The Ohio Department of Transportation
Office of Research & Development
Executive Summary Report

Improved Models for User Cost Analysis

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Problem

The user costs include the costs borne by highway users such as additional travel time costs, crash costs, costs of operating vehicles in work zone conditions, and environmental costs. Traffic disruptions, accidents, local businesses disruptions, increased vehicle operating costs in terms of fuel consumption and vehicle repair costs, increased travel time, and pollution can lead to high user costs which can have a detrimental impact on the competitiveness of local and even national economies. It is very important to factor user costs in when making decisions on pavement design and construction strategies.

The Ohio Department of Transportation's focus on minimizing impact of construction on the users of infrastructure has resulted in formulation of policies such as Maintenance of Traffic Policy. The current pavement type selection process used by the Ohio Department of Transportation considers user costs indirectly in the form of user delay days, which don't involve quantification of user delay. It is a comparison of number of days required for construction and rehabilitation of various alternatives. It is important to gauge the economic impact of the delays created by construction work zones and incorporate it in the decision making process when selecting the pavement construction alternative.

Objectives

The main objective of the study was to identify methods for including user costs in the pavement type selection process currently used by ODOT.

Description

The study included a comprehensive review of research literature. The software tools used for quantifying and monetizing various components of user costs were reviewed. A comprehensive questionnaire survey of US and Canadian transportation agencies was carried out to identify the state of art regarding the use of user costs in pavement type selection processes. The pavement type selection process currently used by ODOT and the maintenance of traffic policy were studied. On the basis of review of research literature, software tools and results of questionnaire survey, two alternative approaches for including monetized user costs in the pavement type selection process were developed. Two case studies of pavement type selection processes illustrating the use of these approaches in two ODOT pavement construction projects have been presented.

Conclusions & Recommendations

There is an increasing awareness in the transportation community about including user costs in the pavement type selection decision making process. Of the 22 state transportation agencies surveyed as a part of this research project, 8 include user costs quantitatively as a part of their pavement type selection process while 12 plan to do so in near future. The main components of user costs include user delay and the additional vehicle operating costs in work zones. Over last 50 years a significant research effort has been put into identifying and quantifying user costs.

The current pavement type selection process used by the Ohio Department of Transportation only involves a comparison of number of days required for construction and rehabilitation of various alternatives. This process can be improved upon by quantifying user costs and using the monetized user costs in pavement type selection process. The user costs can be introduced seamlessly into the current ODOT pavement type selection process.

This can be achieved by using either of two approaches developed in this study. The first approach includes the inclusion of user costs in the life cycle costs. This approach is used by all the agencies surveyed in this study. The alternative approach includes comparison of user costs of pavement type alternatives that have equivalent life cycle costs. RealCost software, developed by FHWA can be used to quantify user costs.

Implementation Potential

The results of the study could be used to revamp the pavement type selection process currently used by ODOT. The pavement type selection process can be made more economically sound by including monetized user costs quantitatively in pavement type selection process. Two alternative approaches have been recommended in this study.