8
Type for distance viewing

In a study of the difference in the rate of confusion between letters read at distance in the foveal view and letters read up close in the peripheral view, researchers[1] found that curved letters such as 'D' and 'O' are more easily confused in close-up peripheral viewing than they are in distance viewing. Comparing this with the fact that different test methods generally produce different results, the collective data suggest that our perception of letter shapes is heavily influenced by the condition under which the letter is presented. The lack of information we experience as the number of cones decreases in the peripheral area of the retina may not be identical to the blur we experience when we focus on something in the distance with all the cones in the fovea in use *(see more in Chapter 7)*. However, in distance reading, large type sizes will appear tiny, meaning that a letter that is two metres tall when viewed at the proper distance will have the same visual angle as a 5-point letter. Such situations cause some issues to be identical between type for signage and type for micro text.

If, on the other hand, we look at large-size type viewed up close, few letters appear in the foveal area at a time. A consequence of this is that readers will find a higher differentiation level of the font acceptable in signs. Also, the task of moving the eye along the text is not as big an issue when it comes to short statements compared with what is involved in reading running text.

↓ *Figure 8.1.* **The street sign typeface by David Kindersley.** David Kindersley advocated the use of serifs on typefaces that are to be viewed at a distance. *Illustrated with the typeface Kindersley Grand Arcade, a free digital version recently produced by the Kindersley workshop.*

← *Figure 8.2.* **Round corners on FF InfoDisplay.** Erik Spiekermann and Ole Schäfer kept the corners of the typeface FF Info rounded, as they found that this feature on backlit signage prevents light shatter and makes it easier to create an even appearance. It also saves considerable time when plotting characters because the blade on the cutter does not have to be lifted and turned 90 degrees but can continue to cut in one line. *Illustrated with a photo of a sign from Düsseldorf Airport (top) and a digital rendering (bottom).*

Compensation for loss of details

The type historian Harry Carter argued that both serifs and high stroke contrast impair the reading experience for typefaces viewed at a distance[2]. The stone carver and lettering artist David Kindersley (1915-1995) disagreed strongly with this view. Kindersley believed that heavy strokes of low contrast in signage typefaces would obstruct the open counters and reduce legibility when viewed from an acute angle[3]. Like others, Kindersley had observed that both corners and characteristic parts of letters have a tendency to become rounded and lose definition when viewed from afar. Kindersley's solution in the street sign lettering he designed *(Fig. 8.1)* and later in his proposal for the British road and motorway sign system was to apply serifs to the letters; he found that the *"serif reinforces the individual character of the letter exactly where this loss is greatest"*[4].

So what is the best way to treat the corners of a signage typeface? An anecdote related to the origin of slab serif typefaces is interesting in this connection. Most historians[5] seem to be puzzled by the fact that the slab serif style was originally named Egyptian. One type historian[6], however, points to a possible logical explanation. The legend goes that during Napoleon's Egyptian campaign, the army communicated by placing stations at intervals of every few miles. Their role was to display painted messages on large boards

that could be read by telescope from the next station, which would then relay the message to the following station, and so on. The letters used for this task were apparently slab serif faces, which due to the heavily squared serifs appeared to be more distinguishable at a distance.

Although this is a nice story, the anecdote is contradicted by the fact that at the time of the first slab serif and sans serif type specimens, the slab serif was not the only one called Egyptian. For a while, the designations Egyptian and Antique were applied interchangeably to both sans serif and slab serif faces.

→ *Figure 8.3.* **Large junction by Engelhard.** Originating in the technical properties of enamel signs, the Danish architect and designer Knud V. Engelhard (1882-1931) had a love for the large squared junctions in letters such as 'A' and 'M'.

↓ *Figure 8.4.* **Large junction by Linnemann.** To improve legibility by opening the inner space of the letters and avoid cluttering both on signs and in small print sizes, the Danish type designer Bo Linnemann has adopted Engelhard's large junctions in many of his typefaces.

