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Report on Highway Guide Sign Fonts

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Joint Explanatory Statement House Report 115-237

Highway Guide Sign Fonts - The agreement prohibits funds from being used to enforce actions terminating the Interim Approval IA-5 of the Clearview font on highway guide signs. Section 125 of the Act directs FHWA to reinstate Interim Approval IA-5. FHWA is also directed to conduct a comprehensive review of the research on this alternative font and to report on its findings to the House and Senate Committees on Appropriations within 90 days of enactment of this Act. The report must document the safety and cost implications of the decision to terminate approval of Clearview font and fully address the comments submitted by affected States during the related December 13, 2016 request for information (FHWA Docket No. FHWA-2016-0036). The agreement does not include directives under the paragraph entitled "Highway Guide Signs Font" in Senate Report 115-138.

Executive Summary

Purpose

This report was directed by the Joint Explanatory Statement accompanying the *Consolidated Appropriations Act, 2018*, which was enacted on March 23, 2018. That direction was in response to the Federal Highway Administration's (FHWA) termination of Interim Approval No. 5 (IA-5) of the Clearview font on highway guide signs. The termination rescinded the provisional allowance of the use of a particular letter style other than FHWA Standard Alphabets on traffic control devices except as provided otherwise in the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) and within the IA-5 memorandum. Twenty-six States had been granted interim approval, but the termination affected only 13 States. The other 13 States either did not implement Clearview and, instead, retained the use of the Standard Alphabets, or had previously discontinued its use after a limited trial.¹ Thus, 38 State-level Departments of Transportation (DOT), including the District of Columbia and Puerto Rico, were not using Clearview under the Interim Approval and were using only the Standard Alphabets. This information is summarized in Table 2.4 of the report.

The FHWA noted in its termination that the presence and availability of two separate letter styles with differing criteria for use had resulted in significant confusion and inconsistency in sign design, fabrication processes, and application, with no overall practical improvement. After the publication of the termination, FHWA received comments from stakeholders suggesting that FHWA should have solicited public comment prior to the termination. Other comments suggested that FHWA did not consider all relevant research that was available in making its decision. As a result, FHWA published a Request for Information (RFI) in the Federal Register (81 FR 89889) to gather any information or research that FHWA might not have been aware of when the termination was prepared.

The purpose of the report is to:

- Document the results of FHWA's comprehensive review of the research on the Clearview alternative font
- Document the safety and cost implications of the decision to terminate Interim Approval IA-5 of the Clearview font on highway guide signs
- Address the comments submitted by affected States during the related December 13, 2016, request for information (FHWA Docket No. FHWA-2016-0036)

Overview

The following summarizes the findings in this report.

- **Additional Research on Clearview:** There were three reports and papers that were brought to the attention of FHWA as part of the RFI process. These reports were in addition to the ten reports that were already available and evaluated as part of the analysis that led to the termination of the Interim Approval. Each of the three documents was reviewed for both research approach and results validity. The three additional studies did not provide any evidence that refutes the analysis used in the justification for terminating the Interim Approval. In two of the research reports that were reviewed, there were several differences in the comparisons made between Clearview fonts and FHWA Standard Alphabet fonts (e.g. different intercharacter spacing, different letter heights, etc.) such that an objective comparison was not achieved. One report that has been cited as crediting Clearview with a 26-percent reduction in crashes clearly states that the font itself could not be attributed to any of this reduced crash experience because of the confounding of variables and other improvements that were made in the evaluation corridors. The available research is summarized in Table 3.1 of the report.

¹ One State reported discontinuing use after nearly a ten-year implementation due to challenges with compliance and the need for more extensive staff support to correct ongoing inappropriate use.

- **Safety and Cost Implications of Terminating Clearview Font Interim Approval:** There are no known negative safety implications related to the termination of the Clearview font. Clearview lettering had limited applicability due to its poorer performance in certain applications. Part of the basis for termination was to improve safety by streamlining and simplifying the sign design process, eliminating the various situations in which Clearview was being misused or misapplied.

While cost was not a consideration in the decision to terminate the Interim Approval, cost implications were requested as part of the report and are provided herein. The termination results in a cost savings. When consistent criteria are employed in the design and fabrication of typical freeway guide signs using Clearview, the overall sign size is on the order of 10 percent larger due to the larger proportions of the font compared to the Standard Alphabet font. In addition, the Clearview font is an add-on to basic highway sign design software programs that already include the Standard Alphabets in their cost. This add-on software requires an additional license fee that would apply to highway agencies, transportation design consultants, and traffic sign fabricators alike. The termination required agencies who were using the Clearview font to instead use the Standard Alphabets only in future guide sign installations. As there was no directive with the termination to remove and replace any signs, existing signs could remain in place. Signs ordered or fabricated using Clearview could still be installed, and agencies had a degree of discretion in determining whether construction documents in progress would be revised, depending on the extent of their development. Cost impacts are summarized in Table 4.1 of the report.

- **Comments submitted by affected States during the December 13, 2016, Request for Information:** The FHWA received 24 unique comment letters from various stakeholders including State DOTs, local agencies, toll authorities, associations, consultants, and private citizens. Six commenters, or one-quarter, agreed with the termination; sixteen disagreed with the termination; and two commenters indicated that FHWA should conduct additional research and studies on font types. Three additional commenters submitted letters in late 2017 and early 2018 stating that the interim use of Clearview should not be reinstated noting Congressional intent to do so at that time. One State provided an extensive narrative of its experience and challenges in implementing Clearview over several years, ultimately concluding that the use of the Standard Alphabets “ensures consistency of type across an entire sign panel, including positive and negative-contrast text, route shields, and other legend items.”

Actions Taken by FHWA since Enactment of the *Consolidated Appropriations Act, 2018*

On March 28, 2018, the FHWA reinstated the previously terminated Interim Approval No. 5 allowing the optional use of the Clearview letter style for positive-contrast legends on guide signs. This reinstatement allowed jurisdictions that had approval to use IA-5 prior to the January 25, 2016, termination to immediately start reusing Clearview per the provisions of the Interim Approval and the previously issued Design and Use Policy for Clearview Alphabet.² Per Section 1A.10 of the MUTCD, States and jurisdictions seeking permission to use the provisions of an Interim Approval for the first time must submit a written request to the FHWA and receive approval prior to use. The FHWA also posted responses to frequently asked questions related to the reinstatement and use of Interim Approval No. 5 on the MUTCD Web site.³ Finally, the FHWA prepared and submitted this report. A timeline of actions related to the Clearview Interim Approval is provided in Table 2.3 of the report.

² *Design and Use Policy for Clearview Alphabet* can be accessed at the following Web address: <https://mutcd.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm>.

³ Frequently Asked Questions Related to the Reinstatement of Interim Approval No. 5 – Clearview Font for Positive Contrast Legends on Guide Signs can be accessed at the following Web site: https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/faq/index.htm.

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ATSSA to FHWA, July 26, 2015

FHWA to ATSSA, September 16, 2015

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“Clearview highway font not clear enough for Grays Harbor,” April 30, 2014

Appendix C. FHWA Design and Use Policy

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1.0 Introduction

This report was directed by the Joint Explanatory Statement accompanying the *Consolidated Appropriations Act, 2018* (P.L. 115-141), which was enacted on March 23, 2018. That direction was in response to the Federal Highway Administration's (FHWA) termination of Interim Approval IA-5 of the Clearview font on highway guide signs. The termination rescinded the allowance of the use of letter styles other than FHWA Standard Alphabets on traffic control devices except as provided otherwise in the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD). The FHWA noted in its termination that the presence and availability of two separate letter styles with differing criteria had resulted in significant confusion and inconsistency in highway sign design, fabrication processes, and application with no practical improvement in sign legibility. After the publication of the termination, FHWA received comments from stakeholders suggesting that FHWA should have solicited public comment prior to the termination. Other comments suggested that FHWA did not consider all relevant research that was available in making its decision. In response, FHWA published a Request for Information (RFI) in the Federal Register (81 FR 89889) to gather any information or research that FHWA may not have been aware of when the termination was prepared.

The purpose of the report is to:

- Document the results of FHWA's comprehensive review of the research on the Clearview alternative font, including reports identified after the termination
- Document the safety and cost implications of the decision to terminate Interim Approval IA-5 of the Clearview font on highway guide signs
- Address the comments submitted by affected States during the related December 13, 2016, request for information (FHWA Docket No. FHWA-2016-0036)

The contents are organized as follows:

- Background
- Review of the research on the Clearview alternative font
- Safety and cost implications of the decision to terminate Interim Approval IA-5 of the Clearview font on highway guide signs
- Comments submitted by affected States during the related December 13, 2016, request for information
- FHWA's actions based on House Report 115-237
- Conclusion

2.0 Background

2.1 Introduction to Traffic Sign Lettering

Traffic sign lettering is optimized for rapid viewing and recognition at a range of traffic speeds and standardized so that signs can be designed to perform based on the short available viewing time by drivers. This is because the reading process for traffic signs differs greatly from the task of reading another media which is typically done from a stationary position at a relatively close distance. By contrast, for drivers to operate their vehicles in a relatively safe manner, they must view traffic signs at highway speeds only through short glances, which requires them to take their eyes and concentration away from the road and traffic around them. Therefore, the lettering on traffic signs is designed for quick recognition, as are all design aspects of signs—these factors include the amount of information; the size of lettering and any symbols; contrast between the colors of the legend and background; and spacing between words, lines of copy, and sign edges.

The design of traffic sign lettering itself comprises several factors. These include the shape of the letter, i.e., the letter form, and the space between letter pairs within a word. The collection of the letter forms (the shapes of each individual character) is commonly referred to as a “typeface.” The specific spaces between combinations of letters within the typeface is a component of what is commonly referred to as a “font.” In engineering terms, the “font” (the letter form and letter-pair spacing) is referred to as an “alphabet.” Hence, the sets of standard lettering for traffic signing are referred to as the Standard Alphabets. Terminology is summarized in Table 2.1.

Table 2.1. Terminology.

Print Media Publishing Terminology	Traffic Signing Design and Fabrication Terminology	Description
Character or Glyph	Letter Form	The shape or outline of a letter, numeral, or character.
Typeface	Letter Series	The complete set of characters or glyphs (letter forms).
Kerning	Spacing Criteria	The spaces between each pair of letters, numerals, or characters within the typeface.
Font	Alphabet	The complete set of letters, numerals, and characters and the spacing criteria that are used to compose individual words, numbers, and word combinations. Standard Alphabet letter series include Series B, C, D, E, E(modified), and F.
Typesetting	Sign Layout or Sign Design	The process of arranging combinations of letters and numerals to form words or numbers, and punctuation, to form phrases or sentences, along with the arrangement of those combinations on a common substrate.
Contrast Orientation	Positive-Contrast, Negative-Contrast	The relative brightness of legend and background colors of a sign. “Positive” contrast is a lighter-colored legend on a darker-colored background; “negative” contrast is a darker-colored legend on a lighter-colored background.

Within the Standard Alphabets are six variations of letter typeface or styles, called “Letter Series.” The letter forms of each letter series become progressively wider for a given letter height. In addition, the width of the letter stroke, i.e., thickness, also increases with each series. The Standard Alphabet letter series range from Series B, a narrow stroked and condensed letter form, to Series F, a broad letter form with wide stroke (see Figure 2.1). Series A was previously discontinued because it was unworkable in manual fabrication applications. Series E(modified) uses the same letter forms and spacing as Series E, but has a wider stroke. Each of the Standard Alphabet letter series contains a full set of numerals and limited set of special characters including punctuation that correspond to the letter forms and stroke widths of that series. The FHWA Standard Alphabet series letter forms are illustrated in Figure 2.1.



Figure 2.1. Illustration of Standard Alphabet Letter Series.

In addition to use on traffic signs, the Standard Alphabets are the official lettering specified by the Federal Aviation Administration for airside signing and markings on runways and taxiways, and are specified in Federal Motor Vehicle Safety Standards for lettering on vehicles, such as school buses. The Standard Alphabets are also the basis for roadway and airside pavement word markings, though in an elongated form for proper viewing on a horizontal surface from the position of a vehicle operator.

2.2 MUTCD Font Standard

The National MUTCD is incorporated by reference in 23 *Code of Federal Regulations* (CFR), Part 655, Subpart F and is recognized as the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel in accordance with 23 U.S.C. §§ 109(d) and 402(a). Part 2 of the MUTCD deals specifically with signs, including regulatory, warning, and guide signs used on conventional roads and streets, freeways and expressways, and toll roads. Part 2 also includes signs providing general information and services, tourist-oriented destinations, recreational and cultural interest areas, changeable message signs, and emergency management signing.

This report addresses the fonts used on freeway and expressway guide signs, which is the predominant and appropriate application of Clearview in the Interim Approval. Section 2E.14 of the MUTCD describes the provisions for the size and style of letters and signs for freeway and expressway guide signs. Paragraph 4 of that Section states, "...letters and numerals used shall be Series E(M) [E(modified)] of the 'Standard Highway Signs and Markings' (SHSM) book." Based on early research on alternative fonts indicating that other fonts might have increased legibility over the Standard Alphabets, the FHWA issued Interim Approval No. 5 for the Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5) on September 2, 2004. Due to concerns over uniformity and subsequent research that suggested there was no practical improvement, the FHWA officially terminated the Interim Approval on January 25, 2016, thus discontinuing the provisional use of an alternative letter style in traffic control device applications and, thereby, again requiring that the FHWA Standard Alphabets be used in traffic control devices, except as provided otherwise in the MUTCD.

2.3 Clearview Font

Research into developing an alternative font began in the 1990s, resulting in the final design of Clearview font letters in 2003. The goal of the Clearview font, as stated by its developer, was to increase legibility and reduce irradiation or "halation" of highway sign legends (the blurring of light around the edges of the sign legend when viewed at night under vehicle headlamp illumination creating a fog or "halo" effect) in comparison to that of the Standard Alphabets. Clearview font letters were developed specifically in an attempt to improve upon four legibility components that the developer believed to be of concern with the Standard Alphabets:

- Improve upon word messages to accommodate the needs of older drivers without increasing the letter height and the overall length and height of word messages and the signs themselves,
- Improve word pattern recognition by using mixed-case words of the same size composed of lower case letters designed for highway sign applications,
- Improve the speed and accuracy of destination recognition and the legibility distance of word messages, and
- Control or minimize the halation of words displayed on high brightness retroreflective materials for drivers with reduced contrast sensitivity.

