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Express Lane Marker Color Human Factors Study on Concrete and Open-Graded Friction Course

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Current Situation

As an influx of new residents and businesses make Florida their forever home, the Florida Department of Transportation (FDOT) is focusing on making travel easier, quicker, and safer. In the past, Express Lane Markers (ELM), used to delineate the express lanes from regular lanes on expressways, were installed on concrete surfaces. Now, FDOT is moving toward Open Grade Friction Course (OGFC), an asphalt surface mix that is more appropriate for high volume/high-speed traffic.

The ELMs have been tested, installed, and approved for the former concrete surfaces, however, not for OFGC. A study into the best color for visibility and driver recognition and impact testing requirements for installation purposes is needed.



In this driving test, a highway with an express lane was simulated to gauge drivers' ability to identify lane markers.

Research Objectives

The objectives of this research project were to test the visibility and recognition of ELMs with different color patterns and to conduct a performance test of the ELMs on an OGFC surface. This project also developed recommendations and specifications for ELMs on OGFC surfaces.

Project Activities

The first task for the Florida International University research team was to develop a human factors study to determine the best color for express lane markers on concrete and asphalt OGFC surfaces. Through driving simulation and in-field testing along sections of Interstate 95, the team placed ELMs of various colors (white, black, and purple) on the express lanes in both high and low traffic conditions and in normal and foggy weather settings.

The simulations captured drivers' visibility distance, the distance from the delineators from which a driver can see them by tasking the drivers to indicate at which they could see the delineators. In the field, each vehicle was equipped with a data acquisition system (which contains GPS), which allowed drivers to mark where they detected delineators.

Using this feedback, the team conducted an analysis that defined the optimum color for ELMs.

For the test strip on the OGFC performance test, a team out of Texas Agriculture and Mechanical University's Transportation Institute conducted impact durability tests on both concrete and OGFC surfaces, including various types of ELMs, installation methods, and weather conditions.

The manual for uniform traffic control devices currently allows the use of orange, white, and yellow channelizing devices for an emphasis on pavement marking patterns.

Project Conclusions and Benefits

FDOT can use the results of this study to select the most appropriate delineator for use on its express lanes that have been paved with OGFC.

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