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. The messages were designed for the standard PCM 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, PCM manufacturers were surveyed, and motorists were questioned to develop an extensive list of candidate PCM 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 AHEAD

2. **ICY ROAD** CAUTION
   ICY AHEAD

3. **SNOW** BLOWING
   SNOW

4. **CHAINS REQUIRED**
   CHAINS REQUIRED AHEAD

5. **SLIPPERY ROAD**
   CAUTION SLIPPERY ROAD

6. **ROAD FLOODED**
   CAUTION ROAD FLOODED

7. **SLOW MOVING TRAFFIC**

8. **HEAVY TRAFFIC**
   HEAVY TRAFFIC AHEAD

9. **DUST STORM**

10. **HIGH WINDS**
    CAUTION HIGH WINDS

11. **DANGER FALLING ROCKS**

12. **STEEL PLATES**

13. **MEN WORKING**

14. **FLAGMAN AHEAD**

15. **LANE MARKING**
    PAINT CREW

16. **BRIDGE CLOSED**
    BRIDGE CLOSED AHEAD

17. **ROAD CLOSED**
    ROAD CLOSED AHEAD

18. **LANES CHANGE**
    LANES CHANGE AHEAD

19. **FOLLOW PACE CAR**

20. **KEEP LEFT**
    KEEP LEFT AHEAD
    Symbol (W4-2) for lane reduction.

21. **DO NOT PASS.**

22. **SPEED LIMIT**
    XX MPH

23. **MINIMUM SPEED**
    XX MPH

24. **TRAFFIC SIGNAL OUT**

25. **TRUCK CROSSING**
    WATCH FOR TRUCKS

26. **ALL LANES OPEN**

27. **EMERGENCY VEHICLES**

28. **LOAD SPILL**

29. **FOLLOW DETOURS**
    FOLLOW DETOURS AHEAD

30. **TRAFFIC ADVISORY**
    XXX AM

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**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.