While there were no demonstrated deficiencies with the Standard Alphabets, the developers worked to advance a new letter style with improved legibility. The stated goal was to rely exclusively on modifications to the new letter forms (shapes) and stroke width. However, when this process failed to compete with the legibility and recognition of the Standard Alphabets, the developer then turned to a different characteristic of legibility: the size and height of the letters themselves. Ultimately, the developers could not achieve comparable legibility to the Standard Alphabets until the size of the letters was increased 12 percent larger than the corresponding Standard Alphabet letters. Thus, for a typical freeway guide sign destination name, the standard 12-inch lower-case letter became 13.44 inches and the standard 16-inch upper-case letter became 17.92 inches. Further testing was then performed on Clearview to reduce the initial upper-case letter to 16 inches while retaining the lower-case height at 13.44 inches. Since letter sizes are specified by the height of the initial upper-case letter (from which the lower-case height is derived by proportion or ratio), this modification gave the perception that there was no increase in the size of the letters. In actuality, the lower-case letters with rising stems, such as "b" and "d," still extended to the full height of 17.92 inches. The comparison of letter forms and letter heights between the Standard Alphabets and Clearview is illustrated in Figure 2.2. Examples of signs with Standard Alphabet and Clearview lettering are shown in Figure 2.3.

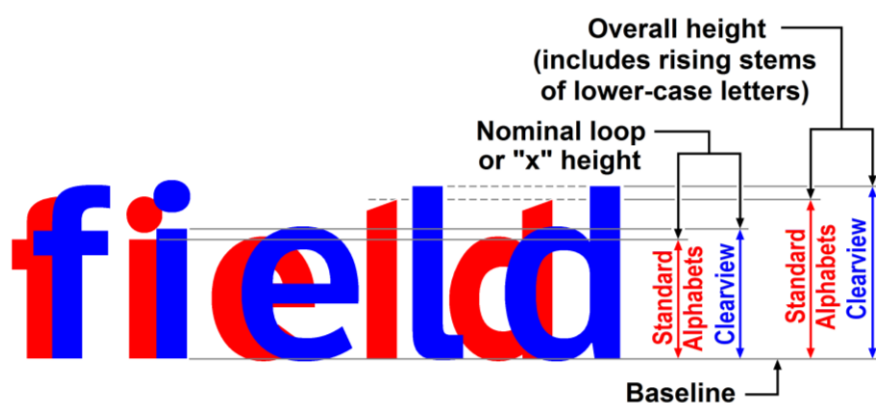


Figure 2.2. Comparison of Standard Alphabet Series E(modified) and Clearview Series 5-W.



Figure 2.3. Examples of Guide Signs with Standard Alphabets (left) and Clearview (right).

Companion testing was never performed to determine whether the same modifications to the Standard Alphabets would have resulted in a similar improvement. Rather, the Standard Alphabets, unaltered, were simply held as the baseline while the Clearview letters were worked and reworked until some improvement was eventually realized. This process did not result in a necessarily better set of letter styles for highway signing, but rather a different set of letter styles with increased letter height and different letter spacing that was not comparable to the Standard Alphabets. The Standard Alphabet letter series and intended corresponding Clearview letter series and contrast orientations are shown in Table 2.2. The “W” and “B” designations of the Clearview series were assigned by the developer and represent “white” and “black,” respectively, to distinguish between the letter colors that would most often be used in positive- and negative-contrast color orientations.

Table 2.2. Standard Alphabet and Corresponding Clearview Letter Series and Contrast Orientations.

Font	Standard Alphabets	Clearview	
	Positive or Negative	Positive Only	Negative Only
Series	B	1-W ¹	1-B ¹
	C	2-W ¹	2-B ¹
	D	3-W ²	3-B ²
	E	4-W ¹	4-B ¹
	E(modified)	5-W, 5-W-R ³	5-B ¹
	F	6-W ¹	6-B ¹

Notes:

1. Not evaluated for legibility; developer’s proposal for Standard Alphabet series replacement.
2. Evaluated for legibility; found to be less legible than corresponding Standard Alphabet series.
3. Evaluated for legibility; found to be comparable to corresponding Standard Alphabet series.

2.3.1 Interim Approval for Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5)

Interim Approvals issued by the FHWA grant authority to State and local highway agencies to use on an interim basis new traffic control devices or applications that are not specifically provided for in the MUTCD, but have been demonstrated to be effective through testing and evaluation. Such approvals are based on the results of successful experimentation, studies, or research, and an intention to place the new or revised device into a future notice of proposed amendments to the MUTCD. This process allows the traveling public and/or operating agencies to more quickly realize the safety and operational benefits associated with such devices or applications.

In 2002, the Pennsylvania Department of Transportation (DOT) requested that the FHWA grant Interim Approval for the use of Clearview on highway signs based on the early research finding that suggested improvement in sign legibility. Because the research findings were only narrowly applicable to certain applications, the FHWA issued Interim Approval with several expectations, including: (1) that research would continue so that the remaining gaps in the research could be answered and (2) the nature of the Interim Approval was provisional and would not constitute or guarantee adoption in the MUTCD. Thus, a provisional concept could continue to be evaluated and monitored in limited deployment so that a fully informed decision could be made when considering whether to adopt the provisional concept in the MUTCD. The FHWA issued Interim Approval for the Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5) on September 2, 2004.⁴ Since that date, the FHWA granted 26 State DOTs interim approval to use the Clearview font.⁵

Approval for Clearview was one of the earliest that FHWA had issued, within the first year that the provisions for Interim Approvals had been adopted into the MUTCD. In an effort to move new experimental technology into practice quickly using this new tool, the level of research scrutiny used to justify an interim approval was not as thorough or as rigorous as it could have been. In addition, FHWA had little experience with how Interim Approvals would be implemented by approved agencies. In the time since then, another 14 Interim Approvals allowing provisional uses of new traffic control devices or applications have been issued using the experience gained from these early approvals. As a result of the Clearview Interim Approval, the FHWA has taken a more deliberative approach to Interim Approvals that includes consideration of the long-term implications.

Although items for which an interim approval is granted are typically included in the next edition of the MUTCD, the Clearview font was not included in the 2009 Edition of the MUTCD. In response to the FHWA's Notice of Proposed Amendments (NPA) to the MUTCD, issued January 2, 2008 (73 FR 268),⁶ ATSSA, a State DOT, a research institute, and a traffic engineering consultant suggested that the FHWA add the positive-contrast Clearview font into the *Standard Highway Signs* publication and MUTCD based on the research done under the experimental use of the font that demonstrated significant legibility enhancements for older drivers. However, FHWA did not propose such an addition in the NPA. In the Federal Register notice of Final Rule for the 2009 Edition of the MUTCD, FHWA indicated that some research to date had shown that negative-contrast mixed-case Clearview legends are not as legible as the Standard Alphabets. As a result, the practicality of maintaining two separate alphabet systems, one for positive-contrast legends only (i.e., Clearview) and one for both positive- and negative-contrast legends (i.e., the Standard Alphabets), was taken into consideration (see Figures 2.4 and 2.5 for examples of signs in positive- and negative-contrast color orientations). In addition, the Clearview alternative alphabet did not undergo any testing on numerals and special characters, which had been reported to be problematic from a legibility standpoint, later confirmed through legibility testing, nor had any testing been performed on a narrower series that would typically be used on signs on conventional roads, such as Street Name signs. Accordingly, FHWA indicated it would be premature to categorically adopt the alternative alphabet for a marginal theoretical improvement in legibility where no supporting evidence of a demonstrable or practical improvement had been reported by those agencies that have erected signing using the alternate alphabets. The FHWA did indicate that highway agencies could continue to use the Clearview font for positive-contrast legends on guide signs under the provisions of the FHWA's Interim Approval IA-5.

⁴ Interim Approval for the Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5) can be accessed at the following Web address: https://mutcd.fhwa.dot.gov/res-ia_clearview_font.htm.

⁵ Although 26 States received approval, only 13 of those approved were using Clearview in some form at the time that IA-5 was rescinded.

⁶ Federal Register notice can be accessed at the following Web address: <https://www.gpo.gov/fdsys/pkg/FR-2009-12-16/pdf/E9-28322.pdf>.

In 2008, the FHWA began to include a summary of the research within its approval letters so that agencies could understand the intended use of Clearview and its limitations. When this failed to stem noncompliant practices and misuse, the FHWA issued more detailed design and use guidance in 2011 that included illustrations of acceptable and unacceptable uses and applications. This information was distributed to the States through the FHWA Division offices and posted on the MUTCD Web site for use by anyone. This, too, failed to stem what appeared to be even more widespread misapplication of Clearview. The FHWA also continued to receive technical inquiries in which it became apparent that there was a basic lack of understanding of the limitations on the use of Clearview, particularly at the local level where many municipalities and counties were under the impression that Clearview was now required and was superior to the Standard Alphabets in any and all uses. In addition, a number of unapproved Clearview series were commercially available from the developer and distributor that would, in effect, induce agencies to misapply the Clearview lettering in unapproved applications and in applications that FHWA had since recommended it not be used.

In April 2014, FHWA stopped issuing new approvals for the use of Clearview while it reconsidered whether Clearview would continue to be allowed. This fact was available to the public and was even publicized in news media.⁷ In October 2014, the FHWA's Office of Operations held a teleconference at the request of the Pennsylvania DOT's Bureau of Maintenance and Operations. In this teleconference, the State Traffic Engineer urged FHWA to consider all available research before making a decision about the future of Clearview. Pennsylvania DOT had since revised its specification so that only place names were displayed in Clearview. All other legends, such as exit numbers, distance messages (e.g., EXIT 1 MILE), and cardinal directions (e.g., NORTH) reverted to the Standard Alphabets. Thus, a complex design system was implemented in which a sign would be designed with two different letter styles with differing criteria. In July 2015, the American Traffic Safety Services Association (ATSSA) submitted a letter to the FHWA Administrator expressing concerns over confusion in the marketplace and amongst its membership by the presence of two standards. In this letter, ATSSA urged FHWA to make a prompt decision about the status of Clearview to minimize further confusion. In September 2015, FHWA responded to ATSSA's letter stating that it expected to announce action related to the status Clearview "in the coming weeks." Finally, in January 2016, the Interim Approval was terminated. A timeline of actions related to the Interim Approval is provided in Table 2.3. Correspondence related to the status of Clearview is provided in Appendix A. News media stating an intent to rescind Clearview is provided in Appendix B.

Many of the States implementing Clearview were receiving positive feedback on their new signs stating that they were easier to read. News articles also reported on this topic, often including interviews with the font developer and researchers, who further promoted the letter style. However, the fact that the new signs were most often replacing decades-old signs that were in poor condition was not reported. By contrast, the new signs were clean, used much brighter retroreflective materials integrating new sheeting technologies for improved nighttime viewing, and, in many cases, used larger lettering—thus resulting in much larger signs—than their predecessors. Anecdotally, the perceived improvement was attributed entirely to the font. This information unquestionably contributed to the confusion amongst State and local departments of transportation and other agencies. Many believed that Clearview was mandated as a replacement for the entire Standard Alphabets. Some believed that they could reduce letter sizes while attaining better legibility over the Standard Alphabets, essentially getting "credit" for using Clearview, as one inquiry to FHWA was phrased.

⁷ "Clearview highway font not clear enough for Grays Harbor," KXRO Newsradio, April 23, 2014, can be accessed at the following Web address: <https://kxro.wordpress.com/2014/04/30/clearview-highway-font-not-clear-enough-for-grays-harbor/>.



Figure 2.4. Examples of Signs in Positive-Contrast Color Orientations.



Figure 2.5. Examples of Signs in Negative-Contrast Color Orientations.

Table 2.3. Timeline and Summary of Actions Related to Clearview Font.

Date	Action
June 2002	Pennsylvania DOT requests FHWA allow use of Clearview.
November 2003	MUTCD incorporates new provision and process for Interim Approval.
September 2004	FHWA issues Interim Approval No. 5, authorizing provisional use of Clearview font.
March 2008	FHWA includes additional technical information in its approval letters for Clearview.
December 2009	FHWA publishes information in <u>Federal Register</u> explaining why Clearview was not considered for adoption in the new edition of the MUTCD.
November 2011	FHWA issues additional technical guidance on acceptable uses of Clearview.
April 2014	FHWA suspends issuing further Interim Approvals for Clearview.
October 2014	FHWA discusses long-term status of Clearview with Pennsylvania DOT via teleconference. Possibility of discontinuing is discussed.
July 2015	ATSSA expresses concerns over confusion in marketplace and amongst its members resulting from presence of two standards, urges FHWA to make prompt decision to minimize further confusion.
September 2015	FHWA announces it expects to take action related to Clearview “in the coming weeks.”
January 2016	FHWA issues <u>Federal Register</u> notice rescinding Interim Approval effective 30 days thereafter.
January 2016	FHWA issues Memorandum and Technical Brief. Memorandum details flexibilities and discretion in implementing the termination. Technical Brief details the engineering basis for the termination.
March 2016	FHWA provides technical assistance to Sen. Cornyn’s staff for Senate THUD majority language.
May 2016	FHWA provides technical assistance to Sen. Ernst’s staff regarding cost impacts to the affected States.
June 2016	FHWA informs AASHTO at annual Traffic Engineering (SCOTE) meeting of its willingness to consider new information, if available. AASHTO passes resolution requesting FHWA to reconsider its process for terminating Interim Approvals.
December 2016	FHWA issues <u>Federal Register</u> notice requesting information about the termination providing opportunity for public comment.
March 2017	FHWA provides technical assistance to Rep. S. Johnson’s staff regarding legislation to be introduced (“SIGN” bill).
May 2017	FHWA provides technical assistance to T&I minority staff.
June 2017	FHWA provides testimony to Rep. Culberson at budget hearing.
June 2017	FHWA provides technical assistance to Rep. Cuellar regarding status of FY17 appropriations language on receiving public comment regarding termination.
July 2017	FHWA provides technical review of FY18 House THUD bill language. This language, without FHWA’s recommended edits, is eventually enacted in the <i>Consolidated Appropriations Act, 2018</i> .
March 2018	<i>Consolidated Appropriations Act, 2018</i> , requires FHWA to reinstate Interim Approval allowing Clearview as it existed before January 2016 for remainder of fiscal year. A report to Congress detailing the safety and cost impacts is required within 90 days.
March 2018	FHWA issues memorandum reinstating Interim Approval for Clearview.
June 2018	Report to Congress due.

2.3.2 Termination of Interim Approval IA-5

On January 25, 2016, FHWA published a notice in the Federal Register (81 FR 4083) officially terminating, 30 days thereafter, the Interim Approval for Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5). The termination discontinued the provisional use of the Clearview font in traffic control device applications. The result of this termination rescinded the allowance of the use of letter styles other than FHWA Standard Alphabets on traffic control devices, except as provided otherwise in the MUTCD. The termination allowed existing signs with Clearview font and that comply with IA-5 to remain in place as long as they are in serviceable condition (i.e., until they require replacement due to wear or damage). The termination did not create a mandate for the removal or installation of any sign. States using Clearview at the time of the termination are summarized in Table 2.4.

Table 2.4. Status of States Using Clearview Under Interim Approval No. 5 at Time of Termination.

