

# Clarifying Clearview

Richard C. Moeur, PE



Arizona Department of  
Transportation

# EARLY SIGN TYPEFACES

- **Sign lettering originally hand-painted or embossed on steel plates**
- **No standardization**
- **As motor vehicles traveled at higher speeds, signs became more difficult to read**

## A New Standard - 'Federal Series'

- **Originated in 1940s**
- **Established uniform typefaces for US signs**
- **Different series = different widths**
  - **Series A = narrowest**
  - **Series F = widest**
  - **Wider typefaces generally more legible**
- **Worked adequately for many years**

## Sign Typefaces Around The World

**US, Canada, Australia  
Federal Series B-F**

**United Kingdom  
Transport Medium/Heavy**

**Germany  
DIN (Mittelschrift / Engschrift)**

# Problems With E Modified

- **Fat stroke width = narrow internal spaces**
  - **especially on certain letters**



**a e i s**

# Problems With E Modified

- **Overflow (halation)**
  - **Caused by greater brightness of letters vs. background**
  - **causes letters to blur**
  - **Internal spaces 'disappear'**



aeis

# Creating A New Typeface

- **Federal Series worked well**
  - but can we do better?
- **Research goals:**
  - Reduce overglow / halation
  - Improve legibility for given letter size
  - Improve legibility for older drivers

# Creating A New Typeface

- **Studies recommend larger letter sizes for older drivers**
  - **but this could greatly increase sign sizes**
- **What if you could get increased legibility with same letter sizes?**

# Clearview Research

- **Five different studies to refine concept**
  - **Used both laboratory and field studies**
  - **Looked at existing typefaces**
  - **Adapted the "best of" each**
  - **Developed and refined letter shapes, spacing, etc. in successive studies**

# Clearview Research

- **Studies showed substantial improvements in legibility vs. E(M)**
  - **Up to 12-16% in some cases**



# Interim Approval

- **Interim Approval**
  - Use allowed with FHWA's permission
  - Is **NOT** yet OK for unrestricted use
- **Clearview Interim Approval**
  - Issued by FHWA September 2004
  - Arizona OKd by FHWA September 2005
  - Only for “positive contrast signs”
    - light text on dark background

# Where Is Clearview Used?



**...and soon in Arizona**

# Two Different "Flavors"

Clearview 1W  
Clearview 2W  
Clearview 3W  
Clearview 4W  
Clearview 5W  
Clearview 5WR  
Clearview 6W

**-W series - for light text  
on dark background  
(positive contrast)**

~~Clearview 1B  
Clearview 2B  
Clearview 3B  
Clearview 4B  
Clearview 5B  
Clearview 6B~~

**-B series - for dark text  
on light background  
(negative contrast)**

**NOT yet approved by FHWA!**

**-W series  
narrower letter strokes**

**-B series  
fatter letter strokes**

- **and yet, they appear the same!**
- **Stroke width compensates for relative appearance**

## 5W, or 5WR?

5W is preferable,  
but is wider than E(M)

5WR has same letters  
as 5W, but reduced  
spacing

which matches E(M)  
width, allowing for  
same panel size

**Destination**

**Destination**

**Destination**

# 'Bugs' in ClearviewHwy

- **Fractions**
  - “oddball” sizes
- **Spacing between letters of different sizes**
  - **ClearviewHwy in SignCAD doesn't properly space:**
    - **Cardinal directions with larger 1st letter**
    - **Suffixes (st, nd, rd, th)**

