Project Summary

Texas Department of Transportation

0-4701: Traffic Control Device Evaluation and Development Program

Background

Traffic control devices provide one of the primary means of communicating vital information to road users. Traffic control devices notify road users of regulations and provide warning and guidance needed for the safe, uniform, and efficient operation of all elements of the traffic stream.

Because of certain aspects of traffic control devices, the Texas Department of Transportation (TxDOT) undertook this project to address the shorter-term, lower-cost research needs of traffic control devices. Unlike many other elements of the surface transportation system (such as construction activities, structures, geometric alignment, and pavement structures), traffic control devices have a relatively short service life (typically anywhere from 2 to 12 years). The capital cost of traffic control devices—and the cost of research on them—is usually less than the cost of these other elements. Traditional research projects can take two or more years before implementation; traffic control devices benefit from a shorter research-to-implementation cycle.

What the Researchers Did

This project conducted 17 research activities related to traffic control devices during the five-year study period. These activities fell into three general categories: field evaluations of traffic control devices, development of traffic control device guidelines, and preliminary or theoretical assessments of traffic control device issues.

What They Found

Eight of the research activities involved field evaluation of the effectiveness of traffic control devices and produced the following findings:

- A driver survey on dual logos for specific services signs, i.e., two logos in the same panel, did not indicate a need to prohibit dual logos.
- Flashing beacons mounted on the back of School Speed Limit assemblies, facing drivers that are still within the school zone, can help remind drivers of the reduced speed limit.
- A red border added to a Speed Limit sign can help improve conspicuity of the sign and increase driver awareness of the lowered speed limit.
- Tests of a proposed temporary sign support structure for work zone signs indicated that the support design needed changes. Once these changes were made, the structure passed the crash test and received Federal Highway Administration (FHWA) approval.

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- An extinguishable left-turn yield sign for signalized intersections ("LEFT TURN YIELD" during the permissive portion of the phase; dark during the red, yellow, and protected portions of the phase) could reduce left-turn crashes at intersections.
- The retroreflectivity of an experimental lead-free thermoplastic pavement marking was comparable to that of the standard TxDOT leaded material.
- Mobile retroreflectometers performed as well as traditional handheld devices in measuring the performance of pavement marking retroreflectivity.
- In a limited field test, retroreflective sheeting placed on the backplates of traffic control signals did not improve the visibility of signal heads.

Researchers worked on four sets of traffic control device guidelines for TxDOT:

- updated content of the *Sign Crew Field Book* with an updated format for posting on the TxDOT website as an online manual,
- updated edition of *Traffic Signal Warrants: Guidelines for Conducting a Traffic Signal Warrant Analysis* to reflect the warrants in the 2006 *Manual on Uniform Traffic Control Devices*,
- new guidelines in the *Work Zone Implementation Handbook* to assist TxDOT personnel with implementation of FHWA's final rule on work zone safety and mobility, and
- new TxDOT guidelines for pedestrian accessibility at signalized intersections (formatted as a chapter that can be added to the appropriate TxDOT manual).

Another benefit of this research project was the ability to assess issues on a theoretical or limited basis. These assessments often represented a preliminary type of investigation that identified the need to conduct more detailed analysis. Researchers conducted five assessment activities in this project:

- developed an automated process for monitoring dew formation on traffic signs,
- developed an automated process for identifying the starting and ending points of no passing zones based on vertical roadway alignment,
- developed guidelines for implementing pedestrian countdown signals at existing signalized intersections,
- calculated the letter height for freeway guide signs and the marking widths for pavement markings that would be necessary on 80-mph highways to provide a performance level consistent with that of current freeways, and
- conducted a theoretical examination of driver behavior when leaving a lane to determine the optimal lateral placement of a shoulder rumble strip.

What This Means

Working with TxDOT staff, TTI researchers accomplished multiple outcomes on numerous traffic control devices during this five-year project. Researchers conducted 17 separate activities, from which some recommendations have already been implemented, and proved the value of a broad traffic control device project that has the ability to address a wide range of issues on a timely basis. Although the current project terminated in August 2008, TxDOT is continuing a similar activity with project 0-6384, "Evaluation and Development of Traffic Control Devices."

For More Information:

0-4701-1 Evaluation of Traffic Control Devices: First Year Activities
0-4701-2 Evaluation of Traffic Control Devices: Second Year Activities
0-4701-3 Evaluation of Traffic Control Devices: Third Year Activities
0-4701-4 Evaluation of Traffic Control Devices: Fourth Year Activities
0-4701-5 Evaluation of Traffic Control Devices: Fifth-Year Activities

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