

## **I. RESEARCH PROJECT TITLE**

Effectiveness of Larger Traffic Signs, High-Performance Sheeting and Clearview Font on Accident Reduction

## **II. RESEARCH PROBLEM STATEMENT**

During the last several decades, the number of drivers and rural/urban traffic has significantly increased, along with the number of traffic signs. Traffic signs provide a plethora of necessary information -- directions, guidance, warnings, regulations, and recreation. With today's congestion and higher speed, it's very important to recognize specific situations where larger, brighter, and easier to read signs should be installed to increase safety of the drivers. It is equally important to counties with limited funds to find locations and/or scenarios where bigger, more costly signs are not cost effective.

Many signing studies of problem locations recommend bigger, brighter, easier to read signs. However, there is little evidence that sign size, or readability directly relate to accident causation. Counties want evidence that larger, more costly signs are cost effective in regard to safety. A study of the other attributes can be made within this same project at little incremental cost with results made beneficial to both the state and counties. There is a need for documentation of the accident reduction benefits of these sign attributes for a range of approach scenarios and accident types.

## **III. RESEARCH OBJECTIVES**

The main objective of this research will be to determine typical locations and/or scenarios where bigger signs are effective in reducing accidents on rural/urban roads and where they are not effective, thus saving money for use at more critical locations. Within this study, a secondary objective will be to also study the safety benefits of brighter, easier to read signs. In regard to the "easier to read" attribute, an evaluation of the Clearview Font lettering will be conducted.

Many factors lend to the effectiveness of traffic signs: legibility distance, recognition time, conspicuity, comprehension, and learnability. Drivers must be able to detect, read, and understand a traffic sign in a short enough time or distance to react. Therefore, more effective traffic signs need to be installed at critical locations, which the study will determine to ensure the safety of drivers. Some of the factors that will be considered are: increasing the size of the signs, specifically increasing the size of the letters used on the signs and using the Type III retro-reflective sheeting (high performance) material. Some of the researchers suggest increasing letter height based on the assumption that an inch-high letter can be read at 40 ft rather than 50 ft. If a minimum legibility distance of 900 ft is assumed, this revised standard would result in 22.5-inch letters. Another way of improving sign performance/effectiveness is to increase conspicuity and/or install multiple signs. Sign conspicuity can be enhanced by using Type III retro-reflective sheeting (high performance sheeting), especially in areas where visual clutter occurs.

#### **IV. APPROACH**

This research will have a two phase approach: 1. laboratory and 2. accident records. In the laboratory, standard human factors techniques will be used on a wide range of subjects to determine/document benefits of a) bigger signs, b) brighter signs and c) Clearview font. Then, in addition to literature review of studies, accident records of specific locations where the only changes were a change in one of the three attributes being studied will be reviewed to determine if the attribute can be identified as a significant factor in accident reduction.

#### **V. TASKS**

- Literature review and survey of county sign use policy
- Develop laboratory study.
- Conduct laboratory study.
- Analyze data, write interim report.
- Identify appropriate field locations.
- Obtain data from field locations.
- Analyze data.
- Write and present draft report.
- Finalize report.

#### **VI. ESTIMATES OF FUNDING AND RESEARCH PERIOD**

*Period:* 12 months

*Funding:* \$49,000

#### **VII. URGENCY AND POTENTIAL PAYOFF**

Safety improvements are always an urgent priority with very high payoff. However, only finite funds are available. If traffic engineers and local governmental organizations have guidelines to recognize specific situations where larger, brighter, easier to read signs increase safety, funds can be earmarked more effectively. If, for example, larger signs are not determined to be more effective savings to counties and townships could be used more effectively elsewhere.

#### **VIII. IMPLEMENTATION STRATEGY**

The results will be disseminated in the form of guidelines by KDOT and the Kansas County Highway Association.

#### **IX. PROJECT PERSONNEL**

Drs. Rys and Russell have successfully conducted several studies of this type for KDOT, FHWA, and others including a major study that confirmed KDOT's sign sheeting policy was cost effective.

**X. SUBMISSION INFORMATION**

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