HR-256 Perception & Interpretation of Advanced Warning Signs on County Roads

Key Words: Traffic control, Rural signing, Intersection safety, Advanced warning signs

ABSTRACT

This research consisted of five laboratory experiments designed to address two objectives in an integrated analysis. The two research objectives were:

1. To discriminate between the symbol Stop Ahead warning sign and a small set of other signs (which included the word-legend Stop Ahead sign).
2. To analyze sign detection, recognizability, and processing characteristics by drivers.

A set of 16 signs was used in each of three experiments. A tachistoscope was used to display each sign image to a respondent for a brief interval in a controlled viewing experiment. The first experiment was designed to test detection of a sign in the driver's visual field; the second experiment was designed to test the driver's ability to recognize a given sign in the visual field; the third experiment was designed to test the speed and accuracy of a driver's response to each sign as a command to perform a driving action. The 16 signs each contained two different legend forms for the messages "Stop," "Do Not Enter," "Stop Ahead," "Signal Ahead," "Merge Left," "Merge Right," "Keep Right," and "Keep Left." Word-legend messages were detected better than symbol-only messages. Recognition accuracy was higher for "Stop" message signs than for the other types of messages. The speed and accuracy of driver responses to sign messages in the driver decision experiment were highly variable and depended upon sign legend type, sign message, and the action required. However, it is particularly noteworthy that the word Stop Ahead and Signal Ahead signs produced more correct driver action decisions than did the symbol versions of these same signs.

A fourth experiment tested the meanings drivers associated with an eight-sign subset of the 16 signs used in the three experiments out-lined previously. Semantic scale data revealed that word legend signs produced more consistent meaning associations than did symbol signs. Each of the previous three experiments utilized a different set of drivers, but all 112 participants in the first three experiments were tested on semantic scales.

A fifth experiment required all persons to select which (if any) signs they considered to be appropriate for use on two scale model county road intersections. One intersection was a "T" intersection of two paved roads with a vegetative sight restriction in one corner. The other intersection was a gravel county road intersecting a paved primary highway. This scale intersection experiment was conducted in a static display format and did not provide the respondent any sense of vehicle speed. A slight preference was shown for word-legend signs over symbol-legend signs for those drivers using advance warning signs.

Drivers predominantly chose to place advance warning signs much closer to the intersection than the Manual on Uniform Traffic Control Devices suggests. However, several individuals did place advance warning signs at the MUTCD recommended location.

Social and behavioral variables, including length of driving experience, rural/urban experience, accident history, and other factors, were not found to exert any influence on the findings with the exception of differences based on the sex of the respondent. How-ever, under detailed multivariate analysis the difference due to sex disappeared, indicating that it was merely a result of small sample size.

The conclusions are that word-legend Stop Ahead signs are more effective driver communication devices than symbol stop-ahead signs; that it is helpful to drivers to have a word plate supplementing the symbol sign if a symbol sign is used; and that the guidance in the MUTCD on the placement of advance warning signs should not supplant engineering judgment in providing proper sign communication at an intersection.