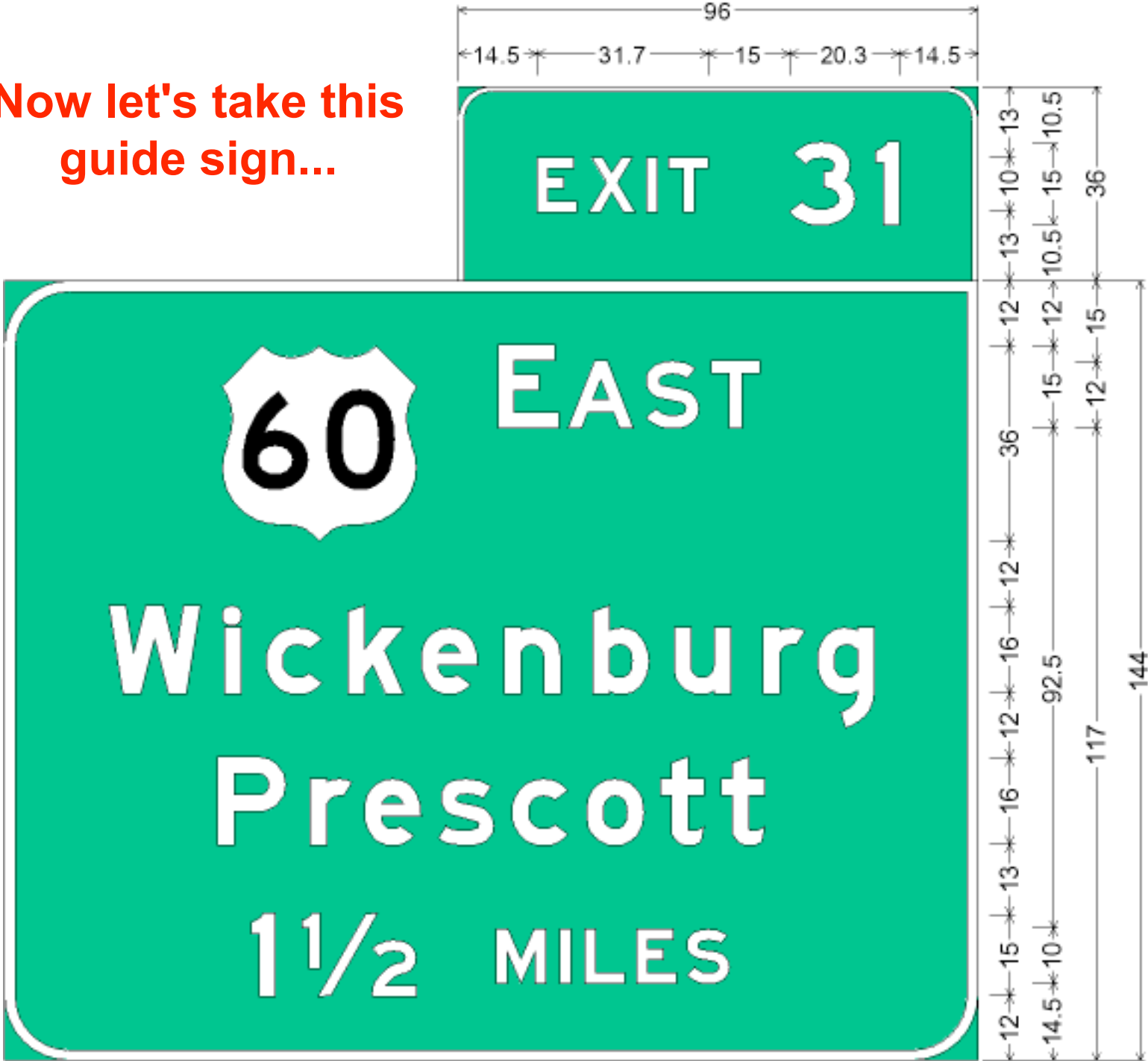
Here's a typical  
guide sign in classic  
E Modified...





- **Series E Modified:**
  - **Whole numeral and fraction are same height**
  - **Fractional numeral is exactly 2/3 fraction height**
  - **Simple, clean math for fractions**

Now let's take this  
guide sign...







- **Clearview:**
  - Fraction now larger than whole numeral
  - Fraction is not aligned with other letters
    - No easy way to lay out by hand on sign panel
    - Doesn't line up with baseline, loop height, or uppercase height
    - Offset vertically - not centered



- **Actual fraction vertical dimension is 109% of 'nominal' size**
- **Fractional numeral in Clearview is 8% smaller than standard size**
  - **Violates MUTCD (Table 2E-4)**
- **Actual fraction dimension is "odd" size**
  - **Doesn't line up well with even-inch spacing**



- **Need to increase fraction size to get MUTCD compliance**
  - **16.4" nominal fraction size yields 10" fractional numerals**

**...but now the fraction is actually over 19" tall!**

**... and still doesn't line up with anything**



1 <sup>1</sup>/<sub>2</sub> MILES

- For SignCAD plans to display correct Clearview fraction size, designers must convert every fraction to graphic
  - One done, cannot be changed
  - Very tedious manual work
  - If not done, sign dimensions are wrong
  - Doesn't ensure the sign will actually be built with correct fraction

# Possible Solutions

- Use the built-in fraction
- Keep converting fractions to graphic
- Develop a new fraction
  - If made same height as whole numeral, then dimensions are much simpler
  - Turns out some sign manufacturers were already making Clearview signs this way! (not using built-in fractions)



- **ADOT-modified fraction:**
  - Same height as whole numeral
  - Same height as traditional fraction
  - Keeps sign panel dimensions simple
  - Ensures that sign as designed will be consistent with sign as built
- **Use this modified fraction instead of built-in fraction on ADOT projects!**

# Letter Spacing

**NORTH**

- **If all letters are the same size, no problem with spacing in SignCAD**

# Letter Spacing

**N O R T H**

- **SignCAD reverts to 0" default spacing between letters of different sizes**
  - **this doesn't really look right...**

# Letter Spacing



NORTH

→ | ← 4" space for 15"/12" lettering

- **Sign designers must insert space by hand to fix**
  - **Tedious work**
    - **Hoping to automate in future in SignCAD**

