



Project Summary

Texas Department of Transportation

0-5890: Guidelines for the Use of Pavement Marking Symbols at Freeway Interchanges

Background

Pavement marking technology has advanced to allow the use of large multi-color symbols placed on pavement as a means of providing drivers with another source of information from which they can make good driving decisions. This project focused on the use of such in-lane pavement markings to provide the driver with lane guidance and warning information near freeway interchanges. More specifically, researchers evaluated the design and application issues that are associated with the use of pavement marking symbols.

What the Researchers Did

Researchers approached this project using several different types of evaluations to accomplish their objectives. The first approach was establishing the current state-of-the-practice with regard to the use of pavement marking symbols in Texas. The second approach for this project was conducting two sequential human factors laboratory studies that addressed public comprehension, recognition, and preference with regard to such symbols. Lastly, two different field studies were conducted. The first was a closed-course evaluation of the markings' visibility and the other was a real-world application of markings to identify operational effects.

What They Found

Based on the information gained through this project, researchers have developed basic recommendations for what information should be placed as in-lane pavement markings near an interchange. The following items list some of the key recommendations identified during this project.

- Shields should be used as opposed to text for highway identification. (See Figure 1.)
- The greatest benefit to motorists is gained through the use of both arrows and shields in the interchange area.
- Simple single-lane exits (particularly traditional right exits) need pavement marking symbols to be placed only in the exit lane.
- If in-lane pavement markings are used at complex interchanges (e.g., optional lanes, multi-lane exits, etc.), they should be applied to all lanes.
- Optional lane symbol pavement markings should provide the same basic information as other lanes at that interchange (i.e., show both highway shields and an optional arrow).

Research Performed by:

Texas Transportation Institute (TTI),
The Texas A&M University System

Research Supervisor:

Brooke R. Ullman, TTI

Researchers:

Susan Chrysler, TTI
Melisa D. Finley, TTI
Nada D. Trout, TTI

Project Completed: 8-31-09

- Order of information in the optional lane should be:
 - arrows preceding the highway route shields,
 - primary (through traffic) highway shield, then
 - exiting route shield last.
- The length of pavement marking symbols recommended for standard freeway interchanges are:
 - shields 15 ft, and
 - arrows 12 ft.
- Markings should be placed after the motorist has passed at least one overhead guide sign for the interchange.
- The pavement marking symbols should be placed far enough upstream of the decision point to allow a motorist to safely change lanes based on the information provided.

What This Means

Based on the results of this project, researchers believe that there is a benefit to the use of pavement marking symbols at freeway interchanges. These benefits translate to both freeway operations and motorist understanding. Based on this belief, researchers have developed guidelines for the use of pavement marking symbols in this area.

These guidelines should be considered prior to the application of such markings to ensure that motorists are receiving the best possible benefit from this information. Not only do these guidelines provide basic information concerning the appropriate application of pavement marking symbols at an interchange, but they also include examples in many cases to help illustrate the point.



Figure 1. Example of In-Lane Pavement Marking Shields.

For More Information:

Research Engineer - Wade Odell, TxDOT, 512-465-7403
 Project Director - Omar Madrid, TxDOT, 915-790-4331
 Research Supervisor - Brooke R. Ullman, TTI, 979-862-6636

Technical reports when published are available at:
<http://library.ctr.utexas.edu/index.html>

www.txdot.gov
 keyword: research



This research was performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation, nor is it intended for construction, bidding, or permit purposes. Trade names were used solely for information and not for product endorsement.