Kansas Department of Transportation

TECHNICAL SUMMARY

Evaluation of Interactive Highway Safety Design Model Crash Prediction Tools for Two-Lane Rural Roads on Kansas Department of Transportation Projects

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Highway 160. Photo by KDOT Support Services.

Introduction

Historically, project-level decisions for the selection of highway features to promote safety were based on either engineering judgment or adherence to accepted national guidance. These tools have allowed highway designers to produce facilities that have demonstrated an improving safety record in recent decades. However, these tools do not allow for comparison of the safety performance of dissimilar facilities or roadway attributes. To address this gap, researchers have been working for decades to develop Crash Prediction Models (CPMs) that can estimate, and ideally predict the expected safety performance of a highway based on its geometric and traffic control features.

Project Objective

The main focus of this research was to evaluate the use of CPMs for rural two-lane highways in Kansas. Both CPMs provided in the Highway Safety Manual (HSM) and ones developed specifically based on Kansas data were considered.

Project Results

Many useful insights and tools were developed through this research study that focused on non-intersection related crashes. The primary conclusions were that single statewide calibration factors were calculated and recommended for rural two-lane highway segments and 3- and 4-leg stopped controlled intersections. A calibration function was also developed for highway segments that can be used to better account for animal crashes, which account for a significant number of rural two-lane highway crashes.

The most significant finding of this research relative to national application of the HSM CPM, is the fundamental definition of what sections qualify as rural. Those looking to apply the HSM CPM in the future could benefit from determination of the impact of this finding on previous studies and/or from confirmation of this discrepancy in other jurisdictions.

Similarly, future research could also benefit from identifying how highways through small communities should be modeled. Specifically, it should be determined if modifications can be made to the rural two-lane model so these road can be analyzed, or do these roads perform in a way that is more consistent with the urban/suburban arterial model. It is also unknown if the higher crash rates along these relatively short sections of highway can skew analysis that groups them with rural sections that have no portion through a community.

Since the alternative method for calibrating the HSM CPM improved the accuracy of the CPM for Kansas, it should be considered for use by other jurisdictions. This method could prove especially helpful for jurisdictions that have a significant cause of crashes that is not considered by the HSM CPM and is not related to the roadway geometry or traffic control.

Report Information

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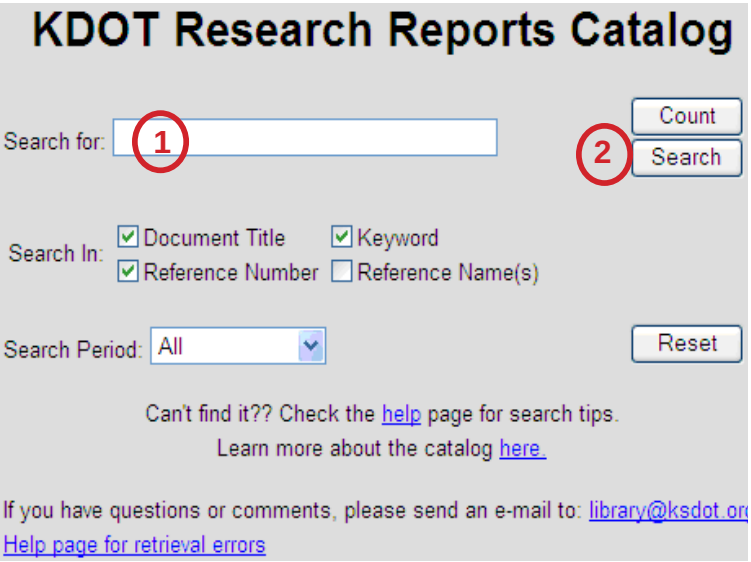

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