarters. While there was no specific statutory or regulatory requirement to implement the key recommendations, they were aimed

<sup>7</sup> The 4 Directors of Field Services each oversee 13 Division Offices.

at increasing the consistency and accuracy of the cost estimation process, according to FHWA. Further, FHWA Headquarters program officials agreed that implementing these key recommendations would result in more accurate estimates. However, such intended benefits are realized through the implementation of the key recommendations. FHWA Headquarters program officials further agreed that assigning responsibility and establishing target action dates would facilitate the implementation of these key recommendations.

The lack of a national training program, the outdated guidance, and the Division Offices' limited implementation of the key recommendations could adversely impact the accuracy and reliability of the estimates that are used to evaluate bids. As a result, FHWA has little to no assurance that it has realized the intended benefits of the recommendations.

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## FHWA Lacks Adequate Guidance To Monitor the Accuracy of Engineer's Estimates

FHWA has not evaluated the threshold contained in its guidance for measuring the accuracy of the Engineer's Estimate since it was introduced in the early 1980s. While the guidance defines a threshold the Division Offices can use to calculate the accuracy of Engineer's Estimates, it lacks a numerical formula to do so. Furthermore, FHWA's guidance has not kept pace with more recent project delivery approaches or other information critical for ensuring estimate accuracy. Finally, FHWA is not monitoring the use of the threshold contained in its guidance for measuring estimate accuracy as it has done in the past.

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## FHWA's 2004 Guidance Is Out of Date and Lacks a Validated Threshold To Assess the Accuracy of Engineer's Estimates

FHWA's 2004 Guidance includes a threshold that has not been updated since the early 1980s, and therefore it may not be the most effective tool for measuring the accuracy of Engineer's Estimates and evaluating bids received. FHWA officials acknowledge they do not know the basis for the threshold, even though it has been the Agency's sole quantitative threshold for measuring estimate accuracy for almost 40 years. Additionally, although the guidance clearly states that Division Offices should assess accuracy by comparing Engineer's Estimates to the winning low bids, it lacks a numerical formula for performing this calculation. This

has led to misinterpretations of the guidance and miscalculations of the threshold contained in the guidance. Only 1 of the 12 surveyed Division Offices uses FHWA’s guidance as intended for assessing the accuracy of Engineer’s Estimates.

Additionally, according to FHWA’s guidance and threshold, estimate accuracy should be judged by comparing the Engineer’s Estimate against the low bid. However, the three Division Offices we visited compare the low bid against the Engineer’s Estimate, which provides a materially different result. As an example, a project in our review was overestimated by about 41 percent using FHWA’s guidance, but the State DOT and the Division Office compared the low bid against the Engineer’s Estimate, which resulted in a deviation of approximately –29 percent (see table 2).

Table 2. Comparison of the Division Office and 2004 Guidance Formulas for Assessing the Accuracy of Engineer’s Estimates

Sample Project	Engineer’s Estimate (EE)	Winning Low Bid (WLB)	2004 Guidance Formula	Division Office Formula
Idaho	\$4,169,063	\$3,129,588	$\frac{\$4,169,063 - \$3,129,588}{\$3,129,588} = 33.21\%$	$\frac{\$3,129,588 - \$4,169,063}{\$4,169,063} = -24.93\%$
Texas	\$10,819,330	\$7,686,119	$\frac{\$10,819,330 - \$7,686,119}{\$7,686,119} = 40.76\%$	$\frac{\$7,686,119 - \$10,819,330}{\$10,819,330} = -28.96\%$
Virginia <sup>8</sup>	EE*	WLB*	$\frac{EE - WLB}{WLB} = 70.96\%$	$\frac{WLB - EE}{EE} = -41.51\%$

Source: OIG analysis of FHWA-provided data

During our site visits, we asked staff at the Division Offices why they did not follow the Agency’s threshold stated in its 2004 Guidance. Staff at one Division Office told us their formula was more appropriate than the Agency’s for evaluating estimates and bids. Staff at the other two Division Offices stated that the description of the threshold in FHWA’s guidance was “poorly written” and “unclear.” As a result, FHWA has little to no assurance that the threshold is an effective mechanism for measuring the accuracy of Engineer’s Estimates and evaluating bids.