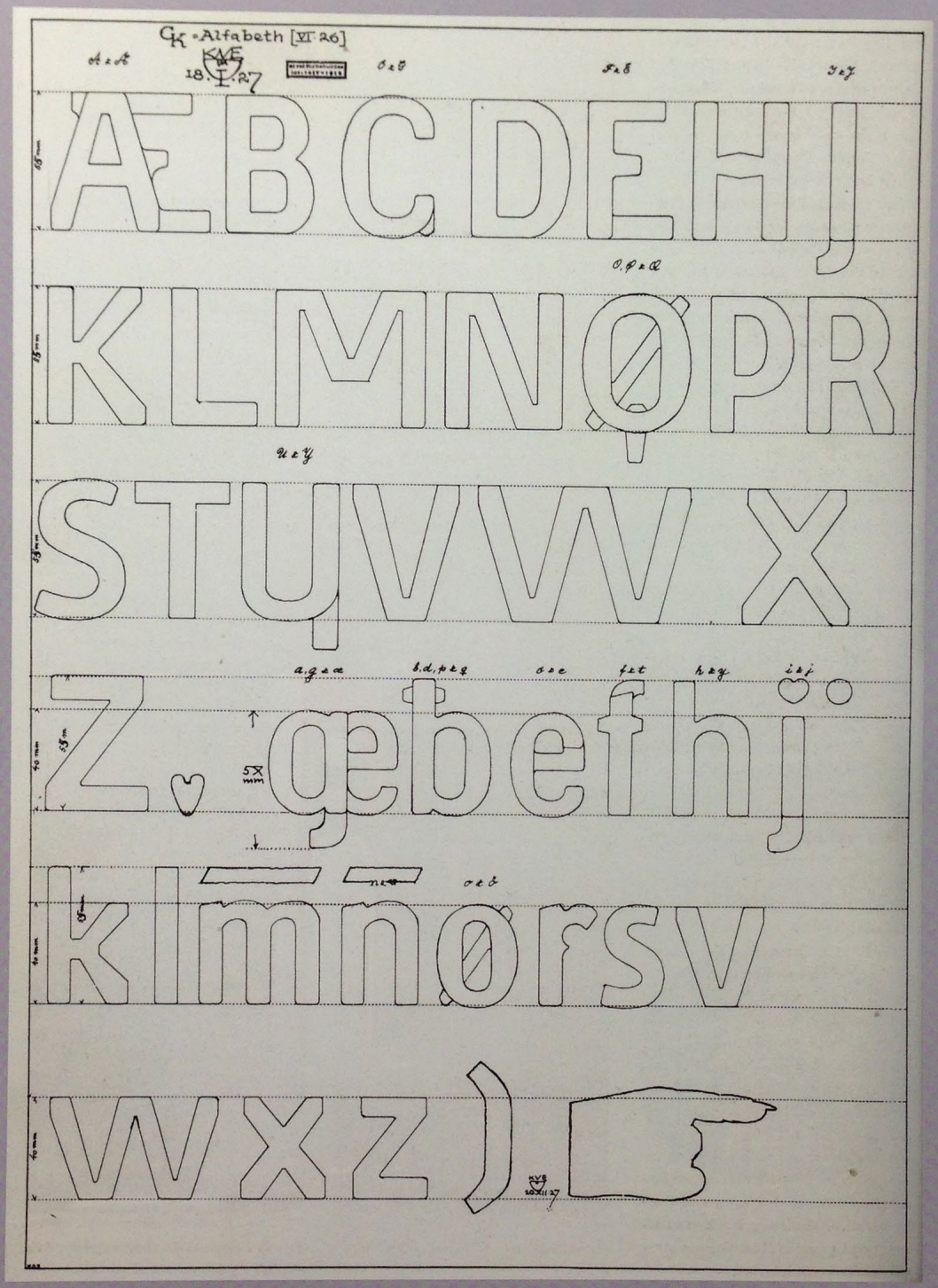
AtB by Bo Linnemann & Elias Werner

GIV DIG GOD TID
til udsalget, for A-bus kører

Danske Headline by Bo Linnemann

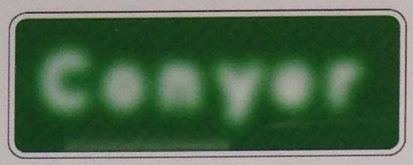
Aktuel Kredit

← *Figure 8.5.* **Round corners on M.O.L.** In 1974, when creating the backlit signage typeface M.O.L. for the Amsterdam metro, Gerard Unger based the typeface on the observation that light shining through an opening of any shape always tends to form a circle.

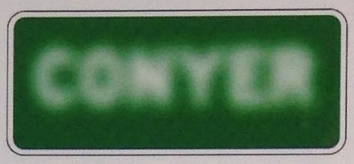

GK = Alfabeth [VI 26]
18. I. 27
ÆBCDEHJ
KLMNØPR
STUVWX
Z. gebefhj
klmnørsv
WXZ)

Proportions

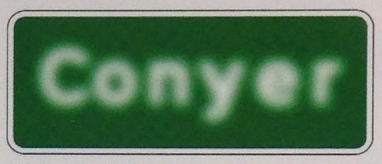
To facilitate larger point sizes and thus improve distance viewing, many signage typefaces have a narrow width. This appears to be based on a misconception. A legibility study[7] of typefaces for signage at Heathrow Airport found that the typeface Vialog appeared to be less legible than Frutiger Bold, Frutiger Roman, and the typeface BAA Sign *(Fig. 8.8)*. The fact that Vialog, which is specifically designed for high legibility, performed so poorly is rather interesting. Since the widest of the typefaces had the best performance and the narrow one performed poorly, it is possible that the poor Vialog results are caused by the width of the design. The findings are further confirmed by a number of distance studies[8] in which narrow typefaces all deliver the worst performance, and the widest typefaces the best performance. This suggests that legibility at a distance is not necessarily improved by applying larger condensed faces. Furthermore, while both continuous text and road signage are mostly read in a frontal position, other signs will often need to be read at a more acute angle, which will cause condensed characters to appear even narrower.



