



Evaluation and Development of Cost Prediction Models for Resurfacing Projects to Improve M & R Analysis and Project Development

Problem Description

According to the ASCE's "2021 Report Card for America's Infrastructure", 43% of our public roadways are in poor condition [1]. Optimizing the use of state and federal funding is especially important because TDOT ranked 15th in terms of the largest distribution of Federal money for its highway program in 2014. Hence, TDOT needs a methodology and tool to accurately predict costs of resurfacing projects during the project development and M&R analysis that will aid TDOT engineers in selecting the best pavement resurfacing treatment type, prioritizing resurfacing project, and developing project bundling strategy that can increase the competition and decrease the project costs.

Research Objectives

- Identify, analyze, and quantify the impact of various factors – such as inflation, local competition, supplier's location, aggregate requirements, total contract size, project bundling, and resurfacing treatment type – on the resurfacing project cost using data from historical resurfacing projects such as project characteristics and bidding information.
- Develop, test, and validate a TDOT-specific accurate cost prediction models for resurfacing projects that accounts for relevant factors, such as project characteristics, that are available during the early phases of the project development.
- Develop a project bundling strategy and associated tool for resurfacing projects that has potential to increase the competition and decrease the construction cost.
- Prepare a guideline to integrate the methodologies and tools with project prioritization process.
- Disseminate the results of the study to TDOT engineers and to other state DOTs via meetings and conferences such as Transportation Research Board (TRB) Annual Meeting.

Potential Implementation and Expected Benefits

The research will identify the best practices of predicting quick and accurate resurfacing projects costs, strategy for prioritizing projects, and bundle projects to secure more competitive bids. It will consist of an extensive review of existing literature on the topic. A TDOT-specific automation tool will be developed to predict resurfacing project costs to improve M&R analysis and project development. The tool will utilize historical data and machine learning models. Recommendation to integrate the new estimating tool into existing workflow and business practices will be provided. The findings of the study will be shared with TDOT as well as other interested state DOTs.

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PRINCIPAL INVESTIGATOR:
Dr. Joseph Shrestha
East TN State University

TDOT LEAD STAFF:
Dr. Xiaoyang Jia
Maintenance Division

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