In addition, FHWA’s guidance has not kept pace with more recent project delivery approaches, such as construction manager/general contractor and design-build. These approaches often call for a different method for estimating costs and allow State DOTs to consider other factors besides lowest price when awarding a

<sup>8</sup> Engineer’s Estimates are protected by State law in Virginia and are not published or released to the public. As such, the specific project values have not been included.

contract. The guidance also lacks information about contingencies and inflation, and State DOTs use these factors inconsistently. According to our survey:

- 2 States do not define contingency as part of their cost estimation process;
- 5 States do not account for inflation when they develop Engineer's Estimates, and 1 Division Office did not know whether or not its State DOT accounted for inflation;
- Staff at 6 of the 12 Division Offices stated that adding information about contingencies to the guidance would be helpful.

In its 2015 National Review, FHWA reported that half of the States do not have a clear definition of contingency and what it represents. As a result, the review found that State DOTs may be assuming unnecessary risk in the estimate development process.

FHWA officials acknowledge that the threshold included in the 2004 Guidance was not as clear as it could have been. During the course of our audit, we shared these shortcomings with FHWA program officials, and they agreed to account for them as a part of the Agency's ongoing effort to update the guidance. However, the Agency has not provided an issuance date for the updated guidance. Additionally, at the end of our audit, FHWA program officials informed us that they may eliminate the threshold altogether. In our view, whether FHWA determines to evaluate and keep its threshold or eliminate it altogether, the Agency still needs a robust oversight mechanism to help ensure that the Engineer's Estimates are accurate, reliable, and an effective tool for evaluating highway construction bids.

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## **FHWA Is Not Monitoring State DOTs' Performance Against Its Threshold**

FHWA Headquarters used to monitor the States' performance against its threshold for measuring the accuracy of Engineer's Estimates. However, according to FHWA Headquarters program officials, the Agency stopped that initiative in May 2007 due to lack of resources. FHWA's 2004 Guidance states that the Engineer's Estimate should be within +/- 10 percent of the winning low bid for at least 50 percent of the projects over a period of time, such as a year. FHWA's 2004 Guidance introduced this quantitative threshold for measuring the accuracy of Engineer's Estimates. Our survey found that only 1 of the 12 sampled FHWA Division Offices is monitoring its State DOT's performance in accordance with the 2004 Guidance. Without monitoring the State DOTs' performance against the Agency's threshold—as FHWA has done in the past—FHWA has little

to no assurance that the States are meeting its threshold for accuracy of Engineer's Estimates.

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## Conclusion

FHWA oversees more than \$40 billion a year in Federal funding for thousands of highway and bridge projects. A key part of FHWA's oversight is ensuring that State and local partners employ effective competitive procurement practices to achieve the best value and deter fraud, waste and abuse, and deploy Federal funds effectively to address critical infrastructure improvements. A fundamental component of this is Engineer's Estimates that reflect a fair and reasonable cost of the projects to commit Federal funds and to provide a reasonable baseline to evaluate and compare bids received for a project. However, delays in FHWA implementing several of its recommendations made in its 2015 National Review, and a lack of adequate guidance and effective monitoring, lessens the assurance that the State and local partners are providing consistent and accurate cost estimations.

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## Recommendations

To ensure that Engineer's Estimates are an effective tool for evaluating highway construction bids, we recommend that the Federal Highway Administrator:

1. Develop and implement an action plan that establishes target action dates and assigns responsibility for following up on the key recommendations from the *2015 National Review of State Cost Estimation Practice*.
2. Update FHWA's *Guidelines on Preparing Engineer's Estimate, Bid Reviews, and Evaluation* (2004 Guidance) to include:
  - a. Estimating guidance for more recent project delivery methods, such as design-build and construction manager/general contractor.
  - b. Guidelines to account for contingencies and inflation when developing Engineer's Estimates.
3. Assess the validity and applicability of the threshold in FHWA's 2004 Guidance that is used to measure the accuracy of Engineer's Estimates.
4. Develop and implement an oversight process for Engineer's Estimates that assesses whether States are following FHWA's guidance and thresholds.

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## Agency Comments and OIG Response

We provided FHWA with our draft report on December 4, 2018, and on February 15, 2019, received its formal response, which is included in its entirety as an appendix to this report. FHWA concurred with recommendations 1 and 2 as written, partially concurred with recommendations 3 and 4, and provided completion dates for all four.