State	Interim Approval No.	Adopted Clearview	Clearview In Use on Jan. 25, 2016	Status at March 28, 2018 Reinstatement of IA-5
Alabama	IA-5.21	YES	YES	Adopted Clearview; discontinued 2017.
Arizona	IA-5.8	YES	NO	Multi-year trial; discontinued 2015.
Arkansas	IA-5.3	YES	YES	Adopted Clearview; discontinued following termination.
California	IA-5.19	NO	NO	Did not adopt.
Delaware	IA-5.26	YES	YES	Adopted Clearview; discontinued 2/24/2016.
Florida	IA-5.28	NO	NO	Did not adopt.
Hawaii	IA-5.23	YES	YES	Adopted Clearview; discontinued following termination.
Idaho	IA-5.2	NO	NO	Did not adopt.
Illinois	IA-5.7	YES	YES	Adopted Clearview; discontinued by policy directive, 1/1/2017.
Iowa	IA-5.13	NO	NO	Limited trial; did not adopt.
Kansas	IA-5.20	NO	NO	Limited trial; did not adopt.
Kentucky *	N/A *	NO *	NO *	Limited trial without Interim Approval; did not adopt.
Louisiana	IA-5.24	YES	NO	Adopted Clearview; discontinued per T.E. Manual, 4/29/2015.
Maine *	N/A *	NO *	NO *	Limited trial without Interim Approval; did not adopt.
Maryland	IA-5.11, 16	YES	YES	Adopted Clearview; discontinued 2016.
Michigan	IA-5.4	YES	YES	Adopted Clearview; discontinued by official guidance, 5/4/2016.
Nevada	IA-5.30	NO	NO	Limited trial; did not adopt.
New Jersey	IA-5.29	NO	NO	Limited trial; did not adopt.
New York	IA-5.6	NO	NO	Did not adopt.
North Dakota	IA-5.25	NO	NO	Limited trial; did not adopt
Ohio	IA-5.14	YES	YES	Adopted Clearview; discontinued 7/15/2016.
Oklahoma	IA-5.12	YES	YES	Adopted Clearview; discontinued 2016.
Pennsylvania	IA-5.1	YES	YES	Adopted Clearview; discontinued by technical directive, 2/26/2016.
South Carolina	IA-5.18	YES	YES	Adopted Clearview; discontinued following termination.
Texas *	N/A *	YES *	YES *	Adopted Clearview without Interim Approval; implementation inconsistent with Interim Approval. **
Vermont	IA-5.22	NO	NO	Limited trial; did not adopt.
Virginia	IA-5.5	YES	YES	Adopted Clearview; discontinued by technical directive, 1/29/2016.
West Virginia	IA-5.17	YES	YES	Adopted Clearview; discontinued 1/10/2017.
Wisconsin	IA-5.9, 27	NO	NO	Limited trial; did not adopt.

* State did not request or receive Interim Approval from FHWA as required by MUTCD § 1A.10.

** At the time of preparation of this Report, State has indicated intent to submit a request for approval.

Immediately following the publication of the termination in the Federal Register and prior to its effective date, FHWA distributed to the States a Technical Memorandum⁸ and a Technical Brief⁹ and posted these items on the MUTCD Web site for the general public. The Technical Memorandum provided guidance to the Federal-aid Highway division offices on implementation of the termination. The FHWA developed the Technical Brief for transportation agency use. It provided conclusions about the national experience with an alternative letter style and a discussion of the technical considerations that led to the termination of the Interim Approval. Key conclusions in the Technical Brief included:

- The study¹⁰ on which the Interim Approval was primarily based had a narrowly focused research statement, which examined the cumulative effect of a change to two variables – changing the type of retroreflective sheeting and the lettering style. The 6 percent improvement in legibility attributed to changing the type of retroreflective sheeting alone was not reported as a major finding. The practical difference attributed to the letter style was characterized by the researchers as “modest” and the apparent improvement of letter style could be “partially attributed to [its] increased size.” A 2014 study,¹¹ issued ten years after the Clearview font Interim Approval, found that there was no practical difference between Series E(modified) of the Standard Alphabets and 5-W of the Clearview letter style when tested in positive-contrast color orientations.
- The presence and availability of two separate letter styles with differing criteria resulted in significant confusion and inconsistency in the highway sign design and fabrication processes. Although the terms of the FHWA’s 2004 Interim Approval were explicit, misunderstandings and misapplications of the provisional letter style resulted. In 2011, the FHWA issued a Design and Use Policy¹² on this topic that included explicit criteria in question-answer format with photographic examples to illustrate acceptable and unacceptable practices. This additional guidance failed to allay these practices. Examples of unacceptable practices include:
 - Poor sign design due to lack of consistent implementation and inaccurate presumptions that lesser sign design criteria are acceptable, such as reduced interline and edge spacing.
 - Incorrect applications of Clearview font with many agencies, particularly local agencies, incorrectly believing that the letter style should be used in all applications and that all lettering should be displayed in upper- and lower-case lettering, regardless of the type of message.
 - Use of Clearview font letter style for negative-contrast color orientations, which was not part of the Interim Approval. Such use was specifically excluded from the Interim Approval due to its inferiority to the Standard Alphabets in negative-contrast color orientations.

After the publication of the termination, FHWA received comments from stakeholders suggesting that FHWA should have solicited public comment prior to the termination. Other comments suggested that

⁸ Technical Memorandum can be accessed at the following Web address:

https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/ia5_termination.pdf.

⁹ Technical Brief, “*Manual on Uniform Traffic Control Devices for Streets and Highways: Termination of Interim Approval No. 5, Clearview Font for Positive Contrast Legends on Guide Signs,*” can be accessed at the following Web address: https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/ia5_termtechbrief.pdf

¹⁰ Carlson, P.J. *Evaluation of Clearview Alphabet with Microprismatic Retroreflective Sheetings*, Report No. FHWA/TX-02/4049-1. Texas Transportation Institute, August 2001, Resubmitted October 2001.

¹¹ Miles, J., B. Kotwal, S. Hammond, and F. Ye. *Evaluation of Guide Sign Fonts*, Report No. MN/RC 2014-11. Texas A&M Transportation Institute, February 2014.

¹² *Design and Use Policy for Clearview Alphabet* can be accessed at the following Web address: <https://mutcd.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm>.

FHWA did not consider all relevant research that was available in making its decision. As a result, FHWA published a Request for Information (81 FR 89889) to gather any information or research that FHWA may not have been aware of when the termination was prepared. Chapter 3.0 summarizes research conducted to date on the Clearview font. Chapter 4.0 summarizes the comments to the Request for Information.

3.0 Research on Clearview

Research related to alternative fonts for signs has been ongoing since the 1990s. The early research led to FHWA's issuance of the Interim Approval for the use of Clearview Font for positive contrast legends on guide signs. Since the issuance of the interim approval, various organizations have continued to research highway sign fonts.

3.1 Early research to develop Clearview

The Clearview font was developed through research starting in the late-1990s. The stated goal of the Clearview font was to increase legibility and reduce halation of highway sign legends in comparison to that of the FHWA Standard Alphabets (to which the developers refer as "Highway Gothic font," even though "Gothic" historically has referred to letter forms of very intricate design, such as those used on newspaper mastheads, by contrast with the simple, non-stylized letter forms of the Standard Alphabets). Specifically, the first studies on Clearview stated that the intent was to replace the Standard Alphabets rather than also explore improvements thereto. This research development effort resulted in final design of Clearview font letters in 2003. The legibility of positive-contrast Clearview legends for guide signs was researched by the Pennsylvania Transportation Institute (PTI) and the Texas Transportation Institute (TTI).

The initial research on Clearview was conducted at PTI. In two PTI studies intended for conventional road guide signs, use of an early version of Clearview, called "Clearview-Bold," is reported to have improved nighttime sign reading distance by up to 16 percent when compared with Standard Alphabet Series E(modified). For drivers traveling at 45 mph, that legibility enhancement could translate into an additional 80 feet of reading distance, or 1.2 seconds of additional reading time. With Clearview-Bold, the desired destination legend is reported as being recognized 1.3 seconds earlier (84 feet) and with greater accuracy, giving the driver significantly more time to react to the information displayed.

By allowing a viewer to read the unique footprint of the word when displayed in upper- and lower-case letters, there is an increase in accuracy, viewing distance, and reaction time. The research reported that when the upper- and lower-case version of Clearview, called "Clearview-Condensed," is compared to the all-capital-letter Standard Alphabet Series D, there was a 14-percent increase in recognition when viewed by older drivers at night, with no loss of legibility. When the size of Clearview-Condensed was increased by 12 percent to equal the overall footprint of the upper-case display, the recognition gain is reported as having doubled to 29 percent with little change in overall sign size. The research did not include evaluation of upper- and lower-case letters using the Standard Alphabets. Because this study did not compare mixed-case (i.e., upper- and lower-case) lettering for both fonts, the result demonstrates only that a recognition (not pure legibility) task is aided by the use of mixed-case lettering rather than all upper-case lettering. It does not demonstrate that one font is superior to the other, nor is it appropriate for such a conclusion to be extrapolated. As a result of this finding, which actually confirmed known performance of lettering, the MUTCD was amended in 2009 to require that place and street names—those on which an observer most commonly uses a recognition task—be displayed using upper- and lower-case lettering, eliminating the option to use all upper-case lettering for these legends.

The first TTI research study compared full-scale freeway guide signs using the "Clearview-Bold" and Standard Alphabet Series E(modified) letter styles. Pilot testing at TTI indicated that there were significant differences in the legibility of full-scale signs as compared to the smaller signs tested in the previous PTI study, when viewed at design legibility distances (at that time legibility distance was considered 40 feet from sign per inch of letter height). The first upgrade to Clearview involved refinement of the font prior to the testing at TTI. The testing of Clearview by TTI compared the revised typeface to Standard Alphabet Series E(modified), again with no refinements or modifications to the Standard Alphabets.

Table 3.1. Research Studies Related to Clearview Font. (1 of 3)

<p><i>Traffic Control Design Elements for Accommodating Drivers with Diminished Capacity*</i> Staplin, L. K., K. Lococo, and J. Sim. 1990</p> <ul style="list-style-type: none"> ● Study is unrelated to fonts, but is the one on which the justification for future studies of Clearview was based ● Some indication of diminished visual acuity and recognition time in older participants during a study for a purpose completely unrelated to sign visibility ● Hypothesize an increase of 30% [to 20.75 in] in letter height might be needed, recommend as potential future research activity (letter height increase to 20.75 in was not a direct recommendation, for which there was no evidence basis) ● Evaluation tested words on low-resolution digital screen in Helvetica font, not Standard Alphabets ● Testing did not include nighttime viewing conditions under headlamp illumination, where visual disability is reportedly the broader problem
<p><i>Relative Visibility of Increased Legend Size vs. Brighter Materials for Traffic Signs*</i> Mace, D. J., P. M. Garvey, and R. F. Heckard. 1994</p> <ul style="list-style-type: none"> ● Study is unrelated to Clearview font, but provides limitations on hypothesis stated in Staplin et al (1990), which was used as assumptions in future Clearview studies ● Legibility and recognition do not improve in direct proportion to increases in letter height
<p><i>Effects of Font Capitalization on Legibility of Guide Signs</i> Garvey, P. M., M. T. Pietrucha, and D. Meeker. January 1997</p> <ul style="list-style-type: none"> ● Familiar legends using upper- and lower-case lettering more quickly recognized than legends in all upper-case lettering ● Research goal presupposed that "highway guide sign legibility could be improved [only] by replacing the 40-year-old guide sign font with a new font called Clearview" ● Refinement of the existing lettering was not considered and was not evaluated ● Reported as response to "an FHWA study that recommended a 20% increase in letter height on signs to provide greater reading distances for aging drivers. This 20% increase in letter height would result in an approximately 50% increase in sign area" ● 20% increase in letter height was not a recommendation of the FHWA study (Staplin et al, 1990) and was merely hypothesized in a conclusion of the actual results as an area for further study. Such an assertion cannot be taken as fact as the basis for this or future studies ● 20% increase in letter height was refuted by findings of Mace et al, 1994
<p><i>Legibility Comparisons of Three Freeway Guide Sign Alphabets*</i> Hawkins, H. G., M. D. Wooldridge, A. B. Kelly, D. L. Picha, and F. K. Greene. May 1999</p> <ul style="list-style-type: none"> ● Invalidates previous study (Garvey et al) due to its confounding of recognition with legibility in reporting the results ● Clearview ground-mounted signs were less legible than Series E(Modified) in daytime conditions ● In nighttime conditions, the ground-mounted Clearview did not demonstrate a consistently better performance than Series E(Modified)
<p><i>Required Letter Height for Street Name Signs: An On-Road Study</i> Smiley, A., C. Courage, T. Smahel, and G. Fitch. 2001</p> <ul style="list-style-type: none"> ● Study not applicable; comparison of Clearview to narrow, rectangular letter forms half the size ● Signs using Standard Alphabets had longer legibility distances than signs using Clearview ● Only valid conclusion regarding letter style is that larger letters are more legible than smaller letters ● Purpose of study to verify adequate letter height for newly adopted style and adequate placement at intersections ● Cannot conclude from this study that Clearview is superior to Standard Alphabets
<p><i>Improving Street Name Sign Legibility for Older Drivers</i> Chrysler, S. T., D. Tranchida, S. Stackhouse, and E. Arthur. October 2001</p> <ul style="list-style-type: none"> ● Older drivers (mean age 71) drove an instrumented vehicle under actual nighttime traffic conditions and were asked to read traffic signs temporarily erected for purposes of the study ● Test signs used Standard Alphabets and varied the brightness of the retroreflective sheeting ● Sign legibility distances were improved 21% to 30% by changing to higher-reflectivity materials

* Federal funds used by State or through University Transportation Center grant.

