

I. RESEARCH PROJECT TITLE

Keeping Vehicles on the Roadway in Rural Areas: Analysis of Run-off-the-Road Crashes

II. RESEARCH PROBLEM STATEMENT

One of the previously completed KSUTC projects, Recommended Rural Transportation Safety Program for the 21st Century¹, identified the areas that can guide the rural transportation safety research program at KSUTC. While the first three highly ranked issues are either being studied and/or needs more education/enforcement related measures, fourth ranked focus area is proposed to be studied in detail in this study, which refers to keeping vehicles on roadways in rural areas. This is also one of the six key emphasis areas (lane departure) identified by the Kansas Strategic Highway Safety Plan(KSHSP) as having the biggest potential for reducing fatalities and serious injuries on Kansas roadways.

Run-off-the-Road (ROR) crashes are the ones in which a vehicle unintentionally departs from the road and then overturns or hits a fixed object. ROR crashes are a substantial portion of statewide motor vehicle crashes in Kansas particularly when it comes to fatal and serious injury crashes². Based on KSHSP, ROR crashes accounted for 55% of all crashes involving fatal and serious injuries and 22% of all crashes and majority of those occur in rural areas. This project is expected to study and analyze such rural ROR crashes and identify the human factors, geometric design features, driver behaviors and characteristics, vehicular maneuvers and characteristics, and environmental features that might have contributed to occurrence and higher severity of ROR crashes.

III. RESEARCH OBJECTIVES

The main objective of this study is to identify the factors that are associated with Run-off-the-Road (ROR) crashes thereby making it possible to identify more effective countermeasures to reduce number and severity of ROR crashes.

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

Task 1: Literature Review

Conduct a detailed literature review on ROR and lane departure related safety studies conducted throughout the country.

Task 2: Gather Data

Collect or extract all data related to crashes involving rural ROR crashes in Kansas. If the amount of details available in the electronic crash database is

¹ Stokes, R.W., Dissanayake, S., Russell, E., Rys, M.J. and Sullivan, K.L., Recommended Rural Transportation Safety Research Program for the 21st Century, Final Report, Kansas State University Transportation Center, Manhattan, KS, Sep. 2007.

² Kansas Department of Transportation, Kansas Strategic Highway Safety Plan, 2007.

insufficient, hard copies of crashes, particularly those of fatal crashes would be gathered. In addition, geometric characteristics of the roads relevant to this study will be obtained from the CANSYS database maintained by the Kansas Department of Transportation.

Task 3: Analyze Data

Analyze the data collected in Task 2 and identify potential problem areas, locations, and driver characteristics related to safety of rural roadways and ROR crashes in Kansas. While all characteristics will be identified, particular attention will be paid to identify the human factor related issues associated with ROR crashes. In addition, geometric design and roadway characteristics that need to be further studied will be identified with the intention of reducing ROR crashes in Kansas.

Develop the relationships between identified geometric design/roadway characteristics and ROR crashes at the location. This will mainly be carried out by conducting detailed statistical analyses. Statistical models (depending on the sample size available) will be developed to identify the factors that could reduce not only number of ROR crashes but also severity of ROR crashes.

Task 4: Develop Recommendations for Keeping Vehicles on the Roadway

Based on the knowledge gathered through the above tasks, develop appropriate recommendations whether they are educational, enforcement, and engineering countermeasures to reduce ROR crashes or to help keep the vehicles on roadways in rural areas.

Task 5: 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 \$ 119,972.

V. URGENCY AND PAYOFF POTENTIAL

With the disproportionate amount of ROR crashes related to fatal and serious injuries it is important to conduct a detailed investigation on ROR crashes and thereby develop ideas for keeping vehicles on roadways. When considering the very high economic costs associated with high severity crashes and the higher percentage of ROR crashes within the state, this project is expected to have a very high payoff potential. This is indicated by the selection of this issue in the six key areas of the KSHSP.

VI. IMPLEMENTATION STRATEGY

Based on the findings, the project will provide the recommendations for addressing transportation needs and improving safety of the Hispanic population in Kansas.

VII. PROJECT PERSONNEL

The principal investigator of this project will be Dr. Sunanda Dissanayake (Associate Professor in Civil Engineering) who has many years of experience in the areas of traffic engineering, safety, crash data analysis, special population groups, and access management related issues. One Graduate Research Assistant will work on this project whose thesis/dissertation would be focused on this study. Co-PIs of this project would be Drs. G. Russell, M. Rys, and R. Stokes.

VIII. SUBMISSION INFORMATION

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