

Updating Fuel Factors for Today's Construction Projects



REAL-WORLD NEED

Contractor bids for highway and bridge construction must include costs for labor, materials, and equipment, and fuel costs for every fuel-consuming activity. To minimize the risk associated with fuel price fluctuations, many agencies allow payment adjustments to contractors if fuel prices fluctuate more than a set amount over the life of a contract. To help agencies accurately calculate these adjustments, in 1980 FHWA issued fuel usage factor directives that estimated the amount of fuel used by a variety of construction activities. However, these fuel usage factors were based on activity in 1974, before bridge removal and other rehabilitation activities became common. It was time to update fuel usage factors for today's construction activities.

RESEARCH SOLUTION

Investigators updated fuel usage factors by surveying state transportation agencies and contractors, conducting statistical analysis of construction pay items, and assembling an expert panel to determine the estimated fuel demands of various construction activities. This study produced over 1,000 new fuel usage factors and guidance on implementing them, along with a tool for calculating factors for specific contracts and situations. This will help transportation agencies let more accurate contracts that require fewer adjustments and payouts after construction.

NEXT STEPS Implement a Pilot

IDENTIFY

Identify a construction or rehabilitation project with multiple fuel-consuming activities.

APPLY

Use *NCHRP Report 744* to identify new fuel usage factors and fuel prices per your agency's approved fuel price index.

CALCULATE

Use the *Price Adjustment Calculator Tool* from Appendix C of *NCHRP Report 744* to calculate price adjustments for your agency's contract-specific items.

ENGAGE

Collaborate with construction partners to test new fuel usage factors.

About the Research

RESEARCH STRATEGY

This project reset fuel usage factors by identifying the major fuel-consuming highway construction activities in contemporary construction practices through a survey of transportation agencies in all 50 states. The researchers determined which states use fuel factors, how often they update them, and what challenges they see in using them. The researchers then invited over 10,000 contractors from large and small construction firms around the country to provide information about what construction activities use fuel and how firms estimate these costs. Finally, they selected an expert panel to determine estimated fuel demands of construction pay items, and conducted a statistical analysis of a large national database of pay items.

“Until this study, FHWA’s fuel usage factors were based on 1970s data. NCHRP Report 744 brought them up-to-date to reflect the fuel needs of the machines we use today.”

JONATHAN SKOLNIK

Principal Investigator, Jack Faucett Associates

WHAT WE LEARNED

Thirty-eight of 50 states use fuel factors, though many do not update them frequently. The majority had either not updated their fuel factors in the past six years or did not know when the factors were last updated. Fuel factors for bridges and structures are particularly challenging due to changes in construction methods, fuel intensity, and structure type, size, and complexity. With input from over 270 contractors, a panel of experts determined fuel usage per unit for over 1,000 construction activities.

WHY IT MATTERS

This project brought fuel usage factor guidance up-to-date with well-rounded, reliable adjustments to old fuel usage factors as well as the addition of new factors. These updates will help agencies improve fuel pricing estimates and reduce adjustments and payouts after construction. Contractors can make use of updated fuel usage factors, and agencies can apply the model specifications included in the report, with both sides saving time and money over the outdated methods previously available.

IMPLEMENTATION RESOURCES



NCHRP PROJECT 10-81

FINAL REPORT

NCHRP Report 744: Fuel Usage Factors in Highway and Bridge Construction
trb.org/Main/Blurbs/168693.aspx

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ADDITIONAL RESOURCES

FHWA Construction Contract Administration

www.fhwa.dot.gov/programadmin/contracts/

AASHTO Technical Committee on Cost Estimating (part of Subcommittee on Design)

design.transportation.org/Pages/CostEstimating.aspx

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