



Project Summary Report 1794-5
Project O-1794: Driver Education Program for Traffic Control Devices
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Driver Education Needs and Materials Concerning Traffic Control Devices

Traffic signs, signals, and pavement markings communicate critical information to drivers. Recent research studies have identified traffic control devices that are misunderstood by drivers, and the studies indicate that teenage and older drivers have the most difficulty in understanding selected traffic control devices. The studies recommended increased educational efforts, particularly in teenage driver education. There are limited educational materials focusing on improving driver education with respect to traffic control

devices, and very few studies have specifically addressed teenage driver comprehension issues.

Texas Department of Transportation (TxDOT) Project O-1794 was initiated to identify teenage and older driver and safety instructor needs and to develop targeted educational products and programs. Researchers' first and second year activities focused on identifying problems associated with teenage driver comprehension of traffic control devices, identifying critical behavior issues for teenage and

older drivers, and serving as part of a technical working group focusing on improving the driver education curriculum in Texas. Third year activities focused further on understanding older driver comprehension of traffic control devices, determining the needs of TxDOT Traffic Safety Specialists, and developing educational products based upon the project findings.

What We Did . . .

During Phase I, researchers identified perceptions and problems associated with traffic control devices through surveys of driver education instructors, law enforcement personnel, and teenage drivers. The researchers used the results of these evaluations to develop recommendations for improving teenage driver understanding of traffic control devices. Researchers also developed recommended descriptions of devices for inclusion in the driver education curriculum. During Phase II of the project, researchers identified critical driver behavior issues for teenage and older drivers



Figure 1. A newly licensed teenage driver



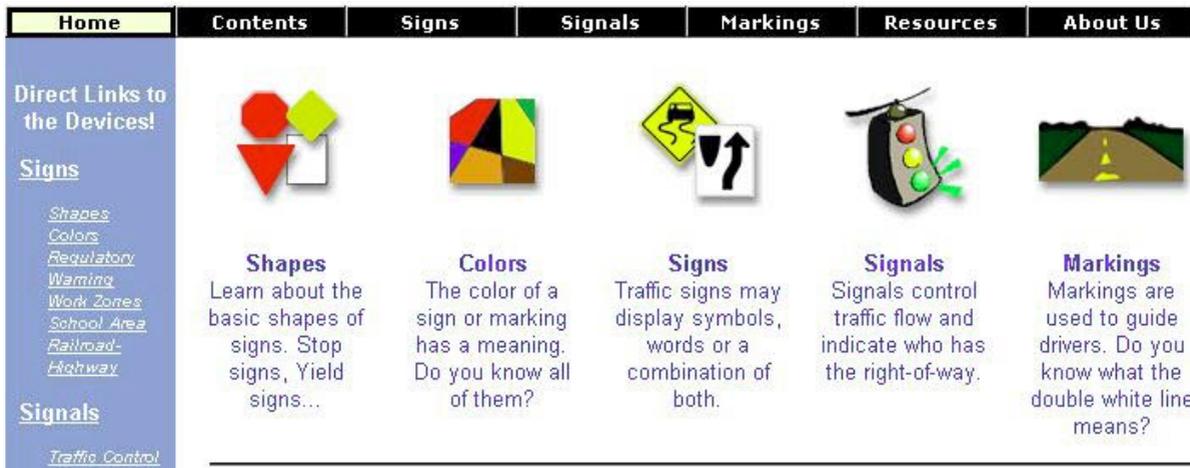


Figure 2. A portion of the proposed Traffic Control Devices Web Site home page

through additional surveys. The recommendations from Phases I and II were used to suggest additions and changes to the Texas Education Agency (TEA) curriculum for teenage drivers. The Texas Transportation Institute also reviewed the modules in the curriculum related to traffic control devices and traffic engineering issues and recommended changes and additions to the Texas Drivers Handbook chapter on signals, signs, and markings.

During Phase III, researchers conducted a one-on-one survey with older drivers to further identify older driver behavior issues and perceptions of traffic control devices. Telephone interviews were also conducted with TxDOT traffic safety specialists. The interviews were used to determine the types of materials and information that would be most helpful to them. The findings from Phases I, II, and III were combined to develop educational products including an Internet web page to be accessed through TxDOT's web site and a spiral-bound notebook to be distributed to teenage drivers.

What We Found . . .

The driver education instructor survey identified instructors' perceptions of teenage driver comprehension difficulties with traffic control devices. Instructors listed the following five devices as most misunderstood by teenage drivers: left-turn displays, traffic signals, two-way left-turn lanes, freeway lane control signals, and pavement markings.

The law enforcement survey revealed that officers believe the most misunderstood devices are the Center Lane Left-Turn Only sign, Yield sign, and traffic signals. Suggested areas for improvement in driver education and training include: more training with emphasis on traffic control devices, construction areas, laws, courtesy, and accidents; more in-vehicle driving time; more defensive driving classes; and more awareness of the dangers of driving. A large percentage of respondents indicated that retraining or recertification is a good idea; the most suggested frequencies for retraining or recertification were 4, 5, and 10 years.

The goal of the teenage driver survey was to obtain information to assess the understanding of traffic control devices by drivers between the ages of 15 and 17. The traffic control devices evaluated in the teenage driver survey were limited to the devices that had the greatest potential for misunderstanding. Traffic control devices that proved most difficult to teenage drivers were flashing beacons, left-turn signal displays, and symbol signs. Additional teenage driver surveys indicated that teenage drivers are aware that speeding and driving inexperience are the major causes of teenage traffic crashes. Teenage drivers indicated they have difficulty understanding pavement markings and construction zones; this area of misunderstanding was also identified in the first year of this research.

