

Effectiveness of Entertaining, Non-Traffic-Related Messages on Dynamic Message Signs

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A scenario with a DMS in NADS-MiniSim

Introduction

Many transportation agencies throughout the United States use dynamic message signs (DMSs) to display traffic-related information such as travel times, lane closures, traffic updates, roadwork warnings, traffic crashes, and inclement weather information to motorists. Several state Departments of Transportation (DOTs) have recently implemented behavioral traffic safety messages to attract motorists' attention, raise awareness, and change driver behavior. These often-entertaining messages focus on seat belt use, distracted driving, and aggressive driving, as well as reinforce driving rules. Although these messages have gained public approval, no study has evaluated how effective these messages are in raising public awareness, changing behavior, and promoting safety.

Project Description

This research used a fixed-base driving simulator to determine the effects of DMSs on driver behavior. A DMS notifies drivers with safety, weather, incident, or traffic condition messages. Recently, however, state DOTs display safety messages with entertaining content. KDOT wanted to assess how these entertaining messages affect driving behavior. Therefore, this research evaluated the effect of DMS content on driver behavior using a combination of surveys and driver behavior data obtained from a fixed-base driving simulator.

Based on the literature, which included results of DMS modeling in driving simulators and DMS effects on driver behavior, a research methodology was developed. One hundred participants were recruited and screened using an online survey questionnaire that included messages currently displayed on DMS; feedback on their perceived effectiveness was requested. The second data collection was done via a driving simulator experiment. The simulator was prepared for the study, the DMS was set, and events were designed to capture changes in driver behavior and awareness. A total of 60 participants with diverse demographics drove by several DMSs that displayed a variety of messages. Participants completed a survey at the end of the experiment, and their responses were compared to responses of the online survey. Behavioral data (speeds, accelerations, gazes, etc.) were then reduced, and statistical analyses were performed, including hypothesis testing and analysis of variance, to evaluate to what extent the message content affected driver behavior. The study identified potential messages that were found to effectively affect driver behavior.

Project Results

The following conclusions were obtained from the analysis:

- Significant differences were found in the study between some of the collected variables. Participants drove at significantly lower average speeds after seeing the two speeding-related DMS messages (“Speeding Kills” and “Slow Down”) in all the events configured to capture this variable.
- The gap was significantly lower after showing the DMS message “Give Space, Don’t Tailgate,” proving that this message helped reduce tailgating.
- A significant increase in maintaining the move-over law was observed after the “Move Over for Law Enforcement” message was displayed.
- Not all anti-texting messages yielded significant changes in drivers’ texting behavior. Of the 10 displayed messages, only 5 effectively changed drivers’ texting behavior. Those messages were “Steering Wheel: Not A Hands-Free Device,” “Get Your Head out of Your Apps,” “One Text or Call Could Wreck It All,” “No Text Is Worth A Life,” and “What’s More Important, Your Text or Your Life?”
- Based on the survey results, 91% of the drivers stated that the “Move Over for Law Enforcement” was an effective message to show on a DMS.
- In addition, the following effective messages were identified: “Give Space, Don’t Tailgate,” “Speeding Kills—Arrive Alive,” and “No Text Is Worth A Life” (82%); “Click It or Ticket” (78.34%); “You Drink. You Drive. You Lose.” (74.44%); “Slow Down” and “Head Up Phone Down” (70%).

Project Information

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