

# **EVALUATION OF GUIDE SIGN FONTS**

## **Task 2: TOPIC INVESTIGATION**

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### INTRODUCTION

In the last 50 years, the reflectivity of sheeting materials used for highway guide signs has improved dramatically in color and brightness; however, the basic design and fonts used on these signs have remained relatively unchanged. Of particular concern, the prismatic high-intensity retroreflective sheeting materials that are currently being used produce a halation effect (or overglow) when lights hit them. The letter edge blurring caused by the halation effects is especially a problem for older drivers and others with reduced contrast sensitivity, and this has brought into question the resulting legibility of existing fonts on roadway signs.

Series E Modified, also known as Highway Gothic has long been the standard font for positive contrast highway guide signs. However, in the 1990s a new highway sign font, ClearviewHwy®, hereafter referred to as Clearview, was developed and tested and is now in use as well. In 2004, FHWA issued an Interim Approval for the optional use of Clearview font for positive contrast legends on guide signs. The newly released 2009 FHWA MUTCD did not include Clearview but left the Interim Approval in force because more definitive research is needed.

### BACKGROUND OF CLEARVIEW FONT

Clearview was developed for traffic signs by a design team that included Donald Meeker and Christopher O'Hara of Meeker and Associates, Inc; James Montalbano of Terminal Design, Inc; and Martin Pietrucha, PhD, and Philip Garvey of the Pennsylvania Transportation Institute, with supporting research by Gene Hawkins, PhD, and Paul Carlson, PhD, of the Texas A&M Transportation Institute (TTI), and advice on research design by Susan Chrysler, PhD, Director of Research at the National Advanced Driving Simulator, University of Iowa.

Penn State University conducted the first nighttime research on Clearview in the 1990s demonstrating its efficacy. Researchers focused specifically on fonts used for destination legends on freeway guide signs, looking at ways to create a font that would provide greater legibility than Series E(Mod) [1]. The study also looked at comparing the ease of recognition of mixed-case legends (eg, upper- and lower-case letters) versus those with all uppercase letters (Series D) and also comparing the required size for the letters and resulting sign based on the lettering used. Results showed that similar to printed text, accuracy, viewing distance, and reaction time were all better for the mixed-case lettering.

Prior studies have also shown that the Clearview font provides increased legibility for positive contrast overhead and ground-mounted guide signs when compared to existing fonts [1-6]. As mentioned previously, researchers at the Pennsylvania Transportation Institute performed the first Clearview study [1]. Since then, several studies sponsored by the Texas Department of Transportation (TxDOT) have been completed at the Texas A&M Transportation Institute [2-6]. The research has focused mainly on positive contrast signs (mostly white legend on green background), although the 2006 study evaluated the effectiveness of Clearview font on negative contrast signs of various colors [6].

The visual structure of Clearview differs from Highway Gothic in two primary ways: Clearview lowercase letters are taller and the interior shapes of the letters are more open; the letter spacing for the lowercase Clearview is much more open than the 2000 Highway Gothic. Clearview is available in six weights, with each weight based on use for positive contrast signs (eg, white letters on a darker background) or negative contrast signs (eg, black letters on a lighter background). These fonts are shown in Figure 1.



Figure 1. Clearview positive and negative contrast fonts [7].

The version of Clearview font designed to substitute for Series E(Mod) is Clearview 5W, which was found to be more legible than Series E(Mod) but with a longer footprint (ie, requiring more sign space). To address this issue, the developers of Clearview created a modified version, Clearview 5WR. (See Figure 2) Subsequent research completed at TTI found that Clearview 5WR provided, on average, the same footprint as Series E(Mod) but with significantly longer legibility distances [4]. Of note, although Clearview 5W and 5WR have received the most research attention, the entire family of positive contrast Clearview fonts has been granted interim approval by FHWA.

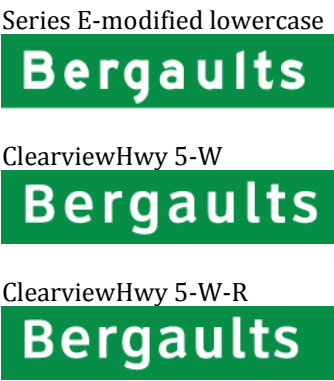


Figure 2. Comparison of Series E(Mod), Clearview 5W, and Clearview 5WR fonts [8].

## THE NEED FOR FURTHER RESEARCH

As stated above, studies have shown that Clearview 5WR provides longer legibility distances than Series E(Mod). However, these studies involved changing both stroke width and letter spacing of the Clearview font to identify the ideal characteristics for providing the greatest legibility distance, while the Series E(Mod) font remained unchanged. It is not known how the two fonts compare when similar modifications are made to Series E(Mod), including varying stroke width and letter spacing. Thus the focus of this study is to determine if a font developed from the current Series E(Mod) font, such as SignCAD E(Mod), will provide an overall performance, legibility, and footprint similar to Clearview 5WR for positive contrast overhead guide signs.

Although final testing of any fonts will be done with actual full-size guide signs on the roadway, preliminary laboratory testing may also prove helpful. Studies incorporating the “blur tolerance technique” or the “recursive blur technique” have been used to test legibility distance in the laboratory. This technique presents individual experimental signs in a blurred state and sequentially “deblurs” the signs until the observer can identify critical details being presented. Results indicate that legibility distance can be predicted from blur recognition threshold data [9-11]. Because the blur tolerance tests somewhat mimic the halation effect of the high-intensity sheeting on roadway signs, this technique may prove effective in determining if other readily available fonts with footprints similar to Clearview 5WR and Series E(Mod) (eg, SignCAD E(Mod), Arial, Tahoma, etc) may provide similar legibility and performance characteristics.

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