For older drivers, the operations noted as most difficult included driving at night, backing up, and passing on two-lane highways. Older drivers also indicated that they found the following driving tasks most difficult: seeing and



reading signs (including understanding basic shapes), seeing in work or construction zones, understanding what to do in a work or construction zone, seeing pavement markings, and maintaining a comfortable space between their vehicles and the vehicles around them. Larger signs, larger letters on signs, and more street lighting were rated highest as items that would make driving easier.

The Researchers Recommend . . .

Based on the project findings, researchers developed two products emphasizing a clearer understanding of traffic control devices. Web pages emphasizing traffic control devices are designed to become a part of TxDOT's new traffic safety web site (see Figure 2). The web pages include information on signs, signals, markings, educational resources, and links to related sites. Information can be added or updated to keep it current.

Researchers also developed a spiral notebook emphasizing the meanings of traffic control devices. The notebook targets teenage drivers and emphasizes the same traffic control devices with colorful layouts (see Figure 3). Both of these products include information on:

- sign shapes (octagon, horizontal rectangle, equilateral triangle, pennant, diamond, vertical rectangle, pentagon, round)
- sign colors (red, green, blue, yellow, black, white, orange, brown, fluorescent yellow-green)
- regulatory signs (Stop, Stop with Cross Street Traffic Does Not Stop, Yield, Keep Right, Speed

- Limit, Center Lane Two-Way Left-Turn Only, Do Not Cross Double White Line)
- warning signs (Turn, Curve, Lane Reduction, Added Lane, Divided Highway Begins, Divided Highway Ends, No Passing Zone, Slow Down on Wet Road, Pedestrian Crossing Ahead, Pedestrian Crossing, Truck Crossing, Advisory Speed Plates, Low Shoulder, Ramp Metered When Flashing, Flagger Ahead Construction Warning Sign)
- school area signs (School Advance, School Crossing, School Speed Limit)
- railroad-highway grade crossing signs (Railroad Crossing,

Advance Warning Sign)

- traffic control signals (various signal and left-turn displays, flashing beacons, and lane-use control signals) and
- pavement markings (broken yellow lines, solid and double yellow lines, solid yellow lines, single and double white lines).

The researchers recommend using the web pages and notebook to enhance the modules developed for the Texas Education Agency's updated driver education curriculum for teenage drivers. Additionally, the web site will be linked to related sites, making it accessible to other drivers.

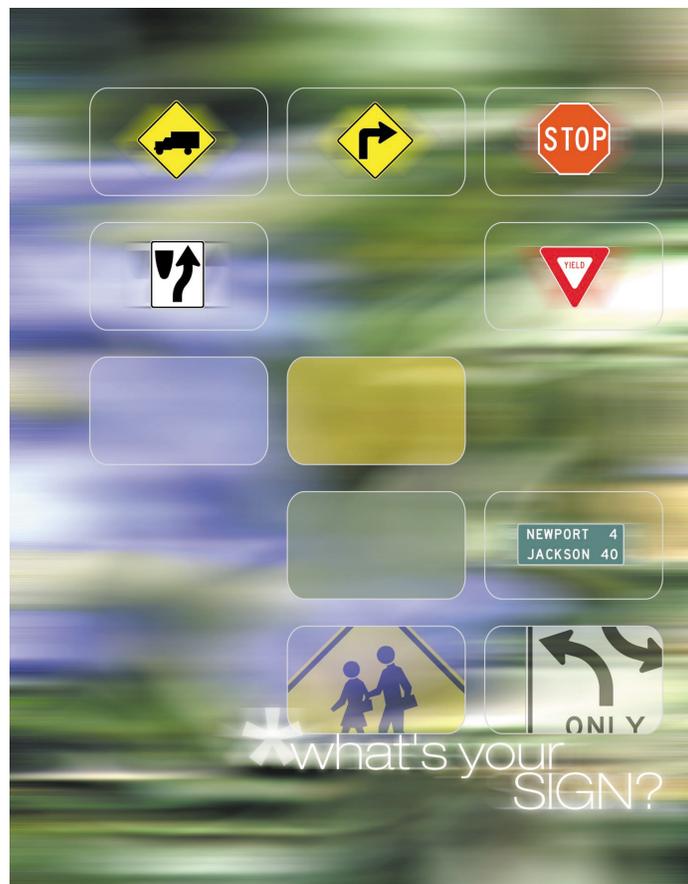


Figure 3. Cover of traffic control devices notebook



For More Details . . .

Related reports:

Report 1794-1, *Recommendations to Improve Driver Education on Traffic Control Devices*

Report 1794-2, *Driver Behavior Characteristics of Teenage Drivers and Older Drivers*

Report 1794-3, *Updating Educational Materials on Traffic Control Devices*

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To obtain copies of these reports, contact Dolores Hott, Texas Transportation Institute, Information & Technology Exchange Center, (979) 845-4853, or e-mail d-hott@tamu.edu. See our on-line catalog at <http://tti.tamu.edu>.

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The revised Texas Drivers Handbook chapter on signals, signs, and pavement markings has been submitted to DPS for review and may be included in the next version.

The “notebook” which targets teenage drivers has been published.

The web pages emphasizing traffic control devices are under review and may become a part of TxDOT’s new traffic safety web site.

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