For recommendation 3, FHWA stated that it is considering other indicators used by States that may be more effective, which may negate the need to update the threshold in the 2004 Guidance. We acknowledge that FHWA is entitled to consider other thresholds or indicators and therefore consider the Agency's proposed actions to be responsive to our recommendation. However, we also encourage the Agency, as a part of its evaluation, to assess whether such thresholds or indicators can serve as an effective mechanism for measuring the accuracy of Engineer's Estimates and evaluating bids—the intent of our recommendation.

For recommendation 4, the Agency stated that it will develop a risk-based oversight process for Engineer's Estimates, instead of providing the same level of monitoring for every State. Furthermore, FHWA stated that it will determine its level of oversight based on a survey of its Division Offices to determine the current state of practice across State DOTs and risks identified, if any. We acknowledge that FHWA's risk-based approach would provide a reasonable basis for overseeing Engineer's Estimates and therefore consider the Agency's proposed actions to be responsive to our recommendation. However, we also encourage FHWA to incorporate the data provided by its threshold(s) or indicator(s) into the survey, which will provide a stronger basis for its risk-based oversight process.

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## Actions Required

We consider recommendations 1 through 4 resolved but open pending completion of the planned actions.

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## Exhibit A. Scope and Methodology

We conducted this performance audit between July 2017 and December 2018 in accordance with generally accepted Government auditing standards as prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The scope of our audit was to evaluate FHWA's oversight of Engineer's Estimates. Specifically, we assessed (1) FHWA's progress in implementing key recommendations from the Agency's *2015 National Review of State Cost Estimation Practice*, and (2) FHWA's *Guidelines on Preparing Engineer's Estimate*, including monitoring the accuracy of the estimates prepared by the States.

FHWA has 52 Division Offices (one in each State, the District of Columbia, and Puerto Rico). We worked with OIG's Chief Statistician to develop a statistical sample of 12 FHWA Division Offices for our review. To develop the sample universe, we collected each State's fiscal year 2017 FHWA apportionment data for a total of \$40.5 billion. We stratified the universe of FHWA Division Offices representing 50 States and the District of Columbia—a total of 51 Division Offices—into three strata, each stratum accounting for approximately 33 percent of the total apportionment amount. We computed stratum sample sizes proportionately based on the number of States in each stratum. We adjusted the stratum sample sizes slightly so that all five States with the highest apportionment over \$1 billion were selected for stratum 1.

To assess FHWA's oversight of Engineer's Estimates, we reviewed Federal laws, regulations, and prior OIG and GAO audit reports; FHWA's 2015 National Review; FHWA's 2004 Guidance; and other relevant FHWA's policies, procedures, and guidance. We also consulted with OIG's Engineering Services Manager, Associate Counsel, and other specialists as appropriate. Additionally, we interviewed relevant FHWA program officials, the AASHTO Technical Committee on Cost Estimation, and all of FHWA's Directors of Field Services.

We conducted surveys with all 12 sampled FHWA Division Offices and conducted follow-up interviews about the implementation status of the key recommendations from the 2015 National Review and their understanding and interpretation of FHWA's 2004 Guidance, among other things. We also conducted site visits to three of the sampled Division Offices and their respective State DOTs (Idaho, Texas, and Virginia). These Division Offices were chosen because they were the first randomly selected from each stratum. Based on our survey results,



we determined the implementation status of the key recommendations from FHWA's 2015 National Review and how many Division Offices collect and analyze bid tabulation data in accordance with FHWA's 2004 Guidance.

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## **Exhibit B.** Organizations Visited or Contacted

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### **FHWA Facilities**

Federal Highway Administration Headquarters, Washington, DC

FHWA California Division Office

FHWA Florida Division Office

FHWA Georgia Division Office

FHWA Idaho Division Office

FHWA Kentucky Division Office

FHWA Louisiana Division Office

FHWA New Hampshire Division Office

FHWA New York Division Office

FHWA Pennsylvania Division Office

FHWA Texas Division Office

FHWA Utah Division Office

FHWA Virginia Division Office

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### **State Departments of Transportation**

Idaho Transportation Department

Texas Department of Transportation

Virginia Department of Transportation

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### **Other Organizations**

AASHTO Technical Committee on Cost Estimation, Washington, DC

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## Exhibit C. List of Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ARRA	American Recovery and Reinvestment Act of 2009
CFR	Code of Federal Regulation
DOT	Department of Transportation
DFS	Directors of Field Services
FHWA	Federal Highway Administration
GAO	Government Accountability Office
OIG	Office of Inspector General
State DOT	State Department of Transportation