Table 3.1. Research Studies Related to Clearview Font. (2 of 3)

<p><i>Evaluation of Clearview Alphabet with Microprismatic Retroreflective Sheatings*</i> Carlson, P. J. August 2001, Resubmitted October 2001</p> <ul style="list-style-type: none"> ● Sign legibility improved when brighter retroreflective sheeting used, regardless of whether Standard Alphabets or Clearview ● Legibility of Standard Alphabets was improved when brighter retroreflective sheeting was used, as it was for Clearview ● Although the testing was conducted on Clearview 5-W, the sponsoring agency instead adopted a less legible version of Clearview (5-W-R) as a standard to reduce the sizes of signs, negating any potential for an improvement in legibility ● Invalidates previous study (Hawkins et al, 1999) due to likely learning effects by participants of 21 test words during evaluation ● "The results of the studies [Garvey et al, 1997; Hawkins et al, 1999] show promise but are not overwhelming. However, both studies have potentially fatal drawbacks such as small and inconsistent letter heights and the use of glass-beaded retroreflective sheeting instead of microprismatic sheeting. Therefore, no research results are available that address the legibility benefits of the Clearview alphabet when used at the appropriate size, with comparable Series E(Modified) letter heights, and with the appropriate type of retroreflective sheeting."
<p><i>Nighttime Legibility of Ground-Mounted Traffic Signs as a Function of Font, Color, and Retroreflective Sheeting Type*</i> Chrysler, S. T., P. J. Carlson, and H. G. Hawkins. September 2002</p> <ul style="list-style-type: none"> ● Standard Alphabets have longer legibility distances than Clearview ● Result characterized as "surprising" ● Retroreflective sheeting type was a significant factor with specific differences among sheeting types dependent on color
<p><i>Nighttime Guide Sign Legibility for Microprismatic Clearview Legend on High Intensity Background*</i> Holick, A. J. and P. J. Carlson. September 2003</p> <ul style="list-style-type: none"> ● Standard Alphabets have longer legibility distances than Clearview for Conventional Road signs ● Recommendation contradicts finding by concluding that sponsoring agency can use Clearview ● Microprismatic retroreflective legends on high-intensity backgrounds provide the longest legibility ● A stated objective of the study was to institutionalize Clearview because of sponsoring agency's procurement of 100 licenses for the font
<p><i>Evaluation of the Clearview™ Font for Negative Contrast Traffic Signs*</i> Holick, A., S. T. Chrysler, E. Park, and P. J. Carlson. January 2006, Resubmitted April 2006</p> <ul style="list-style-type: none"> ● Standard Alphabets have longer legibility distances than Clearview in negative-contrast color orientations, such as is found on regulatory and warning signs ● Reduction in nighttime recognition distance with Clearview ● Message had more effect on readability than font for regulatory and warning signs ● Message in Clearview generally intrudes on the sign border; larger sign would be required to attain equivalent performance ● Clearview use in negative-contrast is one of the most common misapplications found in practice
<p><i>Evaluation of the MAG Safety and Elderly Mobility Sign Project</i> Gray, R. and B. Neuman. September 2010</p> <ul style="list-style-type: none"> ● Preference survey investigated through field survey--mix of Standard Alphabets and Clearview, cannot verify which signs received positive feedback ● New signs considerably larger than old signs; public reaction likely based on greater conspicuity of larger sign than on font ● Evaluated through low-resolution tabletop simulator, which cannot accurately simulate retroreflective sheeting effects for nighttime viewing conditions or navigational variations due to font ● Indicated that sign sizes decreased, which is not possible due to the larger letter height of Clearview; review of signs installed indicates that sign sizes actually increased ● Stated objection to termination is based on the agency having extensively promoted Clearview

* Federal funds used by State or through University Transportation Center grant.

Table 3.1. Research Studies Related to Clearview Font. (3 of 3)

<p><i>Clearview™ Font in Illinois: Assessing IDOT Experiences and Needs*</i> Mahmassani, H. S., C. Frei, and M. Saberi. January 2013</p> <ul style="list-style-type: none"> • Results based only on preference survey in uncontrolled environment • Recommendation to continue use Clearview and discard present standard based on "lack of complaints" about new signs • Inconsistent with objective professional methods to develop technical standards and specifications • Results corroborate past evidence that sheeting materials may influence legibility regardless of font
<p><i>Evaluation of Guide Sign Fonts*</i> Miles, J., B. Kotwal, S. Hammond, and F. Ye. February 2014</p> <ul style="list-style-type: none"> • Standard Alphabets have longer legibility distances than Clearview numerals • No practical difference otherwise when testing conditions are comparable
<p><i>The Legibility of the Clearview Typeface System versus Standard Highway Alphabets on Negative- and Positive-Contrast Signs*</i> Garvey, P.M., M. J. Klena, W. Eie, D. Meeker, and M. T. Pietrucha. February 2015</p> <ul style="list-style-type: none"> • Standard Alphabets (present standard) have longer legibility distances than Clearview • Testing methods not transparent • Comparisons did not use equivalent baseline conditions • Testing conditions skewed by modifying one font, but not the other, similar to past studies
<p><i>Evaluation of Michigan’s Engineering Improvements for Older Drivers</i> Kwigizile, V., J. Oh, R. Van Houten, D. Prieto, R. Boateng, L. Rodriguez, A. Ceifetz, J. Yassin, J. Bagdade, and P. Andridge. September 2015</p> <ul style="list-style-type: none"> • Reported 26% crash reduction cannot be attributed to the font • Variables were confounded in the test corridors • Crash reduction followed national trend, indicating that other factors were more likely responsible for crash reduction • Control corridors in which improvements were not similarly made also experienced similar crash reductions
<p><i>Empirical Assessment of the Legibility of the Highway Gothic and Clearview Signage Fonts</i> Dobres, J., S. T. Chrysler, B. Wolfe, N. Chahine, and B. Reimer. 2017</p> <ul style="list-style-type: none"> • Evaluation not applicable to highway signing (evaluated in-vehicle digital displays) • Did not use conditions, such as nighttime retroreflectivity, that simulate actual conditions under which a driver would view a sign • Researchers conclude that Standard Alphabets could be similarly refined to improve legibility (i.e., replacement with completely new letter style is not needed to improve legibility)

* Federal funds used by State or through University Transportation Center grant.

The researchers evaluated shoulder- and overhead-mounted highway guide signs on Type III retroreflective sheeting. In this study, the revised version of Clearview was reported to have performed “no worse than, and in some cases outperformed, Series E(modified).” TTI then performed a second study of the two fonts, this time using microprismatic retroreflective sheeting, the type now predominantly used on highway signs. The results reported an 11- to 12-percent increase in the legibility distance for guide signs using Clearview.

This study also demonstrated that there was an improvement to Series E(modified) when using microprismatic retroreflective sheeting. However, because of the very specific and narrowly focused research hypothesis, this finding was not reported in the conclusion or in the abstract of the study report. Rather, it was found only within the body of the report itself. In the recommendations, the researchers note, “[b]esides, TxDOT already owns approximately 100 licensed versions of Clearview...” and “TxDOT has provided a sign manufacturer one licensed version of Clearview (to be used for TxDOT signs, exclusively).”

3.2 Additional research to expand Clearview following issuance of the Interim Approval

A number of additional research studies on Clearview continued following the issuance of Interim Approval IA-5 in 2004. These efforts, consistent with the developer's originally stated goal of creating a complete replacement for the Standard Alphabets, focused on expansion of the font to guide signing for conventional (non-freeway) roadways and negative-contrast color orientations that would be intended for standard signs, such as regulatory and warning signs. In all, thirteen recent studies were available to inform FHWA's decision to rescind IA-5 allowing provisional use of the Clearview font. Ten of these studies specifically evaluated the Clearview letter style. Only one of these studies considered like modifications to the Standard Alphabets when evaluating against Clearview. Three additional studies, all evaluating the Clearview letter style, became available following the termination of Interim Approval IA-5. The results and analyses of the major research evaluations related to Clearview are summarized in Table 3.1.

3.3 Implementation of Clearview Font under Interim Approval IA-5

Although the research upon which the Interim Approval for the use of the Clearview font was based on only one series of this lettering style, the Interim Approval was written in a way that would authorize narrower letter forms to correspond to the system of the FHWA Standard Alphabets. The FHWA did this in anticipation of successful future research evaluations. However, subsequent evaluations showed no benefit to the narrower letter forms and degraded sign legibility when compared to the corresponding FHWA Standard Alphabet series.¹³ In addition, tests of alternative lettering in negative-contrast color orientations (darker legend on lighter background, such as for regulatory and warning signs) showed no improvement and significantly degraded legibility of the sign.¹⁴ Ultimately, the consistent finding among all the research evaluations was that the brightness of the retroreflective sheeting is the primary factor in nighttime legibility.

The presence and availability of two separate letter styles with differing criteria have resulted in significant confusion and inconsistency in highway sign design, fabrication processes, and application. Although the terms of FHWA's 2004 Interim Approval are explicit, there have been misunderstandings and misapplications of the provisional letter style. Inconsistent sign design practices have become more common and appear to have coincided with the provisional allowance of an alternative lettering style due to a lack of consistent implementation and inaccurate presumptions that lesser sign design criteria, such as reduced interline and edge spacing, are broadly acceptable. In addition, many agencies believed that the alternative lettering style should be used in all applications and that all lettering should be displayed in upper and lowercase lettering, regardless of the type of message. There was also considerable confusion that the requirement of the MUTCD to display destination and street names in upper and lowercase lettering equates to the use of the provisional lettering style rather than the Standard Alphabets. In actuality, there is no interdependency between letter style and case. The lack of uniformity associated with the use of Clearview font led FHWA to post a Design and Use Policy for the Clearview alphabet¹⁵ on the MUTCD Web site in 2011.

3.4 Research reports brought forth after IA Termination

In addition to the ten research reports that were previously available, there were three additional reports and papers that were brought to the attention of FHWA as part of the RFI process following the

¹³ Chrysler, S.T., P.J. Carlson, and H.G. Hawkins. *Nighttime Legibility of Ground-Mounted Traffic Signs as a Function of Font, Color, and Retroreflective Sheeting Type*, Report No. FHWA/TX-03/1796-2. Texas Transportation Institute, September 2002.

¹⁴ Holick, A., S.T. Chrysler, E. Park, and P.J. Carlson. *Evaluation of the Clearview™ Font for Negative Contrast Traffic Signs*, Report No. FHWA/ TX-06/0-4984-1. Texas Transportation Institute, January 2006, resubmitted April 2006.

¹⁵ *Design and Use Policy for Clearview Alphabet* can be accessed at the following Web address: <https://mutcd.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm>.

termination. The FHWA reviewed each of the three documents for both research approach and results validity. A summary of FHWA's review of each follows:

*The Legibility of the Clearview Typeface System versus Standard Highway Alphabets on Negative- and Positive-Contrast Signs.*¹⁶ The purpose of this research report was to compare legibility distances of both negative- and positive-contrast signs under both daytime and nighttime conditions with both older and younger motorists. Reported as the first part of a three-step research effort, the goal was to “identify the relative legibility of the Clearview negative-contrast typeface compared to Standard Highway Series Alphabets and to evaluate the effect of using mixed-case versus all-upper-case words (the current standard) on signs that require a legibility task.” Presumably, the ultimate goal of this research would result in completely redesigning the nearly 2,100 standard sign designs in the MUTCD that are currently used on the nation's streets and highways. The report did not describe the study procedure in enough detail to understand how many signs were viewed, the font and word combinations that were used, or the order of presentation, all of which could influence the participants in the research and change the research outcome. While some of the reported results seem to indicate that Clearview outperformed the Standard Alphabets, data provided in the report revealed that the Standard Alphabet upper-case letters, the present standard, had longer legibility distances for older drivers than either Clearview mixed-case or Standard Alphabets mixed-case, the only other letters used for comparison. One of the conclusions of the report indicated that the Clearview typeface in mixed-case is as legible as Standard Highway in all upper-case but takes up less sign space, possibly implying that the reduction in sign space alone is worth considering. The researchers did not state how much less space is occupied. FHWA's analysis reveals that the difference would be negligible and would not affect overall sign size, as sign blanks are sized in 6-inch increments for standardization and economies of scale. The researchers also did not consider that adjusting the intercharacter spacing for Standard Alphabet letters might have resulted in similar legibility distances for both fonts, thereby negating any advantage. Similarly, expanded spacing of the Standard Alphabet lettering in mixed-case was not considered. Ultimately, a review of the actual mean legibility distances provided in tabular form in the report showed that in 5 out of 6 comparisons, sign legends using the Standard Alphabet upper-case letters only, the present standard, had longer legibility distances for older drivers than both Clearview mixed-case and Standard Alphabet mixed-case legends.

*Empirical Assessment of the Legibility of the Highway Gothic and Clearview Signage Fonts.*¹⁷ This report assessed the differences in legibility of Clearview versus Standard Alphabets in positive- and negative-contrast applications. FHWA found the research testing to be well-designed, the concepts well-described, and reasoning for use of the selected methodology well-explained. However, FHWA also found limitations of the research itself in that it did not compare the commonly used letter series (both for Clearview and Standard Alphabets) and letter forms, upper- and lower-cases, during the testing. The testing included Clearview series 5-W and 5-B, however some States use 5-W-R for their guide signs, a much narrower intercharacter spaced form of 5-W that results in smaller signs, but negates any of the reported legibility benefits of the letter style. When looking at signs with negative-contrast legends (darker legend on a lighter background used on regulatory and warning signs) it compared Clearview against the Standard Alphabet Series E(modified), but Series D is what is predominantly used for these signs. Therefore, the benefits of one letter series versus another could be overstated or understated. Without a more detailed field investigation in which consistent variations in letter design are tested against each other to determine the specific elements leading to legibility improvements, it is impossible to ascertain any improvement from the use of an alternative letter style. Moreover, this study used the

¹⁶ Garvey, P.M., M.J. Klena, W. Eie, D. Meeker, and M.T. Pietrucha, PSU-2013-02, *The Legibility of the Clearview Typeface System versus Standard Highway Alphabets on Negative- and Positive-Contrast Signs*. Pennsylvania Transportation Institute, February 2015.

¹⁷ Dobres, J., S. T. Chrysler, B. Wolfe, N. Chahine, and B. Reimer. “Empirical Assessment of the Legibility of the Highway Gothic and Clearview Signage Fonts” (2017) *Transportation Research Record: Journal of the Transportation Research Board*, 2624, pp 1-8.

same procedure that was used in a previous study by the same research team. This procedure was determined to be flawed under a subsequent study¹⁸ that found the reported measured legibility distance was exaggerated due to the subjects having learned the test words in early trials and confounding recognition distance as part of legibility distance.

*Evaluation of Michigan's Engineering Improvements for Older Drivers.*¹⁹ This project aimed at evaluating safety benefits of a number of countermeasures used by Michigan Department of Transportation (MDOT) as part of a program to address needs of older drivers. The countermeasures included use of the Clearview font on guide signs, installation of box span signals, installation of pedestrian countdown signals, use of fluorescent yellow sheeting on warning signs, and use of arrow-per-lane signs for guide signs. The evaluation included a perception survey of Michigan drivers, development of Safety Performance Functions, and development of Crash Modification Factors (CMFs). As stated in the research report, MDOT implemented the use of fluorescent yellow sheeting just prior to adoption of the Clearview fonts, so the two countermeasures have been installed together. As a result, it was impossible to collect individual data and conduct an independent evaluation of Clearview font on guide signs. While the researchers tried to compensate for dual countermeasures by calculating CMFs based on looking at areas where only fluorescent yellow sheeting was used and other sites where both Clearview and fluorescent yellow sheeting was used, replacing old sheeting in diminished conditions with new sheeting likely provided a large portion of the difference in legibility, as has been indicated in previous studies. Further, in an investigation of one of the routes examined, other improvements, including resurfacing, restriping, installation of rumble strips, and new installations of guard rail occurred with the installation of the new signs using Clearview. Therefore, the change in crash rates can be attributed to any number of these other improvements rather than the font used on the signs. The FHWA believes that while preference surveys can be useful in determining opinions about various topics, their usefulness in objectively evaluating or quantifying benefits of improvements is unfounded and generally not accepted as definitive in research. In this particular research, the participants were asked to provide opinions on photographic examples that varied in not only letter style, but also in color of sign sheeting, underlining of text, and destination names used on the signs. Photographs cannot simulate the driving task and performance under headlamp illumination. As a result, it is neither possible nor appropriate to attribute the findings to Clearview specifically.