FHWA Series E-modified



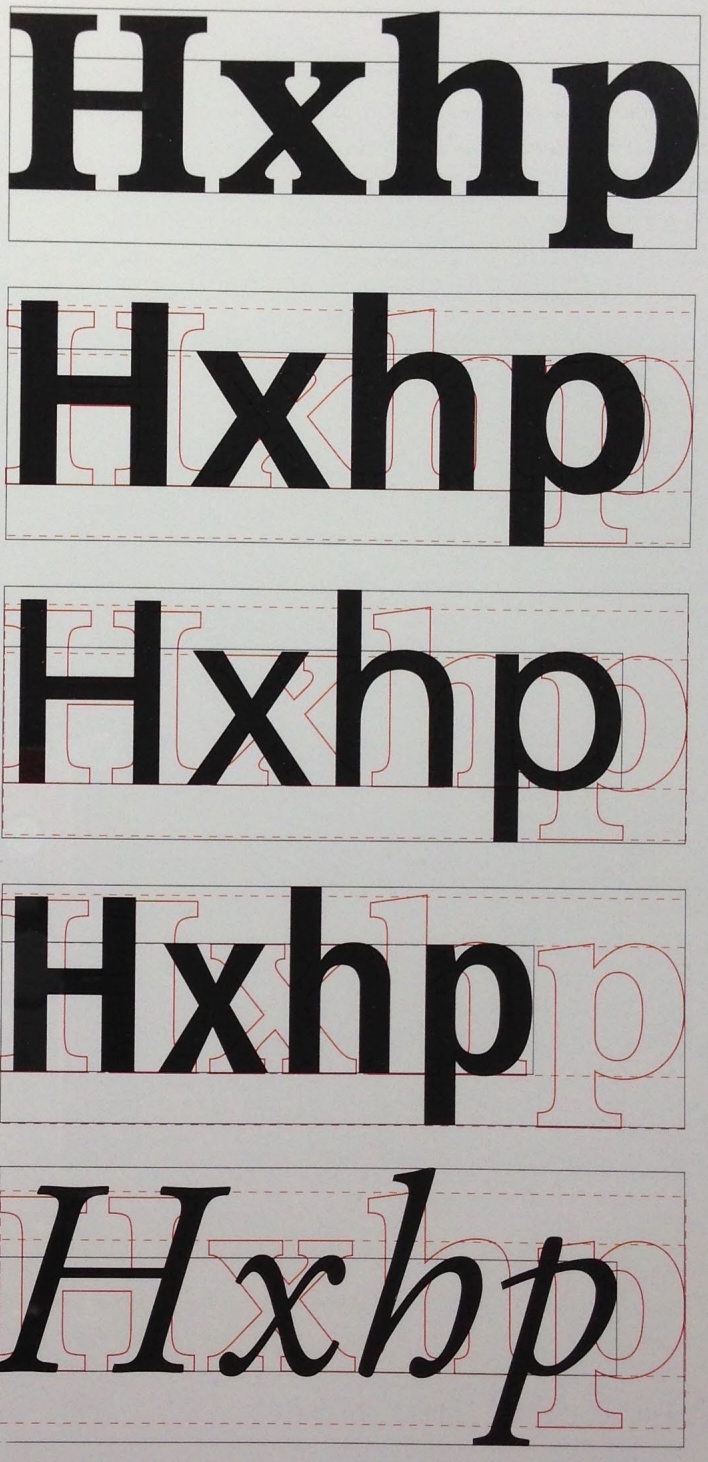
FHWA Series D



Clearview 5-W

↑ *Figure 8.6.* **Halation and the typeface ClearviewHwy.** Not all signs benefit from a bold weight. Backlit and retroflective signs tend to make type of a heavy weight bleed out by creating an overglow effect on the surface. *A simulation of halation showing the effects of overglow on the typeface FHWA (previously applied on highway signs) vs. the typeface Clearview by Terminal Design and Meeker & Associates.*

← *Figure 8.7.* **Junctions and the typeface ClearviewHwy.** To avoid the downfalls of halation, the design team behind the ClearviewHwy focused on creating open junctions and large counters in the lowercase letters 'a', 'e', and 's'. *Comparative anatomy of the FHWA Series E-modified and the typeface Clearview 5-W.*



→ *Figure 8.8.* **The most legible?** Test material applied in a legibility investigation for Heathrow Airport signage[7]. The typefaces compared were as shown (from top) BAA Sign, Frutiger Bold, Frutiger Roman, Vialog, and Stempel Garamond Italic, with BAA Sign shown in outline. The study found the narrow Vialog to deliver an inferior performance compared to BAA Sign and the two Frutiger weights.

↓ *Figure 8.9.* **The weight of Cheltenham Old Style.** In a comparison of Cheltenham Old Style (Regular), Bold and Bold Condensed, Roethlein[9] found Cheltenham Bold to be more legible at a larger distance than either the Regular or Bold Condensed, a finding that not only suggests that wider typefaces are more legible at a distance than narrow ones but also indicates that bold weights on non-reflective materials have superior distance performance compared with regular weights.

Ordinary
Bold
Bold Condensed
Wide
Italic

Figure 8.10. **The average legibility of various faces.** This overview of Roethlein's[9] findings demonstrates that typefaces with a large x-height, heavier weight, and broader width perform better than others.

