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Human Factors Guidelines to Develop Educational Tip Cards for Aging Road Users

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Current Situation

Since standardization of traffic signals and signs across the U.S. began in the 1930s, research and experience have led to many changes, based on the effects, both intended and unintended, of traffic control devices. For example, in recent years, many left-turning drivers have seen the Flashing Yellow Arrow (FYA) for the first time. The FYA has the same meaning as a green signal indication governing a left turn lane. However, some drivers may misinterpret the green signal indication as a protected left turn, which can result in a very serious crash. The question arises whether an aging road user encountering a new traffic control device may have difficulty interpreting it. As new devices are installed and the driving population ages, education is needed, but what information is most helpful?

Research Objectives

Florida State University researchers examined the response of younger (21-35), middle aged (50-64), and older (65+) drivers to informational tip cards, considering many aspects of design and messaging.

Project Activities

The researchers, who are specialists in cognition and communications, identified relevant theories from which to develop a human factors checklist to guide the design of tip cards to benefit aging road users. A standard card and an enhanced card were developed for three devices: the FYA, Rectangular Rapid Flashing Beacon, and Right Turn on Red (ROR). Standard cards were those already in use by the Florida Department of Transportation, including a FYA tip card. Enhanced cards had the same information as standard cards, but were designed according to the researchers' human factors guidelines.

The researchers examined the cards' learnability, based on participant understanding of tip card information just after reading them. Enhanced tip cards conveyed information in less reading time than standard tip cards, with equal user satisfaction. After one week, the cards' long-term memorability was tested. Participants were asked to make rapid judgments upon viewing still images – both photographs and illustrations – of intersections that varied in regards to signal types and pedestrian presence. The researchers saw no difference in memorability between card types; overall performance was quite high even in the absence of tip card exposure. Photographic images led to better performance than illustrations.

The researchers also designed a video-based driving simulator exercise that included FYAs or ROR traffic control devices for middle-aged and older drivers. Drivers read two tip cards, one relevant and one irrelevant to the exercise, and then drove the simulated course. The researchers rated driver performance, and drivers rated the tip cards. The enhanced cards were effective for, and well-accepted by, both age groups. Study results led to an updated human factors checklist and tip card templates which can be downloaded at:

<http://www.FLsams.org/Roadway.htm#tipcards>.

Project Benefits

Improving the effectiveness of educational materials can improve driver understanding of traffic control devices and reduce the possibility of crashes for road users of all ages.

For more information, please see www.fdot.gov/research/.



Simulator view of an intersection with a flashing yellow arrow controlling the left turn lane.