None of this research, nor other research reviewed by FHWA, indicates that Clearview font performs better than Standard Alphabets when using similar design elements, such as case, ratio of upper- to lower-case letters, intercharacter spacing, and age and type of sign sheeting.

¹⁸ Carlson, October 2001.

¹⁹ Kwigizile et al, RC 1636, *Evaluation of Michigan's Engineering Improvements for Older Drivers*. Western Michigan University, September 2015.

4.0 Safety and Cost Implications of Termination of IA-5

One of the provisions in the Joint Explanatory Statement was to document the safety and cost implications of the decision to terminate approval of Clearview font. These implications are difficult to quantify at this point in time, however the following sections contain qualitative information.

4.1 Safety Implications

There are no known negative safety implications related to the termination of IA-5. Although some research suggests improved legibility of signs with Clearview font, the differences in sign sheeting, letter heights, research methods, etc., make it difficult to draw a direct correlation between the use of Clearview font and improved safety on roads open to public travel. As a result, terminating the use of Clearview font did not have a negative impact on public safety. Given the widespread misapplication of Clearview, in part, due to the complexities of having two completely differing systems and criteria, the termination was expected to have a positive impact on uniformity in sign designs and performance, and, ultimately, positively impact safety through operational efficiency.

4.2 Cost Implications

The termination did not create a mandate for the removal or installation of any sign. Existing signs with Clearview font that comply with the Interim Approval were unaffected by the termination and were allowed to remain as long as they are in serviceable condition. The termination did not amend any provisions within the MUTCD.

The 13 States using Clearview font at the time of the termination had to make provisions for discontinuing its use. As indicated in the Technical Memorandum,²⁰ FHWA provided flexibility for States to implement the termination. States were allotted discretion in implementing the change for projects or signs that were in the process of design or fabrication, as well as for updating design manuals, standards, and other documents. Any costs associated with these changes are incidental to routine program administration. The change was communicated within agencies through departmental memorandum or directive. Eventually, design manuals and standard documents would have to be updated to reflect this change. However, these changes typically occur on a periodic cycle that then incorporates any of the departmental memoranda or directives that have been issued since the previous update of the design manual and standard documents. Therefore, these costs are incidental to the overall cost of the periodic updates. It should be emphasized that the termination of Clearview did not involve a wholesale change from one font to another because the Standard Alphabets were still required for use in the majority of signing applications, regardless of whether a State adopted Clearview for its guide signs. As stated earlier, Clearview had very limited applicability, making the sign design process actually more complex rather than simpler. There was no inherent cost in reverting to the Standard Alphabets exclusively because the States already had the associated software and other tools to design and fabricate signs using the Standard Alphabets.

Incremental costs associated with using the Clearview font are estimated in Table 4.1. The destination names on the sample signs used in this analysis are based on the most common postal address names in the United States.²¹ The sample sign legends represent up to the maximum amount of information recommended in the MUTCD,²² ranging between one destination with a distance message, and two destinations, a route number, and a distance message. There are no practical cost impacts associated with the termination of the Clearview Interim Approval, which results in a net cost savings.

²⁰ Technical Memorandum can be accessed at the following Web address:

https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/ia5_termination.pdf.

²¹ United States Postal Service. "Ten Most Common Post Office Names in 2017" can be accessed at the following Web address: <https://about.usps.com/who-we-are/postal-history/post-offices-facilities.htm>.

²² MUTCD, 2009 Edition, § 2E.10, "Amount of Legend on Guide Signs."

Table 4.1. Incremental Costs of Sign Panels Using Clearview Letter Style.

Item	Quantity or Unit	Incremental Cost ^{1,2}	
		Standard Alphabets	Clearview
Sign Design Software	1 - 100 ³	Base	Base
Standard Alphabets Electronic Font ⁴	1 - 100 ³	\$0	\$0
Clearview Electronic Font	1 - 100 ³	N/A	\$800 - \$15,000
Sign Panel ⁵	8 - 20 S.F.	Base	\$200 - \$1,200 per Sign

Notes:

1. Costs are for a State transportation agency. Additional costs for design consultants and commercial sign manufacturers are not included.
2. Additional costs for sign support structures could not be estimated due to variabilities in design standards among the States. Larger signs would result in the need to replace existing sign support structures in cases in which there is no additional structural capacity in the existing sign support structure.
3. 100 units for electronic software based on data from a large State.
4. Typical highway sign design and production software packages include the Standard Alphabet electronic fonts at no additional cost.
5. Sign panel costs are for a typical freeway guide sign displaying 1 to 2 destinations, distance message, and route marker as shown in Figure 4.1. Unit cost ranges between \$25 and \$60 per square foot of sign area and varies based on region and size of project. Incremental cost shown is for a single sign. Incremental cost of sign is due to increased size resulting from larger lettering and interline and edge spacing resulting from the use of Clearview font.



Figure 4.1. Typical Freeway Guide Sign Legends Used for Cost Analysis.

5.0 Comments submitted by affected States during the related December 13, 2016, Request for Information

The FHWA received 27 docket comment letters, 24 of which were unique letters and 3 exact duplicates of other letters, plus an additional three unique letters in 2017 and 2018. The docket letter responses included a variety of affiliations: 9 from State departments of transportation (DOTs), 2 local agencies, 2 toll authorities, 3 national professional associations, 1 traffic engineering consultant, and 7 private citizens. Six commenters agreed with the termination, sixteen disagreed with the termination, and two commenters expressed no opinion on the termination but rather indicated that FHWA should conduct additional research and studies on font types. Three additional commenters, including one from a sign manufacturer, submitted letters in late 2017 and early 2018 stating that the interim use of Clearview should not be reinstated noting Congressional intent to do so at that time.

Of the nine State DOTs that submitted comments, seven disagreed with the IA Termination. One State DOT assumed, incorrectly, that using Clearview allowed it to avoid “making signs with the Standard Alphabets that are 16 percent wider and 16 percent higher” in order to achieve a 16 percent improvement in legibility distance, referring to an early study that suggested such an increase in legibility distance when using Clearview over the Standard Alphabets.²³ Another State DOT indicated that, prior to the termination of IA-5, it had nearly completed a transition from Clearview back to the Standard Alphabets due to challenges the agency encountered when implementing Clearview, having gained practical experience with it over the previous ten years. The agency concluded that the use of the Standard Alphabets “ensures consistency of type across an entire sign panel, including positive and negative-contrast text, route shields, and other legend items.” The detailed narrative of these issues that was provided addressed the “mixed message stemming from Clearview publicized as a ‘superior typeface.’” The commenter attributed “[a]rticles and reports that implied Clearview was text was preferable for all sign types” to agency “time and resources [that] were consumed by the need to explain the reasons for” the limitations on the uses of Clearview to sign designers, even though the limitations were detailed in IA-5. The agency also provided cost information, reporting that the additional cost for the electronic Clearview font was \$525 for each of its approximately 40 workstations [approximately \$21,000] in addition to its basic sign design software. The remaining commenter did not provide an affiliation with a specific State; rather, the commenter identified as a State DOT Traffic Engineer. That individual stated that, “the limitations of the Clearview Interim Approval make it inefficient for designers, and increase the probability of incorrect designs and a lack of uniformity” and suggested that “FHWA should drive the process by pursuing independent research that determines how to optimize letter legibility, and that result should be the required alphabet.”

Maricopa Association of Governments (MAG) and Maricopa County Department of Transportation (MCDOT) were the only local agencies to comment. MAG, the Metropolitan Planning Organization for the Phoenix, Arizona, metropolitan region, indicated that it had approved nearly \$82,000 in funding for and promoted the use of Clearview font as a roadway safety improvement and, therefore, disagreed with the termination. MCDOT provided statistics regarding the number of signs, cost, and installation of signs using Clearview font. MCDOT suggested that costs were reduced because the new signs were smaller than the signs they replaced. However, a cost comparison was not provided and, in an investigation of the new installations, the newer signs were notably larger than the signs that they replaced. Further, it would not be possible for the newer signs to be smaller than the existing signs if the same height of Clearview lettering were used with its required letter spacing. MCDOT stated further that the new signs at major intersections, were, in fact, larger than the signs that they replaced. The increase in the size of the signs alone would have improved their conspicuity, regardless of the font used, likely contributing to the perception of improvement. In addition, the new signs at major intersections used mixed-case lettering

²³ Early reports of significant improvement in legibility distance were refuted by subsequent studies that found variables had been confounded; these studies are discussed in Section 3.1 of this report.

where the signs they replaced used all upper-case letters and in a much smaller letter height. Either one or both of these changes would have improved recognition and legibility regardless of the selection of Clearview over the Standard Alphabets. Therefore, it is not appropriate to attribute the perceived improvements to Clearview. Neither agency provided information on how the use of Clearview improved safety.

The two toll authorities disagreed with the IA termination. The Pennsylvania Turnpike Commission indicated that it has installed guide signs with Clearview on a large portion of its network and, “[has] not received a single complaint nor have we been notified of any safety concerns regarding our signing policies as they relate to the use of the Clearview font.” Similarly, the Central Florida Expressway Authority indicated that it has guide signs with Clearview font on over 90 percent of its system and has had “only positive experience.” The Central Florida Expressway Authority stated that it was furnished a complementary license for the Clearview font software for use on its system. Neither agency provided data or other information on safety impacts.

Of the three associations submitting comments, the American Traffic Safety Services Association (ATSSA) agreed with the termination of IA-5. The Institute of Transportation Engineers (ITE), referencing the National Committee on Uniform Traffic Control Devices (NCUTCD) letter, disagreed with the termination, suggesting that FHWA either sponsor dialogue and debate with traffic control device human factors researchers on the subject or engage in a third-party independent review of existing Clearview research.

One traffic engineering consultant provided comments, which agreed with the IA termination. The commenter stated that even with the additional guidance that FHWA had issued, “there was still widespread inappropriate use of the font, which have traditionally not been issues with FHWA [S]tandard [A]lphabets in the past.” The commenter explained an experience with attempting to purchase true-type fonts in both FHWA Standard Alphabets as well as Clearview from a commercial vendor. The commenter was informed that, although the company had digitized the Clearview font from the FHWA’s published letter form details,²⁴ the vendor was served with a cease-and-desist notification from the “owners” of Clearview stating that the company could not sell the font.

Seven private citizens responded to the docket but did not provide their company affiliation. Four of the citizens agreed with the termination, while two disagreed. One commenter, rather than agreeing or disagreeing with the termination, suggested potential tests to provide a better comparison between alphabet fonts.

Several agencies referenced the research described in Section 3.3 earlier in this report.

Three additional commenters, including a sign manufacturer, submitted letters in late 2017 and early 2018 stating that the interim use of Clearview should not be reinstated.

²⁴ The FHWA has published the letter form details for both the Standard Alphabets and Clearview letters, which are in the public domain. The purpose publishing these details is so that the letters can be replicated with accuracy, including for use as an electronic font, and including for the purpose of selling the electronic font on the open market. In general, there are no restrictions on who may produce the traffic control devices adopted in the MUTCD, or under official experimentation or Interim Approval under the provisions of the MUTCD, including if the purpose is commercially market them.

6.0 FHWA's Actions based on House Report 115-237

On March 28, 2018, the FHWA issued a memorandum reinstating the previously terminated Interim Approval 5 allowing the optional use of the Clearview letter style for Positive Contrast Legends on Guide signs. This reinstatement allowed jurisdictions that previously had approval to use IA-5 prior to the January 25, 2016 termination to immediately start reusing Clearview per the provisions of the Interim Approval and the previously issued *Design and Use Policy for Clearview Alphabet*.²⁵ Per Section 1A.10 of the MUTCD, States and jurisdictions seeking permission to use the provisions of an Interim Approval for the first time must submit a written request to the FHWA and receive approval prior to use. The FHWA also posted responses to frequently asked questions related to the reinstatement and use of Interim Approval 5 on the MUTCD Web site.²⁶

²⁵ *Design and Use Policy for Clearview Alphabet* can be accessed at the following Web address:

<https://mutcd.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm>.

²⁶ Responses to Frequently Asked Questions Related to the Reinstatement of Interim Approval No. 5 – Clearview Font for Positive Contrast Legends on Guide Signs can be accessed at the following Web address:

https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/faq/index.htm.

7.0 Conclusion

A number of conclusions can be drawn from the experience in administering the provisional use of the Clearview font. First, it is clear that there is an impact to allowing multiple fonts in sign design and manufacture. These impacts are evident from a significant amount of misunderstanding surrounding the appropriate or acceptable use(s) of the Clearview font that was reported in response to the Request for Information. To this end, the uniformity and standardization in traffic control devices that was established to help road users easily and instantly recognize and react to cues along the road also help the designers, manufacturers, and managers of these devices ensure that they are designed with consistency to achieve that purpose. Second, when implemented in accordance with the terms of the Interim Approval and the Design and Use policy, sign sizes will increase when the Clearview font is used in place of the Standard Alphabets. In other words, the font cannot simply be “substituted” into a sign layout or standardized template without many adjustments being made to the sign layout that affect readability. Third, there are additional costs associated with the use of the Clearview font and, thus, an inherent cost savings associated with the termination of the Interim Approval. These additional costs are evident in larger sign sizes, additional staff time required to educate and re-educate others in acceptable and allowable uses of the font due to its more nuanced criteria, and costs for the add-on software. While a few early adopters report being furnished complementary licenses for the font software by its developer, this was not the case for the majority of the States that adopted the font, nor would it have applied to other entities involved in the sign design and fabrication processes, such as design consultants and sign manufacturers that would then be required to purchase the software because the client agency had specified Clearview.

In addition to the direct impacts of the use of the Clearview font, several conclusions can be drawn about the overall processes used to develop, issue, and rescind Interim Approvals, as well as communication and outreach to stakeholders. These are discussed in this Section.

7.1 Additional information regarding the Clearview fonts

No new information was submitted to the RFI that would indicate Clearview font provided superior legibility over the Standard Alphabets. Similarly, none of the additional information addressed the shortcoming of the alternative letter style in regard to its limited applicability or the limited scope or focus of the past or more current research efforts.

7.2 Communication and outreach regarding FHWA actions

When FHWA issued the termination for the IA-5, it believed that some level of understanding, at least among the State-level agencies, existed in the two years since issuing new approvals had been suspended. There had been no new requests from State-level agencies in the previous seven years. Only one new request had come from a local agency in 2014. At that time, FHWA informed that agency that further approvals would not be granted pending a decision on the long-term status of Clearview. In addition, FHWA reported at one or more of the semi-annual meetings of the NCUTCD and the annual meeting of the American Association of State Highway and Transportation Officials’ Subcommittee on Traffic Engineering that the long-term status was being evaluated and a decision would be forthcoming. All States, as well many of the professionals involved in sign design and manufacture, are represented on one or both committees. Some of these actions are noted in the timeline provided in Table 2.3.

