

I. RESEARCH PROJECT TITLE

Calibrating the HSM Rural Multi-lane Model for Kansas Highways

II. RESEARCH PROBLEM STATEMENT

Even though the Highway Safety Manual (HSM) provides models for analyzing different types of highways, they have been developed based on national trends and statistics. Accordingly the models are limited if they are not calibrated for individual jurisdictions or local conditions. KDOT has been able to apply the rural two-lane model thoroughly since a K-TRAN project was completed to calibrate it. However, there have been times when analysis of a multi-lane facility is requested but cannot be completed without the calibration. This research would go through the recommended procedure for calibrating the rural multilane model and develop KDOT specific calibration values.

III. RESEARCH OBJECTIVES

The main objective of this study is to calibrate the rural multilane model provided in the Highway Safety Manual (or any other appropriate model) for Kansas conditions.

Following major tasks will be completed in accomplishing the above objective.

Task 1: Literature Review and Evaluation of Methodologies

Conduct a detailed literature review by searching popular transportation databases such as TRID online and TRB Research-In-Progress database. Quick review indicated that several states have completed research projects to calibrate HSM predictive models and many other states have on-going projects. These will be reviewed to get an understanding of the methodologies that have been utilized and findings have been made throughout the country on the subject topic. Literature on the HSM multilane rural multilane highway model and other similar published models will be reviewed.

Task 2: Evaluate the Applicability of the Models

HSM rural Multilane Highways predictive method available in Chapter 11 of HSM and other available models will be evaluated for the applicability in Kansas highways. Most appropriate model suitable for Kansas conditions will be selected based on this task.

Task 3: Gather Necessary Data

The calibration of models is data intensive and all necessary data to calibrate the selected models will be gathered. Data will be collected for relevant categories of highway site types covered under the HSM, which are under two broad categories of roadway segments and intersections.

Task 4: Perform Calibration

Using the data collected in Task 3 perform the appropriate calibration procedure for the selected model. Subject to data availability, models will be calibrated for rural 4-lane undivided segments, rural 4-lane divided segments, and at least one type of intersection covered by Chapter 11.

Task 5: Provide Recommendations

Make a recommendation on the application of the calibrated model against a future need to develop new SPF for Kansas highways.

Task 6: Report Preparation

Document all the tasks of the project in a final report.

IV. ESTIMATE OF FUNDING AND RESEARCH PERIOD

Research Period: 24 months from the beginning of the project.

Funding: Estimated project cost is \$ 65,000.

V. URGENCY AND PAYOFF POTENTIAL

As the agency focuses on cost effectiveness the HSM has been an asset to evaluate getting the most safety improvement benefit for a limited amount of dollars.

VI. IMPLEMENTATION STRATEGY

Findings of this research will be available for KDOT engineers to make more accurate decisions on where the improvements are needed. With the information developed in this study KDOT can use the calibrated HSM predictive methods to assess expected facility performance for Kansas Conditions and facility alternatives.

VII. PROJECT PERSONNEL

The principal investigator of this project will be Dr. Sunanda Dissanayake (Associate Professor of Civil Engineering) who has many years of experience in the areas of traffic engineering, highway safety, crash data analysis, and special population groups. One Graduate Research Assistant will also work on this project whose master thesis will be focused on this study.

VIII. SUBMISSION INFORMATION

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