A Comparison of the Average Legibility of Various Faces. Order of Legibility

UPPER CASE		Lower Case	
The Sixteen Roman Faces			
JENSON	281.7	News Gothic	236.4
BULFINCH	273.8	Bulfinch	233.6
CHELT. W.	268.5	Clearface	229.5
CENTURY O. S.	270.4	Century O. S.	228.0
CLEARFACE	269.3	Century Exp.	226.7
CHELT. O. S.	268.5	Chelt. W.	224.3
DELLA ROBBIA	266.8	Jenson	214.7
NEWS GOTHIC	264.6	Della Robbia	214.2
CENTURY EXP.	264.8	Cushing O. S.	212.6
CASLON O. S.	250.7	Ronaldson	209.2
CUSHING O. S.	247.6	Chelt. O. S.	206.4
DE VINNE NO. 2	243.2	De Vinne No. 2	204.8
RONALDSON	241.7	American Typewr.	201.7
CUSHING MON.	228.4	Caslon O. S.	201.7
CUSHING NO. 2	224.8	Cushing Mon.	190.6
AMERICAN TYPEWR.	196.8	Cushing No. 2	185.6
Average	252.8	*Average*	213.7
Bold Faces			
CENT. O. S. BOLD	296.0	Cent. O. S. Bold	255.1
CHELT. O. S. BOLD	286.2	Chelt. O. S. Bold	233.4
CLEARFACE BOLD	273.7	Clearface Bold	230.5
Average (Bold)	285.3	*Average* (Bold)	239.7

About 100 years ago, researcher Barbara Elizabeth Roethlein[9] set out to measure the legibility of a range of different typefaces in distance threshold studies. Although it was not the main purpose of her study, the findings offer useful information about typeface weight and proportions. In her list of *The Average Legibility of Various Faces (Fig. 8.10)*, we see an almost even scale, where the types with the largest x-height are the most legible, while those with a smaller x-height are less legible. A further analysis of the findings suggests that bold weights and low stroke contrast additionally enhance distance visibility on the non-reflective surfaces applied in the experiment. The same results would probably not be achieved if the letters were presented on high brightness material. With white retroflective text on a dark background, under those conditions heavy strokes will become too bright, bleed out, and visually close up the inner counters of the characters.

References

1. Reich, L. N. & Bedell, H. E. (2000) 'Relative legibility and confusions of letter acuity in the peripheral and central retina', *Optometry and Vision Science*, vol.77(5), pp.270-275.

2. Carter, H. (1931) 'Sanserif Types', in: O. Simon, (ed), *The Curwen Press Miscellany, London*: The Curwen Press, pp.35-45.

3. Dreyfus, J. (1957) 'David Kindersley's contribution to street lettering', *Penrose Annual*, vol.51, pp.38-41.

4. Kindersley, D. (1960) 'Motorway sign lettering', *Traffic Engineering & Control*, vol.2(8), pp.463-465, p.465.

5. Johnson, A.F. (1934) *Type Designs. Their History and Development*, London: Grafton & Co., p.202.

Tracy, W. (1994) 'Why Egyptian?', *Printing History*, 31/32, pp.3-10.

6. Denman, F. (1955) *The Shaping of our Alphabet*, New York: Alfred A. Knopf.

7. Waller, R. (2007) 'Comparing typefaces for airport signs', *Information Design Journal*, 15(1), pp.1-15.

8. Forbes, T.W. and Holmes, R.S., (1939) 'Legibility Distances of Highway Destination Signs in Relation to Letter Height, Letter Width and Reflectorization', *Proceedings of the Highway Research Board*, vol.19, pp.321-355.

Zwahlen, H.T., Sunkara, M. & Schnell, T. (1995) 'A Review of Legibility Relationships Within the Context of Textual Information Presentation', *Transportation Research Board*, no.1485, pp.61-70.

Schnell, T. (2008) *Legibility optimization of uppercase alphanumeric text for display messages in traffic applications*, PhD Thesis (unpublished), College of Engineering and Technology, Ohio University.

Garvey, M., Zineddin, A.Z. & Pietrucha, M.T. (2001) 'Letter legibility for signs and other large format applications', *Proceedings of The Human Factors and Ergonomics Society 45th Annual Meeting*, pp.1443-1447.

9. Roethlein, B.E. (1912) 'The relative legibility of different faces of printed types', *American Journal of Psychology*, vol.23(1), pp.1-36.