The termination of the Interim Approval for Clearview has been characterized as “abrupt,” initially by one State department of transportation in its correspondence to FHWA. This characterization then proliferated in proposed legislation and news media when the correspondence was shared concurrently with other sources. However, the possibility of termination was evident through the following:

- Suspension of further Interim Approvals, the possibility of rescission, and the reasons were publicized in news media

- Additional design guidance that stated the limitations of the applicability of Clearview, and clarified the efficacy of the Standard Alphabets, had been made available at the MUTCD Web site in which Clearview was characterized as “neither required nor recommended”
- One of the States that had later objected to the termination as having had no notice was informed of this possibility via teleconference that the State agency had initiated
- FHWA directly addressed the potential change in status of Clearview at meetings of two organizations on which most, if not all States are represented, as well as others in the transportation profession and practice

The FHWA also published an advance notice of the termination in the Federal Register in an effort to be transparent and reach the broadest possible audience. The purpose was to be clear to agencies what the reasons were for the termination and how the termination was expected to be implemented, offering agencies as much discretion as possible.

7.3 Issuing and terminating Interim Approvals

The process by which Interim Approvals are issued has evolved over the fifteen years that the Interim Approval provision has existed in the MUTCD. Normally, new Interim Approvals are issued through a memorandum to the FHWA’s Federal-aid division offices, which then communicate that information to the States. This part of the process has not changed. However, in the time since this Interim Approval was issued, FHWA has learned that there is a high expectation, almost a perception of a guarantee, by State and local agencies that the provisional devices will be adopted in the next MUTCD. Unfortunately, the Interim Approval process, while designed to accelerate innovation, also provides the opportunity to gain additional experience with the provisional device. While many Interim Approvals were eventually adopted in the MUTCD, the provisions were revised, refined, and even limited based on the experience gained during the period of interim use. In essence, Interim Approvals, to some extent, serve as another level of experimentation but with much less control than an official experiment²⁷ would involve. This evolution is not very different from the way that the provisions for a particular device might change from one edition of the MUTCD to the next: additional practical experience is gained with a successfully tested concept by having it deployed in practice. The purpose of updating the MUTCD on a periodic basis is to address not only new items, but also existing concepts that have demonstrable effects on traffic safety and operation. These effects might be positive or negative. Interim Approvals have been and will continue to be evaluated as a result of this experience to ensure that future Interim Approvals have the rigorous data needed to support inclusion in the MUTCD. Potential future procedures include minimum general thresholds and an appropriate level of analysis of the available data. These procedures had already evolved and been instituted since IA-5 was issued.

At the time of the termination of IA-5, no Interim Approval had been rescinded. Therefore, FHWA had no experience with taking such an action. Interim Approvals are not published in the Federal Register. Rather, new Interim Approvals are issued through official memorandum that is then distributed through the Federal-aid Highway division offices and made available to the public-at-large on the MUTCD Web site. A similar approach was taken with the first rescission of an Interim Approval. Because it involved a termination, the additional step of publication of an advance notice in the Federal Register was taken so it could more broadly reach those affected. As the notice was advance notification of a decision based on the twenty or more years of independent research efforts that had failed to accomplish its initial goal of “replacing the 40-year-old guide sign font with a new font called Clearview,” did not involve a rulemaking action, did not require replacement of existing infrastructure, and was at least cost-neutral, FHWA did not solicit public comment.

²⁷ Procedures for Official Experimentation are found in MUTCD § 1A.10.

7.4 Impact of allowing alternative fonts

There is no question that the presence and availability of two fonts with differing criteria have resulted in significant confusion among transportation professionals. The termination streamlined the design and specification processes by removing this complexity and confusion with this alternative that was not able to be resolved through issuing guidance as FHWA had done for several years. The termination reduced the burden on the Federal government by minimizing the extensive technical support, in the form of responses to public inquiries from State and local jurisdictions, required to sustain two standards. As indicated by several comments to the RFI, similar burdens on the States and others were reduced by minimizing the additional associated technical support to staff and local jurisdictions.

The MUTCD currently allows the use of fonts other than that Standard Alphabets under limited conditions. This flexibility is limited to Community Wayfinding signs found in urbanized locations that direct travelers to local points of interest that are not major destinations. Rather, the destinations listed are key civic and public institutions within the localized area. Each community's designs differ and are unique, but are contained to some extent by the MUTCD provisions that address contrast ratio between legend and background colors, size, and amount of legend. Further, their placement is also limited such that they do not obstruct or interfere with other higher-priority traffic control devices. These signs cannot replace standard guide or other types of signs, but can be used in addition to those in order to direct travelers to sites for which signs are not normally provided.

7.5 Future research on fonts

Any future research that examines alternative sign fonts should compare all letter styles studied using the same general proportion and letter heights, as well as intercharacter and line spacing to control variables and ensure true comparability in results. A predetermined objective of completely replacing an existing standard, as was most often the case with Clearview research, should be avoided to maintain objectivity in the results. By keeping the objective to improving legibility or other viewing factors independent of font should ensure objective results that can appropriately inform future direction on improving the effectiveness of traffic control devices. The impact of establishing and maintaining separate standards for each alternative font, and their impact on consistency in sign design and appearance, should also be major factors.

Appendix

Appendix A. Correspondence regarding status of Interim Approval

FHWA to Grays Harbor County, Washington, April 17, 2014



U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

APR 17 2014

In Reply Refer to:
HOTO-1

Ronald H. Merila, P.E.
Deputy Director, Traffic and Planning
100 West Broadway, Suite 31
Montesano, WA 98563

Dear Mr. Merila:

Thank you for your March 5 resubmittal of your request for Interim Approval to use the Clearview alternative letter style on highway signs. At this time, the FHWA is not considering requests for expansion of the use of an alternative to the FHWA Standard Alphabets.

Based on more recent evaluations and in-service performance, it appears that the critical factor in nighttime visibility and legibility is the combination of retroreflective sheeting used for the sign background and legend. Further, the narrower series of the alternative alphabets were not developed for and are not recommended for or conducive to conventional roadway signing, particularly Street Name signs. Based on these and other reasons, we expect to rescind the Interim Approval in the near future.

This action does not restrict use of an alternative letter style on Community Wayfinding signs as provided in Paragraph 31 of Section 2D.50 of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD).

We regret that we cannot approve your request. For recordkeeping purposes, we have assigned your request the following number and title: "IA-5.31 – Clearview—Grays Harbor County, WA (DENIED)." Please contact Mr. Kevin Sylvester of my staff at Kevin.Sylvester@dot.gov if you should have further questions on this matter.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "Mark R. Kehrli".

Mark R. Kehrli
Director, Office of Transportation
Operations

ATSSA to FHWA, July 26, 2015

Roger A. Wentz, CAE
President & CEO
rag@atssa.com



July 26, 2015

Mr. Gregory G. Nadeau, Administrator
U.S. Department of Transportation
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Dear Administrator Nadeau:

I write on behalf of the Sign Committee of the American Traffic Safety Services Association to request clarification on the continued use of Clearview Font for positive contrast signs and research into its use on negative contrast signs.

Clearview Font has been in Interim Approval since 2004. The Interim Approval only allows the use of Clearview Font as an alternative to the Standard Alphabet on positive-contrast (white legend on a green, blue, or brown background) guide signs, as this contrast orientation is the only one that has demonstrated an improvement in legibility distance to date for those legends composed of upper and lower case letters when using specific series of Clearview Font lettering. According to a report by the Texas Transportation Institute, the use of Clearview Font in negative-contrast color orientations, such as on regulatory and warning signs, has been shown to decrease legibility distance when compared with the FHWA Standard Alphabet series font.

While the FHWA FAQ (<http://muted.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm#q1>) section is a good source of information and reference point for agencies, our members who fabricate signs indicate that significant confusion still remains in the marketplace.

A denial of a request by Grays Harbor for use of the Clearview Font leads us to believe that there is a change in the Interim Approval status. The FHWA memo to Grays Harbor States in part:

Based on more recent evaluations and in-service performance, it appears that the critical factor in nighttime visibility and legibility is the combination of retroreflective sheeting used for the sign background and legend. Further, the narrower series of the alternative alphabets were not developed for and are not recommended for or conducive to conventional roadway signing, particularly Street Name signs. Based on these and other reasons, we expect to rescind the Interim Approval in the near future.

With what appears to be further delay in the planned Notice of Proposed Amendment to the Manual on Uniform Traffic Control Devices, the ATSSA Sign Committee believes that it is unwise to wait until that NPA is issued to make a "permanent" decision on the use of Clearview Font as that would only exacerbate the current confusion in the marketplace. We urge FHWA to make a prompt decision on the permanent status of the Clearview Font.

Very truly yours,

Roger A. Wentz

A M E R I C A N T R A F F I C S A F E T Y S E R V I C E S A S S O C I A T I O N

14 RIVERSIDE PARKWAY ■ SUITE 100 ■ BRIDLERIDGE, VA 22466-1000
TEL: (404) 368-7011 ■ FAX: (404) 368-1177 ■ TOLL FREE: (800) 272-8771 ■ INTERNET: www.atssa.com
TRAINING: (478) 441-9687

FHWA-150730-004

FHWA to ATSSA, September 16, 2015



Office of the Administrator

1200 New Jersey Ave., SE
Washington, D.C. 20590

September 16, 2015

In Reply Refer to:
HOTO

Mr. Roger A. Wentz
President and CEO
American Traffic Safety Services
Association
15 Riverside Parkway, Suite 100
Fredericksburg, VA 22406

Dear Mr. Wentz:

Thank you for your letter regarding lettering for highway signs. Specifically, you requested clarification on the status of the Clearview™ lettering style and expressed concern over confusion that has resulted in the marketplace.

The Clearview lettering style is currently subject to provisional use in accordance with the terms of the Federal Highway Administration's (FHWA) Interim Approval under the Manual on Uniform Traffic Control Devices for Streets and Highways. The additional guidance available at the FHWA's MUTCD Web page is intended to provide clarification based on research evaluations that have occurred since the Interim Approval was issued in 2004.

I understand your concern over the confusion that has resulted from the limited applicability of the Interim Approval. We are aware of these and other concerns related to the alternative lettering style. We have reviewed the history of past research evaluations that examined the legibility of narrower letter forms and other contrast orientations of the provisional letter style. Based on this information and other considerations, we intend to issue formal guidance on this topic in the coming weeks.

We appreciate your interest in traffic control devices and dedication to uniformity in sign design.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gregory G. Nadeau".

Gregory G. Nadeau
Administrator

Appendix B. News media regarding status of Interim Approval

[Home](#) > [Harbor News](#) > Clearview highway font not clear enough for Grays Harbor

Clearview highway font not clear enough for Grays Harbor

April 30, 2014 [KXRO Newsradio](#)

New signs on local highways may have a new look, but not one that you may notice.

In a recent request by Grays Harbor County, the Federal Highway Administration said that they will no longer be using Clearview as the font for new highway signs. The font style, used by cities across the country as well as the Department of Transportation, will no longer be allowed on any signs.

It is not the official font recommended for use by the FHWA, and states were required to request interim approval from the Federal Highway Administration to use it in their signage.

Neil Gaffney, Public Affairs Specialist for the Federal Highway Administration tells KXRO, "We plan on rescinding the interim approval altogether and are not approving further use of the font anywhere going forward."

The font was the only federally approved alternative to the existing FHWA Standard Alphabets, intended to provide a more visible look for signs. In use since 2004, Testing found that Clearview was 2 to 8% more legible in daytime and nighttime viewing than the Highway Gothic font style that was the standard on overhead signs, particularly benefiting older drivers, with a 6% increase in legibility distance.

Gaffney said that the FHWA has provided interim approvals for Clearview, thinking that it would be an improvement over the standard fonts, but that the narrower alphabet did not provide enough benefits, and that the critical factor nighttime visibility and legibility was mostly based on retroreflective sheeting, not the font.

"We're working with Grays Harbor County to help them provide appropriate signs based on the Manual on Uniform Traffic Control Devices (MUTCD), which sets minimum standards and provides guidance on road signs to reduce accidents and improve mobility on roads."

According to Aberdeen Public Works Director Malcolm Bowie, the city only uses the FHWA Standard Alphabet and not Clearview.

The font is still used elsewhere, and was adopted as the standard typeface for signs in the province of British Columbia in 2006. Numerous other fonts are approved for use throughout the state for signage, such as Parks.

Design and Use Policy for Clearview Alphabet

Frequently Asked Questions — Design Criteria for the Use of Alternative Alphabets Subject to Interim Approval

Introduction

A number of questions have been asked with regard to the [Interim Approval dated September 2, 2004 for the alternative highway sign letter style, Clearview™](#). The use of this alternative lettering style is completely optional and is neither required nor recommended. The FHWA has prepared the following information to assist agencies, sign designers, and sign fabricators in understanding the application and design parameters to be consistent with the Interim Approval if an agency has chosen, and received FHWA approval, to use the alternative alphabets. Additional information regarding the use of traffic control devices under an Interim Approval can be found in the [Section 1A.10](#) of the MUTCD.

Frequently Asked Questions

1. [Does FHWA now require Clearview in place of the Standard Alphabets?](#)
2. [I read in a newspaper article that Clearview lettering is significantly better than the old highway lettering we use on our signs. Should we use Clearview alphabets on all our signs?](#)
3. [If my agency has adopted Clearview, should I revise all the standard positive-contrast signs to use Clearview as well?](#)
4. [Under what conditions can I expect to see a benefit from using Clearview?](#)
5. [How was the legibility improvement achieved?](#)
6. [Does this mean I should no longer use Series E-modified on signs?](#)
7. [When designing signs with Clearview, do I use the letter height criteria from the MUTCD in the same way as the Standard Alphabets?](#)
8. [If I reduce the letter height, can I still use Clearview as long as it provides the same legibility as the Standard Alphabets?](#)
9. [Does this mean I can still get better legibility by using Clearview even with a letter height smaller than the Standard Alphabets?](#)
10. [Since Clearview is so much more legible than the old highway lettering, and it was based on using upper- and lower-case letters, should I now display all lettering on signs using upper- and lower-case letters as I've seen illustrated in some documents?](#)
11. [Does this mean all letters, numerals, and characters of Clearview are significantly more legible?](#)

12. [I've seen fractions displayed in many different ways and my software does not allow me to display fractions as described in the MUTCD. Should I just use what the software produces?](#)
 13. [Should I use the same interline spacing that I used with the Standard Alphabets?](#)
 14. [Can I replace my existing signs that use E-modified with any type of the Clearview lettering?](#)
 15. [My agency has adopted Clearview for all its destination legends on signs and we plan to specify 5-W-R instead of 5-W for all signs. Is this acceptable?](#)
 16. [We've replaced some of our very old guide signs with new ones using Clearview and have received positive feedback that the new signs look better. How else should I monitor the effectiveness of the new signs?](#)
 17. [Does FHWA plan to discard the Standard Alphabets and replace them with the alternative alphabets?](#)
 18. [I heard on my morning news program that I have to change my Street Name signs to use upper- and lower-case letters \(instead of all upper-case\) and that this was called Clearview. Is this statement accurate?](#)
 19. [Should I also be considering Clearview for non-freeway guide signs, such as Street Name signs and Destination signs on conventional roads?](#)
 20. [I recently read in a nationally endorsed compendium of treatments for non-motorized vehicles that Clearview should be used on guide signs for bicycle facilities because "it is commonly used for guide signs in the United States." Is this recommendation accurate?](#)
-

Questions and Answers

1. Q: Does FHWA now require Clearview in place of the Standard Alphabets?

A: There is neither a requirement nor recommendation for any agency to use an alternative letter style. The use of this alternative letter style is subject to Interim Approval and an agency must first request and be granted permission by FHWA to use it.

