



Project Summary Report 0-4984-S  
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Project 0-4984: Evaluation of Clearview Font  
on Negative Contrast Signs

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## Clearview Font on Negative Contrast Traffic Signs: Summary Report

The Clearview font was developed for traffic signs as the result of a program to increase the legibility and ease of recognition of positive contrast sign legends while reducing the effects of halation (or overglow). Halation is a particular problem for older drivers and drivers with contrast sensitivity when letters use high brightness retroreflective materials.

One component of the program was to identify ways to create a more effective typeface than the E-modified font used for destination

legends on freeway guide signs. A second component was to compare the ease of recognition of mixed-case displays in lieu of all capital letter displays (Series D), and to learn if a mixed-case display would need to be larger than the comparable all-capital display for improved legibility and ease of recognition. When allowing a viewer to read the footprint of the word displayed in upper- and lowercase letters similar to printed text, there is an increase in accuracy, viewing distance, and reaction time.

The new Clearview font is provided in five weights. Each weight is specified with two versions: one for use in positive contrast applications (light letter on a dark background) and one for use in negative contrast applications (dark letter on a light background). The negative contrast version is optically adjusted to appear the same weight as the positive contrast version, but actually has a slightly heavier stroke width than the positive contrast version (see Figure 1). The negative contrast version

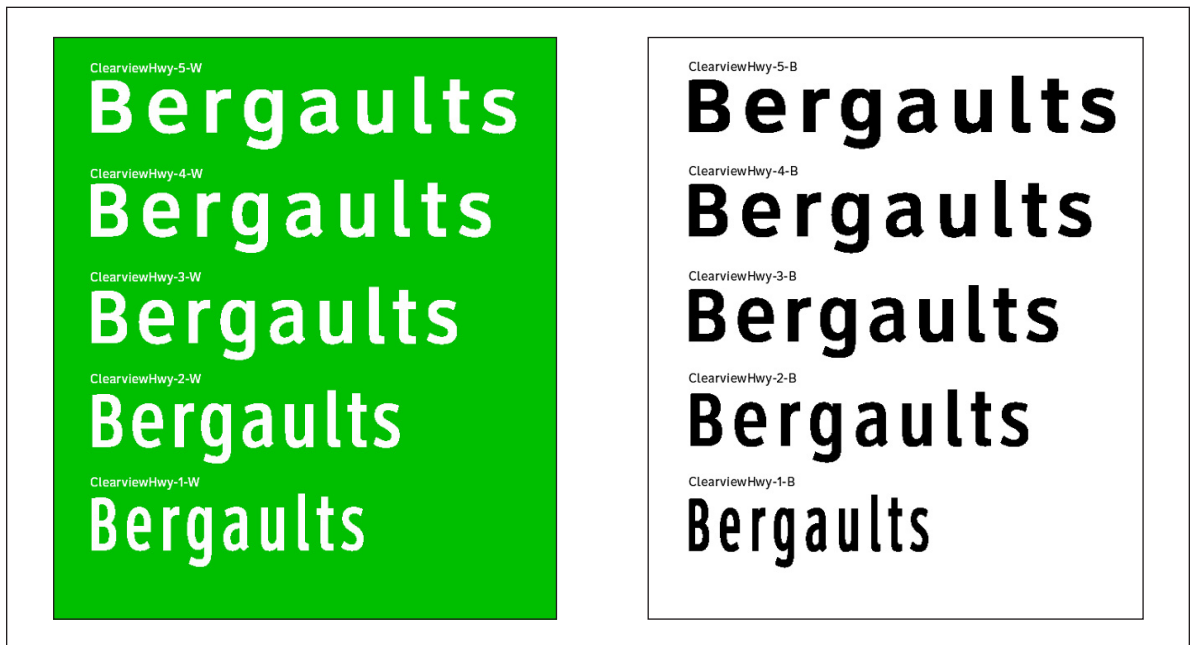


Figure 1. Clearview Positive and Negative Contrast Fonts.



was developed by Meeker and Associates following the same design principles used for the positive contrast version. The negative contrast version, however, had not ever been subjected to legibility testing prior to the current project.

### What We Did...

Before the research team performed any analyses of the negative contrast version of Clearview, the negative contrast signs currently contained in the *Texas Standard Highway Signs Design Manual* were analyzed to determine how to systematically replace the current font with Clearview. For instance, measurements were made to determine the distance between the sign border and the legend and the interline spacing. An example of some of these measurements is shown in Figure 2.

Based on these measurements, the research team identified a series of seven modifications that could be applied to the signs when replacing the current font with the negative contrast version of Clearview. Three of these modifications were selected for further evaluation—meaning that three alternative fonts (all a variety of Clearview) were tested against the FHWA font used on negative contrast signs.

