



**The Ohio Department of Transportation
Office of Research & Development
Executive Summary Report**

Field Evaluation of Unlighted Overhead Guide Signs Using Older Drivers

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Problem

In the preceding Unlighted Overhead Guide Sign Feasibility Study, it was determined that the lighting of overhead guide signs on freeways could be eliminated if white microprismatic Type VII or Type IX legends were used on green beaded Type III backgrounds. Because the expert panel in that study was limited to ODOT engineers who were relatively young (average age 38), it was considered necessary to conduct a second study to ensure that these unlighted overhead guide signs would meet the needs of older drivers, who have typically degraded visual capabilities. Additionally, there was interest in evaluating Type VIII and microprismatic Type III sheeting materials, which were not included in the first study.

Objectives

This study aims to measure the suitability of unlighted overhead guide signs in certain material combinations for older drivers. The material combinations studied were (legend on background, unlighted except where noted) beaded Type III on beaded Type III, lighted beaded Type III on beaded Type III, Type VIII on microprismatic Type III, Type IX on beaded Type III, Type IX on Type IX, and Type VII on beaded Type III. The lighted beaded Type III on beaded Type III sign represented existing sign lighting practice in Ohio.

Description

The experimental signs were erected on US Route 30 in Mansfield along a 28-mile loop. Twenty older drivers, ages 63-81 (average 72.1) were recruited as evaluators. Their corrected visual acuity ranged from 20/20 to 20/29 with an average of 20/25.

Evaluators were driven in pairs in the passenger and middle seats of a 2002 Dodge Caravan.

Headlights were kept on low beams as the van passed under a group of three test signs. After passing each sign group, the evaluators completed evaluation forms in a nearby parking area. The forms asked questions about the visibility, readability, and appearance of the signs. Additionally, after two loops were completed, one approaching signs in the left lane and one in the right lane, an exit interview form was completed. The exit interview asked respondents which sign groups they felt were adequate for nighttime use from a standpoint of visibility, readability, and overall appearance.

Conclusions & Recommendations

With older drivers, it appears that the preferred options are Type IX on Type IX or Type VII on beaded Type III. This is a change from our previous recommendation of Type IX on beaded Type III as one of the top two material combination options. It appears that the higher background luminance of the Type IX background material is preferred by older drivers, perhaps because it increases the amount of overall light reflected from the sign at closer distances, even at some cost in contrast. Type IX materials are designed for better performance at closer distances of less than 400 feet (122 m). 80% of evaluators thought Type IX on Type IX signs were adequate for nighttime use from a visibility and readability standpoint on the exit interview form. On the other hand, the Type VII legend may be preferred because it is designed to appear brighter at a longer distance. This may enhance the perceived legibility of the legend, which was highest for this sign group as measured by responses on the Sign Evaluation Form. 65% of the evaluators selected Type VII on beaded Type III as adequate for nighttime use from a visibility and readability standpoint.

Both of these unlighted sign groups, Type IX on Type IX and Type VII on beaded Type III, were rated noticeably higher than the lighted beaded Type III on beaded Type III sign group. In fact, the lighted sign group ranked fourth or fifth in terms of visibility and readability, and only 40% (visibility) or 45% (readability) selected the sign group as adequate in the exit interview. This suggests that implementing unlighted signs with appropriate materials may actually constitute a perceived improvement on Ohio's highways.

The Type VIII on microprismatic Type III sign group performed about as well as the lighted sign group. The Type IX on beaded Type III group performed markedly worse than in the previous study, being fairly consistently the second lowest sign, above the unlighted beaded Type III on beaded Type III, which, as expected, was the worst performer.

Implementation Potential

As in the previous study, we recommend to ODOT to prepare a statewide implementation plan and schedule to discontinue the practice of providing and maintaining luminaires for overhead signs after replacing step by step all overhead signs in the State with microprismatic Type VII sheeting legends on beaded Type III background sheeting. Type IX on Type IX may be specified as an alternative combination, particularly for signs with relatively short approach distances of less than about 400 feet (122 m).

The change of practice from lighted to unlighted overhead signs with white microprismatic Type VII legends on green beaded Type III backgrounds, or Type IX legends on Type IX backgrounds, will have a number of benefits including the elimination of the luminaire installation costs, the electricity requirements at overhead signs, the electricity costs, the maintenance and associated traffic control costs, and the wasted illumination towards the night sky ("light pollution").