2. Q: I read in a newspaper article that Clearview lettering is significantly better than the old highway lettering we use on our signs. Should we use Clearview alphabets on all our signs?

A: The use of Clearview as an alternative to the Standard Alphabets is allowed only on positive-contrast (white legend on a green, blue, or brown background) guide signs, as this contrast orientation is the only one that has demonstrated an improvement in legibility distance to date for those legends composed of upper- and lower-case letters when using specific series of Clearview lettering. The use of Clearview in negative-contrast color orientations, such as on regulatory and warning signs, has been shown to decrease legibility distance when compared with the FHWA Standard Alphabet series.



Figure 1a. NOT ACCEPTABLE: Improper uses of Clearview in negative-contrast orientation, improper uses of upper- and lower-case lettering.



Figure 1b. NOT ACCEPTABLE: Improper uses of Clearview in negative-contrast orientation.

3. Q: If my agency has adopted Clearview, should I revise all the standard positive-contrast signs to use Clearview as well?

A: No. Standard signs (except those with variable destination legends displayed in upper- and lower-case letters) shall retain their distinct designs using the FHWA Standard Alphabets and shall not be redesigned to employ an alternative alphabet, regardless of contrast orientation. The narrower series of Clearview that would typically be used for standard sign legends did not provide for longer legibility distances. For example, 3-W was found to be less legible than the comparable Series D of the Standard Alphabets. Route signs shall continue to use the FHWA Standard Alphabets for numerals and letters.



Figure 2. NOT ACCEPTABLE: Examples of improper use of Clearview numerals in route signs.

4. Q: Under what conditions can I expect to see a benefit from using Clearview?

A: The greatest improvement in legibility distance afforded by Clearview was realized by older drivers with poor vision (worse than 20/40 visual acuity) when mixed-case legends (those composed of an initial upper-case letter followed by lower-case letters) were viewed under vehicle headlamp illumination during nighttime conditions (an increase in legibility distance of approximately 5 percent for signs that are not otherwise illuminated). A like improvement was not demonstrated for other types of legends that use all upper-case lettering, such as action or distance messages or those found on standard signs.

5. Q: How was the legibility improvement achieved?

A: The percentage improvement in legibility distance indicated by the studies referenced in the Interim Approval is based on the cumulative effect of a change in two variables: (1) the mixed-case alphabet (Clearview 5-W in place of Series E-modified) and (2) the retroreflective sheeting (Microprismatic in place of Encapsulated Lens). The aggregate improvement is the result of the combination of the two changes.

6. Q: Does this mean I should no longer use Series E-modified on signs?

A: The use of Standard Alphabet Series E-modified with Microprismatic retroreflective sheeting also produced an improvement in legibility over use of the same with Encapsulated Lens sheeting. A 6.3-percent increase in legibility can be achieved simply by changing from

encapsulated lens sheeting to microprismatic retroreflective sheeting.

7. **Q: When designing signs with Clearview, do I use the letter height criteria from the MUTCD in the same way as the Standard Alphabets?**

A: No. It is important to understand that the way in which the legibility of the alternative letter style is enhanced is by increasing the letter height—specifically, the height of the lower-case letters. Letter heights for Clearview shall be determined by the specified upper-case letter height according to the MUTCD as usual. However, **the lower-case loop height shall be 84% of the corresponding upper-case letter height** (instead of 75% as specified for the Standard Alphabets; see MUTCD Section 2A.13 for definition of loop height). For example, a specified upper-case letter height of 16 inches would have a corresponding lower-case loop height of 13.44 inches for the alternative letter style. (By contrast, the Standard Alphabet lower-case loop height would be 12 inches for a 16-inch initial upper-case letter.)

The convention specified for the Standard Alphabets **shall not be applied** to the alternative alphabet for the determination of the lower-case loop height. The evaluations that demonstrated the above-stated legibility enhancement were predicated on an enlargement of the lower-case loop height. Using a proportion less than 84%, therefore, cannot justify a deviation from the FHWA Standard Alphabets.

8. **Q: If I reduce the letter height, can I still use Clearview as long as it provides the same legibility as the Standard Alphabets?**

A: No. The intent of an Interim Approval is to provide for an improvement over the current provisions of the MUTCD until such time that it is found appropriate to amend the MUTCD. An Interim Approval is not intended to provide an equivalent alternative for provisions that already exist in the MUTCD. Changes to the MUTCD are made to improve traffic control devices, not to offer equivalent alternatives.



Figure 3. NOT ACCEPTABLE: Incorrect proportion of lower-case loop height (undersized) to initial upper-case letter height.

9. **Q: Does this mean I can still get better legibility by using Clearview even with a letter height smaller than the Standard Alphabets?**

A: The incremental legibility gain from Clearview was achieved only by making the letters larger than a comparable Standard Alphabet series, specifically by enlarging them by 12 percent.

10. **Q: Since Clearview is so much more legible than the old highway lettering, and it was based on using upper- and lower-case letters, should I now display all lettering on signs using upper- and lower-case letters as I've seen illustrated in some documents?**

A: Mixed-case legends are restricted to place names and destinations; all other messages such as action and distance messages, cardinal directions, and auxiliary designations shall remain composed of all upper-case letters employing the the MUTCD criteria. Legends composed of all upper-case letters did not demonstrate a like improvement over the Standard Alphabets when displayed using Clearview. Accordingly, words composed of all upper-case letters continue to use the Standard Alphabets.

11. **Q: Does this mean all letters, numerals, and characters of Clearview are significantly more legible?**

A: Numerals and special characters have not been tested for legibility and concerns have been reported thereon in field applications. Therefore, numerals continue to be displayed on highway signs using the Standard Alphabets.



Figure 4. ACCEPTABLE: Example of appropriate use of Clearview for destination legend (mixed-case) and FHWA Standard Alphabets for other legends (all upper-case and numerals).

12. **Q: I've seen fractions displayed in many different ways and my software does not allow me to display fractions as described in the MUTCD. Should I just use what the software produces?**

A: Fractional distances shall use the standard display format of one-and-one-half times the

height of the numerals within the fraction. The height of the numerals within the fraction shall be the same as the height of the letters in the distance units (e.g., MILE, FEET). The numerator and denominator of the fraction shall be diagonally arranged about the solidus. If the sign design or fabrication software does not produce a layout that conforms to the provisions of the MUTCD, then that function might need to be manually overridden to achieve a correct arrangement of the legend elements.



Figure 5a. NOT ACCEPTABLE: Incorrect alignment of fraction numerals and inadequate interline and edge spacing.



Figure 5b. ACCEPTABLE: Correct alignment of fraction numerals.

13. Q: Should I use the same interline spacing that I used with the Standard Alphabets?

A: Interline spacing is determined by the letter height within the lines of legend. For the Standard Alphabets, the MUTCD recommends 75% of the upper-case letter height, which corresponds to 100% of the lower-case loop height. The ascending strokes of the Standard Alphabet lower-case letters extend to the same height as the initial upper-case letter. However, the same is not true for the alternative alphabet. Because the lower-case loop height is a larger proportion of the upper-case letter height, so, too, are the heights of the ascending strokes of the lower-case letters. Therefore, for the alternative alphabets, the recommended space between lines of legend is equivalent to the lower-case loop height, or 84% of the initial upper-case letter height, to avoid a crowded appearance that can inhibit legibility and orderly processing of a sign legend by the observer.



Figure 6. NOT ACCEPTABLE: Examples of inadequate interline and edge spacing.

14. Q: Can I replace my existing signs that use E-modified with any type of the Clearview lettering?

A: When instituting a system of freeway and expressway guide signs using Clearview, the standard character spacing (5-W) is used for the majority of the signs along the system. Clearview 5-W-R provides for reduced letter spacing only in those limited situations where an existing sign support structure does not have the design capacity to accommodate the increase in sign area necessitated by the use of Clearview 5-W with its standard letter spacing.

15. Q: My agency has adopted Clearview for all its destination legends on signs and we plan to specify 5-W-R instead of 5-W for all signs. Is this acceptable?

A: No. The legibility of Clearview 5-W-R was found to be comparable to that of Series E-modified and, therefore, does not support the basis for the Interim Approval or an agency standard because it is not an improvement over the current standard. Clearview 5-W-R is restricted only to those situations where a new sign is installed on an existing sign support structure that does not have additional design capacity to accommodate a larger sign.

16. Q: We've replaced some of our very old guide signs with new ones using Clearview and have received positive feedback that the new signs look better. How else should I monitor the effectiveness of the new signs?

A: To evaluate the effectiveness of signs that employ Clearview, it is recommended that a control corridor be established to evaluate whether any perceived improvement is the result of a change in the letter style, retroreflective sheeting, or a combination thereof.

17. Q: Does FHWA plan to discard the Standard Alphabets and replace them with the alternative alphabets?

A: FHWA has no plans at this time to discontinue specifying the Standard Alphabets. The use of Clearview, therefore, is still subject to Interim Approval.

18. Q: I heard on my morning news program that I have to change my Street Name signs to use upper- and lower-case letters (instead of all upper-case) and that this was called Clearview. Is this statement accurate?

A: No. The requirement for the use of mixed-case legends in the 2009 MUTCD does not necessitate the use of another letter style in place of the FHWA Standard Alphabets, which have lower-case alphabets for all letter series.

Further, there has never been a requirement to change an existing sign for the sole purpose of displaying its legend using upper- and lower-case letters instead of all upper-case. Instead, the requirement to display destinations and roadway names in upper- and lower-case letters is met when existing signs are replaced for other reasons, such as serviceability.

19. Q: Should I also be considering Clearview for non-freeway guide signs, such as Street Name signs and Destination signs on conventional roads?

A: The narrower series of Clearview that would typically be used on conventional road signs—those other than 5-W and 5-W-R—have generally not been evaluated for legibility. Therefore, the Standard Alphabets continue to be used on these signs. (Clearview 3-W has been evaluated and has been found to be less legible than the comparable Standard Alphabet Series D).

20. Q: I recently read in a nationally endorsed compendium of treatments for non-motorized vehicles that Clearview should be used on guide signs for bicycle facilities because "it is commonly used for guide signs in the United States." Is this recommendation accurate?

A: The statement is not accurate and the recommendation is unfounded. The greatest benefit attained from the use of Clearview was for older drivers when signs were viewed under motorized vehicle headlamp illumination using the 5-W alphabet. By contrast, Clearview did not produce longer legibility distances than the Standard Alphabets under daytime viewing conditions. Because bicycle headlamps do not emit a level of irradiance or intensity that is similar to that of motorized vehicles, their incidence on sign retroreflectivity does not result in nighttime viewing effects comparable to those of highway-speed environments. Accordingly, the Standard Alphabets are used on all signs for bicyclists.

Appendix D. FHWA Technical Brief, January 2016

TECHNICAL BRIEF

Federal Highway Administration

Manual on Uniform Traffic Control Devices for Streets and Highways: Termination of Interim Approval No. 5, Clearview Font for Positive Contrast Legends on Guide Signs

Introduction: On January 25, 2016, the FHWA published a notice in the Federal Register¹ terminating the use of an alternative letter style, Clearview™, on traffic control devices. The use of this alternative letter style was authorized under the provisions of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) for Interim Approval. Agencies wishing to use the alternative letter style were required to request approval from FHWA. The alternative letter style has not been adopted in the MUTCD.

Research History and Implementation: Initial studies evaluated only one letter form type of the provisional letter style with two different intercharacter spacing criteria. These are now known as 5-W and 5-W-R, the latter of which has a compressed intercharacter spacing so that the length of a word would approximate that of the same word composed of the FHWA Standard Alphabet Series E(modified). This compressed version was found to provide no improvement over Series E(modified). These studies did not evaluate numerals for legibility or recognition. The narrower letter forms of the provisional letter style (designated as 1-W, 2-W, 3-W, and 4-W) were also not evaluated for legibility in these studies.

The study² on which the Interim Approval was primarily based found that changing the type of retroreflective sheeting alone resulted in a 6% improvement in legibility to the FHWA Standard Alphabet Series E(modified). However, this quantitative result was not otherwise reported as a major finding. The practical difference attributed to the letter style was characterized as “modest” and the apparent improvement of the provisional letter style could be “partly attributed to [its] increased size.” Because of the narrowly focused research statement, which examined the cumulative effect of a change to two variables, the study recommended that the sponsoring agency adopt a new standard to change both the retroreflective sheeting to microprismatic and the letter style to 5-W³. The fact that the sponsoring agency already owned 100 licenses of the design and fabrication software for the provisional letter style and had furnished one licensed copy to a sign fabricator was also noted in the recommendation.

Subsequent testing^{4,5} showed that FHWA Standard Alphabet Series D resulted in longer legibility distances than the 3-W letter style of the alternative alphabet.

¹ *Federal Register*, Vol. 81, No. 15. 81 FR 4083. National Archives and Records Administration, January 25, 2016.

² Carlson, P. J. *Evaluation of Clearview Alphabet with Microprismatic Retroreflective Sheetings*, Report No. FHWA/TX-02/4049-1. Texas Transportation Institute, August 2001, resubmitted October 2001.

³ The sponsoring State agency adopted this recommendation, but substituted 5-W-R for 5-W as its standard.

⁴ Chrysler, S. T., P. J. Carlson, and H. G. Hawkins. *Nighttime Legibility of Ground-Mounted Traffic Signs as a Function of Font, Color, and Retroreflective Sheeting Type*, Report No. FHWA/TX-03/1796-2. Texas Transportation Institute, September 2002.

⁵ Holick, A. and P. J. Carlson. *Nighttime Sign Legibility as a Function of Various Combinations of Retroreflective Sheeting and Font*, Report No. FHWA/TX-04/1796-4. Texas Transportation Institute, September 2003.

Legibility and recognition deficiencies with numerals of the provisional style were reported in a field experiment as early as 2009. A formal evaluation⁶ later confirmed that the numerals of the Standard Alphabets exhibited superior performance when compared with those of the provisional lettering style.

A 2014 study⁷ found that there is no practical difference between Series E(modified) of the Standard Alphabets and 5-W of the provisional letter style when tested in positive-contrast color orientations.

Explorations of the provisional letter style in negative-contrast color orientations⁸ revealed that the provisional letter style actually reduced the nighttime legibility when compared with the Standard Alphabets.