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## Exhibit D. Major Contributors to This Report

JAYDEEP BORWANKAR	PROGRAM DIRECTOR
MICHAEL MASOUDIAN	PROJECT MANAGER
CYNTHIA AUBURN	SENIOR ANALYST
JAMES LONERGAN	SENIOR FINANCIAL ANALYST
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PETRA SWARTZLANDER	SENIOR STATISTICIAN
MAKESI ORMOND	STATISTICIAN
JANE LUSAKA	WRITER-EDITOR
TOM DENOMME	PROJECT CONSULTANT
FRITZ SWARTZBAUGH	ASSOCIATE COUNSEL
CHRISTINA LEE	VISUAL COMMUNICATIONS SPECIALIST

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## Appendix. Agency Comments



U.S. Department  
of Transportation  
Federal Highway  
Administration

# Memorandum

Subject: **INFORMATION:** FHWA Management  
Response to the Office of Inspector  
General (OIG) Draft Report on  
Engineer's Estimates (17S3004S000)

Date: February 15, 2019

From: Brandye L. Hendrickson  
Deputy Administrator

In Reply Refer To:  
HCFB-30

To: Barry J. DeWeese  
Assistant Inspector General  
for Surface Transportation Audits

The Federal Highway Administration (FHWA) safeguards over \$40 billion annually in Federal-aid Highway Program (FAHP) funds for the construction and preservation of the Nation's highways and bridges. As stewards of these funds, we work to promote competition and strengthen oversight of the bid process. We believe the OIG draft report should include additional context, specifically regarding the purpose, use, and controls of engineer's estimates. The FHWA offers the following comments regarding OIG's draft report findings:

- **Purpose:** Engineer's estimates reflect the anticipated cost of the project in sufficient detail to provide an initial prediction of the financial obligations to be incurred by the State and FHWA. However, the obligated amount is typically adjusted after concurrence in award. Engineer's estimates permit an effective review and comparison of the bids received. The engineer's estimates are one of several estimates used during project development. Others include planning estimates, such as preliminary or conceptual estimates; scoping estimates that serve as baseline estimates for the Statewide Transportation Improvement Plan (STIP) and Transportation Improvement Plan (TIP); and design estimates for managing a project's budget.
- **Use:** The FHWA's current *Guidelines on Preparing Engineer's Estimates, Bid Reviews, and Evaluations* is based on best practices. The threshold cited in the guidelines is a general parameter used to gauge and adjust the engineer's estimates from year to year and to promote consistency in their use within a State. Adherence to the guidelines is not required by statute or regulation, and there is no statute or regulation specifying thresholds, review criteria, or project specific acceptance

criteria. The FHWA is working with internal and external stakeholder groups, including the American Association of State Highway and Transportation Officials, to update these guidelines to include information about more recent project delivery mechanisms.

- **Control:** States use the engineer's estimate for the initial construction authorization, but subsequent payments are based on actual costs incurred per the contractor's bid documentation, not the engineer's estimate. Part 630 of Title 23 of the Code of Federal Regulations (CFR) requires that States maintain procedures to adjust project cost estimates in the project agreement, including downward adjustments of obligations if costs decrease by \$250,000. Many States also revise the agreement amount after contract award.

Also, States have incentives to generate accurate estimates. The annual Federal-aid allocation to a State is a fixed amount. States do not receive additional Federal funding when a project has cost overruns. In addition, State budgetary and programming processes depend on all estimates. The STIP/TIP estimates are financially constrained and are used in the States' budgeting process. Overestimating of the engineer's estimate by the State would result in a more limited number of projects in the State's program, whereas underestimating the engineer's estimate would result in budget shortfalls.

We concur with recommendations 1 and 2 as written. We partially concur with recommendation 3. The FHWA is considering other indicators used by states that may be more effective, which may negate the need to update the current thresholds in the guidelines. We also partially concur with recommendation 4. The FHWA agrees with developing and implementing an oversight process for engineer's estimates. FHWA will develop a risk-based oversight process, instead of providing the same level monitoring for every state. We will determine our level of effort based on the survey results of our Divisions to determine the current state of practice across the State DOTs and risks identified, if any. We plan to implement all recommendations by June 30, 2020.

We appreciate the opportunity to review the OIG draft report. If you have any questions, please contact Derrell E. Turner, Acting Associate Administrator for Infrastructure, at 202-366-0370.

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