In the first of two follow-up evaluations, the researchers used a laptop computer presentation to test seven frequently used negative contrast signs. The signs were shown in an uppercase-only font (Standard Highway Series) and a mixed-case font (Clearview) for a total of 14 signs. All signs were shown in a photograph in an appropriate roadway context (Figure 3). The standard highway series font was replaced with the Clearview font without changing

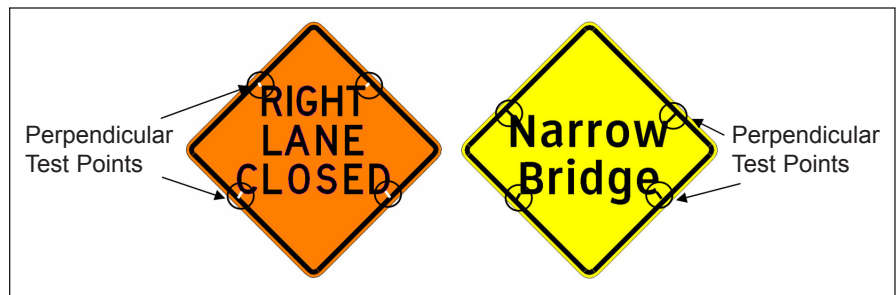


Figure 2. Perpendicular Test Points.



Figure 3. Presentation Images Displaying Each Sign Font.

the letter height, line spacing, or letter spacing. Subjects were shown each image and asked to identify the legend on the sign. The signs were displayed for one second.

In the second evaluation, the researchers conducted daytime and nighttime legibility and recognition experiments to assess the performance of the Clearview

font designed for negative contrast ground-mount signs (Figure 4). Fluorescent yellow, fluorescent orange, and white signs were included. The warning signs were all 36-inch diamond signs, and the white signs were rectangular signs measuring 36 inches wide and 30 inches high. The signs were mounted at a height of 7 feet to





Figure 4. Legibility Task Course and Signs in Daytime.

the bottom of the sign and offset approximately 18 feet from the driving lane. The signs used in the evaluation displayed two-line and three-line legends.

Research participants drove the test vehicle along a closed road course. In the recognition task, the subjects were given a word and instructed to identify on which line of the sign that word was located. In the legibility task, subjects were instructed which line to read (i.e., the top line). Researchers recorded the distance at which the subject identified the correct line or read the word correctly.

### What We Found...

The research activities conducted to fulfill the objectives of this research project led to the following conclusions.

- The laptop survey revealed no specific or consistent indications concerning the possible performance gains associated with the use of the Clearview font on negative contrast traffic signs.
- The daytime recognition analysis from the field study showed that the three alternative fonts provided statistically

similar recognition distances as the current FHWA font series.

- The nighttime recognition analysis from the field study showed that recommended straight replacement of FHWA font series with Clearview font series provided shorter recognition distances than the current FHWA font series. However, the results also showed that the next thicker stroke width version of the Clearview negative contrast font produced statistically similar recognition distances as the current FHWA font series.
- Both the daytime and nighttime legibility analyses from the field study showed that the three alternative fonts provided legibility distances statistically similar to those of the current FHWA font series.

The results of this research project show that the Clearview font provides the same performance as the current FHWA font series for negative contrast traffic signs. The only exception is the nighttime recognition, when the recommended straight replacement of Clearview does not achieve

similar recognition distances as the current FHWA font series until the stroke width is increased to the next weight (see Figure 1).

### The Researchers Recommend...

It can be argued that the recognition distance provided by traffic signs, particularly during nighttime conditions, is one of the most critical measures of effectiveness when assessing overall sign performance. Therefore, because there were no statistically significant increases in recognition or legibility distances for any of the Clearview fonts tested, and because the results of the nighttime recognition analysis showed an actual decrease in recognition distance when the FHWA font was replaced with the recommended Clearview font, the researchers recommend that TxDOT maintain its current practice of using the FHWA font series for negative contrast signs.

In addition, the preliminary analysis using sign layout software indicated that the substitution of the Clearview font would result in many standard signs exceeding the borders of the current sign blank sizes. This analysis demonstrated that modifications and adjustments would have to be made to each negative contrast sign (particularly warning and work zone signs) on an individual basis to check for the intrusion on the border.

Research recommendations are described in Report 0-4984-1, *Evaluation of the Clearview Font for Negative Contrast Traffic Signs*, that may lead to a revised version of Clearview for negative contrast signs.





## For More Details...

The research is documented in:

Report 0-4984-1, *Evaluation of the Clearview Font for Negative Contrast Traffic Signs*

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