Recognition vs. Pure Legibility

Research has focused primarily on the legibility of one letter style compared to another. One of the studies acknowledged the fact that the excessively long legibility distances reported in some of the earlier work were actually the result of recognition, rather than legibility, due to learning effects by the participants among the set of test words. These research evaluations did not necessarily simulate the actual process of reading a sign: detection, recognition, and reaction via multiple glances. While legibility alone might be considered a valid surrogate measure for the entire process of interpreting a highway sign, marginally differing results do not necessarily indicate a practical significance that can justify an institutional or systematic change.

Degradation of Consistency in Signing Layouts

The presence and availability of two separate letter styles with differing criteria have resulted in significant confusion and inconsistency in the highway sign design and fabrication processes. Although the terms of the FHWA's 2004 Interim Approval are explicit, misunderstandings and misapplications of the provisional letter style have resulted. In 2011, the FHWA issued a *Design and Use Policy*⁹ on this topic that included explicit criteria in question-answer format with photographic examples to illustrate acceptable and unacceptable practices. This additional guidance has failed to allay these practices. The following are representative examples of ways in which these concerns have manifested themselves:

- **Sign Design.** Poor sign design practices are becoming unduly institutionalized. This phenomenon appears to have coincided with the provisional allowance of an alternative lettering style due to a lack of consistent implementation and inaccurate presumptions

⁶ Miles, J., B. Kotwal, S. Hammond, and F. Ye. *Evaluation of Guide Sign Fonts*, Report No. MN/RC 2014-11. Texas A&M Transportation Institute, February 2014.

⁷ Ibid.

⁸ Holick, A., S. T. Chrysler, E. Park, and P. J. Carlson. *Evaluation of the Clearview™ Font for Negative Contrast Traffic Signs*, Report No. FHWA/TX-06/0-4984-1. Texas Transportation Institute, January 2006, resubmitted April 2006.

⁹ <http://mutcd.fhwa.dot.gov/resources/clearviewdesignfaqs/index.htm>

that lesser sign design criteria, such as reduced interline and edge spacing, are broadly acceptable.

- Incorrect Applications of the Provisional Letter Style. Many agencies erroneously believed that the alternative lettering style should be used in all applications and that all lettering should be displayed in upper- and lower-case lettering, regardless of the type of message. While there is evidence of this phenomenon occurring at State levels, these misunderstandings have metastasized at the local levels, in part, due to inaccurate or incomplete reports published in news media and trade journals, and promotional efforts of commercial entities, including some associated with the early development of the provisional letter style. There is also considerable confusion that the requirement of the MUTCD to display destination and street names in upper- and lower-case lettering equates to the use of the provisional lettering style rather than the Standard Alphabets. In actuality, there is no interdependency between letter style and case.
- Negative-Contrast Applications of the Provisional Letter Style. Commercial availability and promotion of the alternative letter style for negative-contrast color orientations—which was not part of the Interim Approval—have also resulted in confusion among agencies and sign manufacturers. Regulatory and warning signs, including some as basic as the standard Speed Limit sign, have been observed using the alternative lettering style that has not been approved for use due to its inferiority to the Standard Alphabets in negative-contrast color orientations¹⁰.

Conclusions of Research Evaluations

A significant number of research studies have been performed in pursuit of an alternative letter style. However, inconsistent or counterintuitive conclusions have been drawn from the results as reported to support or promote use and/or further study of an alternative letter style. The following examples illustrate this concern:

- Sign Size. The impetus reported for pursuing an alternative letter style was to avoid the need for larger lettering, thereby avoiding larger sized signs. With the standard spacing of 5-W lettering, the word lengths are typically longer than with Series E(modified), resulting in a larger sign.
- Increase in Letter Height to Accommodate an Alternative Letter Style. A 2003 study¹¹ concluded that 3-W lettering of the provisional style in a larger letter height produces longer legibility distances than Series D in a smaller letter height. The researchers recommended that 8-inch 3-W lettering be used to replace all signs that used 6-inch Series D lettering. While increases in letter heights in this range can result in increased legibility distances independent of letter style, they will also result in larger signs, including with this scenario. The additional costs associated with larger sign sizes appear not to have been considered in making this recommendation. The recommendation to increase the letter height by 2 inches in order to justify the use of the alternative letter style on conventional roadways contravenes the original premise of considering an alternative letter style: improve legibility without costly increases in sign sizes. Following such a recommendation would result in an 80% increase in the

¹⁰ Holick et al. *Evaluation of the Clearview™ Font for Negative Contrast Traffic Signs.*

¹¹ Holick and Carlson. *Nighttime Sign Legibility.*

area for a typical one-line Destination sign. The increase in area for a three-line Destination sign typically used at conventional road junctions would be 95%.

- Compressed Intercharacter Spacing. To mitigate the issue of larger signs, which would often necessitate replacement of the supporting structure, compressed intercharacter spacing criteria were developed for the provisional 5-W letter forms, referred to as 5-W-R. The use of 5-W-R is restricted to retrofits where an existing sign support structure that is still in serviceable condition does not have the capacity to accommodate a larger sign. It was expected that these cases would be relatively rare. However, some agencies have specified the compressed intercharacter spacing of 5-W-R as their default standard for all new signs, including those installed on new support structures, resulting in no net improvement over the Standard Alphabets that these signs replaced.
- Comprehensive vs. Incremental Analysis of Results. While the most recent study suggested that there is no practical advantage to using the alternative lettering style over the Standard Alphabets because of the lack of consistent improvement in the legibility index, it questioned whether it is possible to achieve additional improvements in legibility. Instead, the researchers recommended that any future research on letter style focus on improvements that would reduce the cost of signs without affecting their safety performance. This recommendation did not consider the inconsistencies that have arisen due to the presence of two different lettering styles and criteria.
- Specific Focus of Research Evaluations. Early research made iterative revisions to letter forms, size, and spacing of an alternative letter style until what appeared to be a statistically significant improvement resulted, but only for the alternative letter forms. Development of an alternative letter style eventually became self-propagating, excluding any consideration of optimizing the established Standard Alphabet letter forms and other criteria such as stroke width, loop height, or intercharacter spacing. This process unnecessarily presumed a fundamental dysfunction with the existing practice that could not be rectified. One study¹² in which “no conclusion can be drawn about the relative legibility” based its recommendation for letter style on a different study rather than the one conducted.
- Interline Spacing. The closed-course research evaluations did not use signs with multiple lines of legend that would simulate actual highway signing. Because the interline spacing is customarily based on the initial upper-case letter height, and the lower-case loop and rising stem heights of the provisional style are larger than those of the Standard Alphabets, the resulting space between lines of legend is reduced. The effect of this apparent reduced interline spacing was not measured. Reports of signs whose legends appear crowded are likely attributable to this effect.
- In-Service Performance and Comparison. A recent field evaluation¹³ observed no statistically significant difference between new signs that used the provisional 5-W lettering and a combination of new and existing signs that used Series E(modified).

¹² Smiley, A., C. Courage, T. Smahel, G. Fitch, and M. Currie. *Required Letter Height for Street Name Signs: An On-Road Study*, Paper No. 01-2225. Human Factors North and Toronto Transportation, 2001.

¹³ Mahmassani, H. S., C. W. Frei, and M. Saberi. *Clearview™ Font in Illinois: Assessing IDOT Experiences and Needs*, Report No. FHWA-ICT-13-003. Northwestern University Transportation Center, January 2013.

The recommendation of this study was to continue using Clearview for positive-contrast signs based on the fact that it had been implemented and there was no difference or negative reaction reported. Though, there appeared to be no consideration of the need to continue to use the Standard Alphabets in the majority of signing applications. This evaluation concluded that retroreflective sheeting materials might affect legibility, regardless of the letter style, corroborating past evidence. Additionally, it was reported in this evaluation that the intercharacter spacing of Clearview was often “manually adjusted” to avoid increasing the size of signs.

- **Practical Significance.** The 2014 study¹⁴ evaluated a modification of the Standard Alphabets, using larger lower-case letters and a lesser stroke width based on Series E(modified). Based on a comparison between the comparable alternative alphabets and the Standard Alphabets, there was no statistically significant difference in the legibility and/or recognition that could justify further exploration of any one of the letter styles over another. Further, legibility and recognition of numerals of the alternative alphabet were found to be inferior to those of the Standard Alphabets.

Implementation

Interestingly, a number of agencies are now using 20-inch leading upper-case letters with either 5-W or 5-W-R of the provisional lettering style. However, there is not necessarily a proportional increase in legibility or recognition with increases in letter height^{15, 16}. The basic premise of the development of an alternative letter style was to address a generalized hypothesis¹⁷ that letter heights of 20 inches would be needed to address the needs of older drivers, partly due to irradiation that can occur with different combinations of high-brightness retroreflective materials. This conclusion was extrapolated from a laboratory simulation and came during the infancy of higher-brightness retroreflective background sheeting on highway guide signs. It was intended to address a more practical visual acuity that would represent a broader cross-section of drivers and was at best, an approximation, as the actual Standard Alphabets were not used in this simulation. The research on an alternative lettering style was promoted largely as a means to avoid unnecessarily enlarging signs to meet this recommendation (cited in various articles as anywhere between a 20% increase to as much as a 33% increase), thereby sparing transportation agencies those additional costs while gaining the benefit of improved effectiveness. The presumption was that letter forms completely different from those of the Standard Alphabets would be the solution and did not examine modification to or optimization of the established Standard Alphabet letter forms. In fact, even the early research¹⁸ had determined that it was the relative contrast of the level of retroreflectivity used for the legend and background that was the critical factor in the legibility and that high-contrast brightness combinations should be avoided.

¹⁴ Miles et al. *Evaluation of Guide Sign Fonts*.

¹⁵ Mace, D. J., P. M. Garvey, and R. F. Heckard. *Relative Visibility of Increased Legend Size vs. Brighter Materials for Traffic Signs*, Report No. FHWA-RD-94-035. Federal Highway Administration, 1994.

¹⁶ Garvey, P. M. and D. J. Mace. *Changeable Message Sign Visibility*, Report No. FHWA-RD-94-077. Federal Highway Administration, April 1996.

¹⁷ Staplin, L. K., K. Lococo, and J. Sim. *Traffic Control Design Elements for Accommodating Drivers with Diminished Capacity*, Report No. FHWA-RD-90-055. Federal Highway Administration, 1990.

¹⁸ Mace et al. *Relative Visibility*.

Appendix E. Request for Information following termination

DEPARTMENT OF TRANSPORTATION

[4910-22-P]

Federal Highway Administration

23 CFR Part 655

[FHWA Docket No. FHWA-2016-0036]

National Standards for Traffic Control Devices; the Manual on Uniform Traffic Control Devices for Streets and Highways; Request for Information Related to Use of Clearview Font

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice

SUMMARY: The Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) is incorporated by reference in regulation, approved by FHWA, and recognized as the national standard for traffic control devices used on all streets, highways, bikeways, and private roads open to public travel. This notice is a Request for Information (RFI) related to the use of the Clearview letter style on highway signs.

DATES: Responses to this RFI should be submitted by [insert date 45 days after publication in the Federal Register]. The FHWA will consider late-filed responses to the extent possible.

ADDRESSES: To ensure that you do not duplicate your docket submissions, please submit them by only one of the following means:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov> and follow the online instructions for submitting comments.
- Mail: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., W12-140, Washington, DC 20590.
- Hand Delivery: West Building Ground Floor, Room W12-140, 1200 New Jersey

Avenue, SE., between 9 a.m. and 5 p.m., e.t., Monday through Friday, except Federal holidays. The telephone number is 202-366-9329.

- Instructions: You must include the agency name and docket number at the beginning of your comments. All comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided.

FOR FURTHER INFORMATION CONTACT: For questions about this notice, contact Mr. Martin Calawa, MUTCD Team, FHWA Office of Transportation Operations, (603) 410-4864, or via email at Martin.Calawa@dot.gov. For legal questions, please contact Mr. William Winne, Office of the Chief Counsel, (202) 366-1397, or via e-mail at William.Winne@dot.gov. Office hours are from 8:00 a.m. to 4:30 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Purpose of the Notice

On January 25, 2016, FHWA published a notice in the Federal Register (81 FR 4083) officially terminating the Interim Approval for Use of Clearview Font for Positive Contrast Legends on Guide Signs (IA-5), which was issued September 2, 2004. The termination notice discontinued the provisional use of an alternative letter style in traffic control device applications. The result of this termination rescinded the allowance of the use of letter styles other than FHWA Standard Alphabets on traffic control devices except as provided otherwise in the MUTCD and within the notice. Existing signs that use the provisional letter style and comply with IA-5 were unaffected by the termination and may remain in place as long as they are in serviceable condition. The termination did not create a mandate for the removal or installation of any sign.

Following the publication of the termination notice in the Federal Register and prior to its

effective date, FHWA posted a Technical Memorandum¹ and a Technical Brief² on the MUTCD Web site. The Technical Memorandum provided guidance to the Federal-aid Highway division offices on implementation of the termination. The FHWA developed the Technical Brief for transportation agency use. It provided conclusions about the national experience with an alternative letter style and a discussion of the technical considerations that led to the termination of the Interim Approval.

After the publication of the termination notice, FHWA received comments from stakeholders suggesting that FHWA should have solicited public comment prior to the termination notice. Other comments suggested that FHWA did not consider all relevant research that was available in making its decision. As a result, FHWA is publishing this RFI in order to gather any information or research that FHWA may not have been aware of when the termination notice was prepared.

RFI Guidelines

This is not a solicitation for comments on the termination of IA-5 or for experimentation requests. The purpose of this RFI is to gather information, if any, that was not previously available to FHWA. Respondents should not include any information that might be considered proprietary or confidential.

The FHWA requests quantitative information from State and local agencies specifically related to their use of the Clearview font. Examples of the types of information we are seeking include: State or agency practice, such as the technical standards applied, including any

¹ Technical Memorandum can be accessed at the following Web address:

http://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/ia5_termination.pdf.

² Technical Brief, "Manual on Uniform Traffic Control Devices for Streets and Highways: Termination of Interim Approval No. 5, Clearview Font for Positive Contrast Legends on Guide Signs," can be accessed at the following Web address: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia5/ia5_termtechbrief.pdf.

deviations from the conditions of IA-5; factors considered in deciding to convert to the Clearview letter style or to retain or revert to the Standard Alphabets; in-service legibility evaluations; factors related to sign design or manufacturing; safety performance; economic implications; any simultaneous improvements made when converting to Clearview, such as changes to retroreflective sheeting or increases in letter height; or other similar types of information.

Conclusion

The FHWA based the termination of IA-5 on available relevant information and research. To ensure that FHWA has access to any additional information, FHWA requests any additional information regarding experience with the use of alternative fonts or research not otherwise known that may be useful to FHWA be submitted for further consideration.

Authority: 23 U.S.C. 101(a), 104, 109(d), 114(a), 217, 315, and 402(a); 23 CFR 1.32; and 49 CFR 1.85.

Issued on:

Gregory G. Nadeau
Administrator
Federal Highway Administration