# New SignCAD Templates

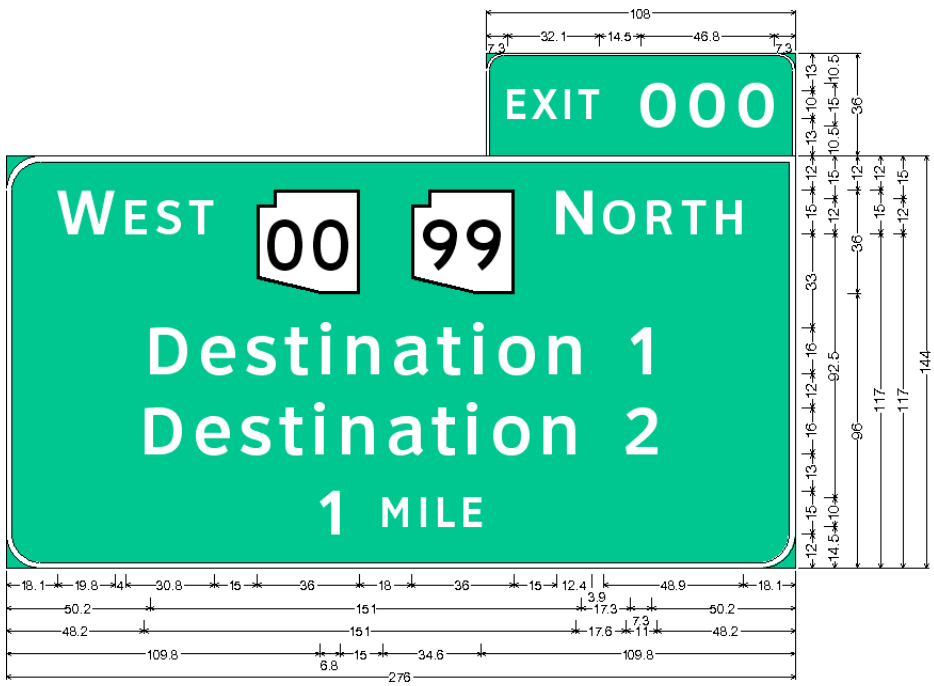
- **ADOT is developing SignCAD templates for nearly all standard guide signs**
  - **Freeways**
  - **Conventional roadways**
  - **Ramps & freeway crossroads**

# New SignCAD Templates

- **Templates will have “info boxes”**
  - **Correct vertical dimensions**
  - **Hints & tips for formatting**
- **Templates will incorporate Clearview typefaces**
  - **Including ADOT-specific fractions**
- **Still under development**
  - **Will be released when completed**

# New SignCAD Templates

**E1-1gi.sgn**  
Advance guide sign for intermediate/minor interchanges with two numbered routes with different cardinal directions & two destinations

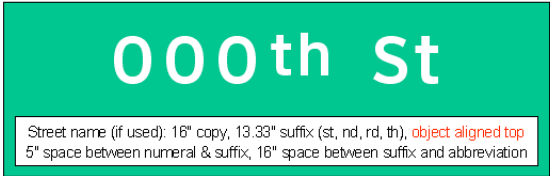
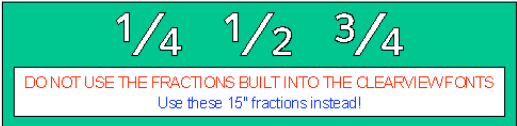


6.0" Radius, 1.0" Border, White on Green;  
 "EXIT 000" ClearviewHwy-5-W;  
 12.0" Radius, 2.0" Border, White on Green;  
 "W EST" ClearviewHwy-5-W; State Highway 00 M1-5c; State Highway 99 M1-5c; "N ORTH" ClearviewHwy-5-W;  
 "Destination 1" ClearviewHwy-5-W; "Destination 2" ClearviewHwy-5-W; "1" ClearviewHwy-5-W; "MILE" ClearviewHwy-5-W;

**E1-5 exit number panel**  
All Legend Clearview 5-W

36" panel height	1 digit - 84" wide
Center legend vertically on panel	2 digit - 96" wide
10" EXIT	3 digit - 108" wide
15" numerals	4 digit - 132" wide
	"XXX A-E" - 180" wide

**E1-1gi panel**  
All Legend Clearview 5-W(5-WAR can be used if panel width is a concern)  
 144" panel height  
 12" between top of panel & top of shield  
 36" shields, 18" spacing between shields, 15" spacing between shields and cardinal directions  
 15" / 12" cardinal directions, object aligned with top of shields, text aligned baseline  
 4" spacing (single space at 5" nom. height) between 1st & 2nd letter of cardinal direction  
 12" between bottom of shields & top of 1st destination  
 Destinations: 16" copy  
 12" between destinations  
 13" between bottom of destination & top of numeral/fraction in distance message  
 Distance message: 15" whole numeral, 15" fraction (using 10" numerals), 10" MILE  
 5" space between whole numeral & fraction, 15" space between numeral/fraction & MILE  
 Use "MILE" legend for all distances 1 mile & less, "MILES" for distances greater than 1 mile  
 12" between bottom of numeral/fraction in distance message & bottom of panel



# Questions?

- **Richard C. Moeur, PE**
  - (602) 712-6661
  - <http://www.richardcmoeur.com/>
- **FHWA webpage on Clearview:**
  - <http://mutcd.fhwa.dot.gov/HTM/clearfont/index.htm>
- **ClearviewHwy font website:**
  - <http://www.clearviewhwy.com/>
- **'Freeware' Clearview fonts:**
  - <http://www.triskele.com/>