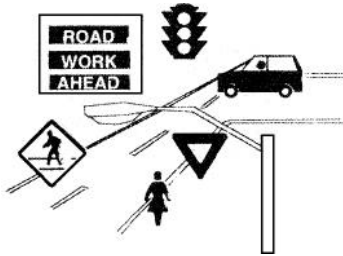


Summary Report

FHWA Traffic Safety Research Program



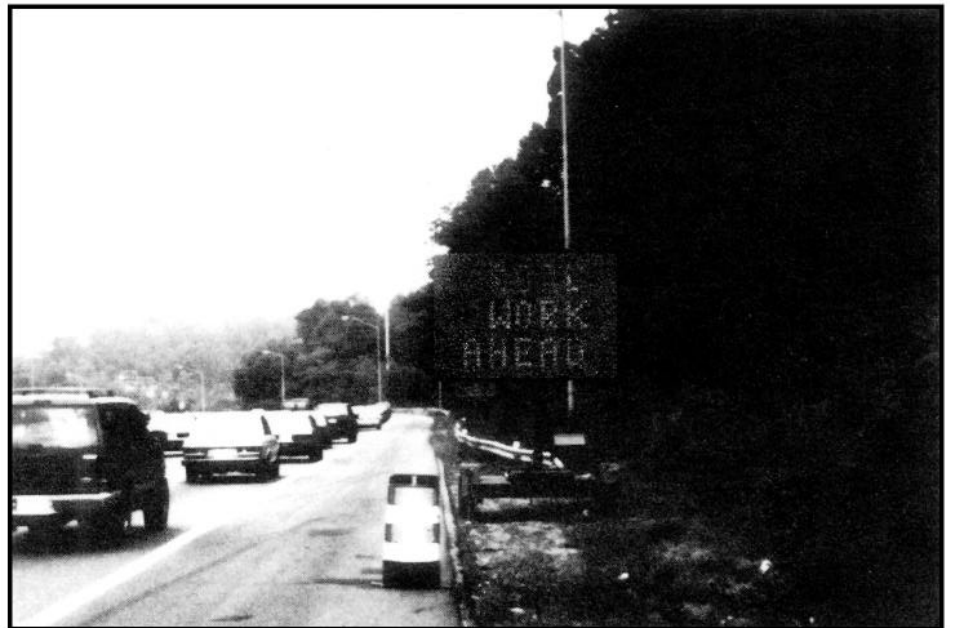
The FHWA Traffic Safety Research Program addresses the visibility of the roadway and its environment, and traffic control methods and devices to promote the safe and efficient movement of vehicles and pedestrians. The current emphasis areas are: the ITS program on advanced traveler information systems (ATIS), condition-responsive traffic control devices, and improved driver visibility through fluorescent materials and ultraviolet headlighting. Recent research includes recommending guidelines for the retroreflective requirements for traffic signs and pavement markings. The research is to support the programs of the FHWA's Office of Highway Safety and the Manual on Uniform Traffic Control Devices.



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Federal Highway Administration

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UNIFORM TRAFFIC CONTROL AND WARNING MESSAGES FOR PORTABLE CHANGEABLE MESSAGE SIGNS



A portable changeable message sign.

Uniform Traffic Control and Warning Messages for Portable Changeable Message Signs

The *Manual on Uniform Traffic Control Devices* indicates that "Portable Changeable Message Signs (PCMS) are traffic control devices with the flexibility to display a variety of messages to fit the needs of road and street authorities." The purpose of this study was to develop and test word and symbol traffic control and hazard warning messages for use on PCMS's. The messages were designed for the standard PCMS with three lines of eight characters each. The character is composed of 35 dots (7 high by 5 wide). For symbols, a sign with a matrix of dots 40 high by 96 wide was used. The testing was also limited to single-sign, non-sequential messages.

Research Approach

The literature was reviewed, State highway engineers were interviewed, PCMS manufacturers were surveyed, and motorists were questioned to develop an extensive list of candidate PCMS messages for subsequent evaluation during the laboratory and field testing. More than 800 messages were identified for 30 situations. Many of the messages were very similar, using only a different word or phrase.

The laboratory studies were conducted to identify those key words or phrases that the motorist felt were most effective. Field tests, both daytime and nighttime, were conducted for candidate messages that lacked a clear winner during the laboratory studies. Also, six symbol messages were shown during the field tests to evaluate motorist comprehension of these messages. These symbols were for congestion, flagger ahead, lane-shift arrows, lane-reduction transition, two-way traffic arrows, and accident symbol.

1.	FOG	CAUTION FOG	CAUTION FOG AHEAD	17.	ROAD CLOSED	ROAD CLOSED AHEAD
2.	ICY ROAD	CAUTION ROAD	ICY AHEAD	18.	LANES CHANGE	LANES CHANGE AHEAD
3.	SNOW	BLOWING SNOW		19.	FOLLOW PACE CAR	
4.	CHAINS REQUIRED		CHAINS REQUIRED AHEAD	20.	KEEP LEFT	KEEP LEFT AHEAD Symbol (W4-2) for lane reduction.
5.	SLIPPERY ROAD		CAUTION SLIPPERY ROAD	21.	DO NOT PASS.	
6.	ROAD FLOODED		CAUTION ROAD FLOODED	22.	SPEED LIMIT XX MPH	
7.	SLOW MOVING TRAFFIC			23.	MINIMUM SPEED XX MPH	
8.	HEAVY TRAFFIC		HEAVY TRAFFIC AHEAD	24.	TRAFFIC SIGNAL OUT	
9.	DUST STORM			25.	TRUCK CROSSING	WATCH FOR TRUCKS
10.	HIGH WINDS		CAUTION HIGH WINDS	26.	ALL LANES OPEN	
11.	DANGER FALLING ROCKS			27.	EMERGENCY VEHICLES	
12.	STEEL PLATES			28.	LOAD SPILL	
13.	MEN WORKING			29.	FOLLOW DETOURS	FOLLOW DETOURS AHEAD
14.	FLAGMAN AHEAD			30.	TRAFFIC ADVISORY XXX AM	
15.	LANE MARKING		PAINT CREW			
16.	BRIDGE CLOSED		BRIDGE CLOSED AHEAD			

Research Results

At the left are the standard messages recommended for the 30 situations. The field tests on symbols on PCMS's showed some motorists do not understand their meanings, except for the lane-reduction symbol. Educational efforts would be needed before they are used.

For More Information

A full report on this study is available from the FHWA R&D Report Center, phone no. 703 285-2144.
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 This research was conducted by the Center for Applied Research. For more information, contact Howard Bissell of FHWA, HSR-30, 703 285-2428.