Laura Rodman Huaracha
lhuaracha@carthage.edu
Carthage College, Kenosha, WI

Saving Lives With Geography & Graphic Design

Utilizing GIS mapping to support the implementation of ClearviewHWY, a typeface built for high legibility on road signage

The Motivation

I've got a mean older brother. Growing up his job was chasing me with snakes. Now he is a very proud wildland firefighter. A few years ago he claimed, "I save lives all the time. Graphic designers never save lives."[1] As a proud graphic designer, I've been trying to prove him wrong ever since.

Since 1981 when they began tracking the data motor vehicle crashes have been one of the leading causes of death in the United States.[2] Confusion on reading or seeing highway signs is a definite cause of driver distraction and research tells us that somewhere between 25-50 percent of all motor vehicle crashes in this country have driver distraction as their root cause.[3] My work starts with calling attention to the issues with current highway signage. These signs are mainly set in upper case, with small counterforms causing reduced legibility. The highway ready font, ClearviewHwy, was created through ten years of research by graphic designers, perceptual psychologists, human factors scientists and highway engineers in conjunction with the Federal Highway Administration. Clearview is a sans serif typeface created to improve legibility and readability of same size guide signs by 20 percent while reducing halation for older drivers or drivers in inclement weather.[4]

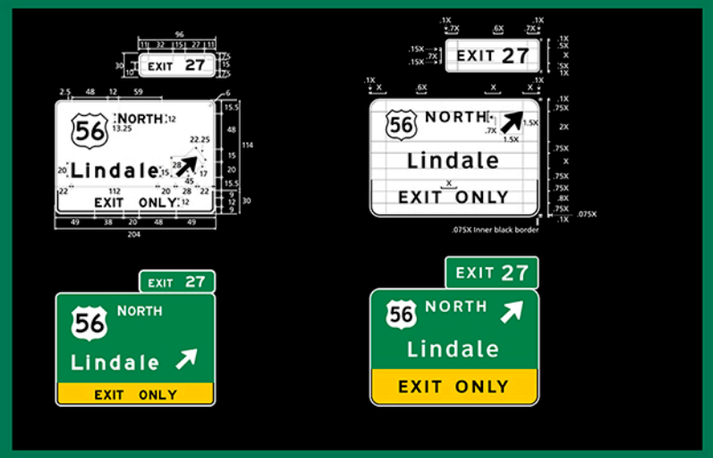

Figure 1. Existing dimension and signage on the left, Clearview signage on the right.

Figure 2. Note the unique characteristics of Clearview letterforms, larger counters with short x-heights.

The Research

The FHWA granted Clearview interim approval in 2004, meaning that individual states are free to begin using it in all their road signs. Over the past 9 years, 30 states have adopted the typeface, but not universally, and only on a sign by sign basis. This is a slow and costly process, which could use some encouragement. My research is to show "target points" that need Clearview in the U.S., starting in the state of Florida.

Florida embodies several of the attributes which indicate a need for Clearview; it ranks 19th for highest number of highway deaths per 100,000 people[5], Florida's Highway I-95 is ranked #1 for deadliest highways.[6] Florida has the highest percent of population over 65 (17.6%)[7] (on a per-mile basis, elderly drivers have a higher than average fatality rate, similar to that of teen-age drivers.[8]) and it is among the top three states in terms of crashes due to vision obstruction by fog and smoke. [9]

The Results

Figure 4 shows how Clearview is currently only implemented on Orlando-Orange County Expressways. Figure 3 & 5 define the area circling the panhandle of Florida that would benefit from Clearview usage. Although I can not prove that accidents occurred because of poor signage legibility, I can prove that these areas have a high likelihood of people who would benefit from signage with increased legibility; thus encouraging the FHWA to consider those areas for speedier implementation. In future research I hope to find more areas of the U.S. with "hot spots" and I hope to try to track where Clearview has been implemented and to show any change to roadway fatalities over time.

Figure 3. GIS map of several datasets[10]:
a) 18% or more of the population is 65 & over
b) The average # days of heavy fog are 10.5 to more than 40.4 per year
c) average # days with measurable rain is 60.5 to more than 150.4 per year

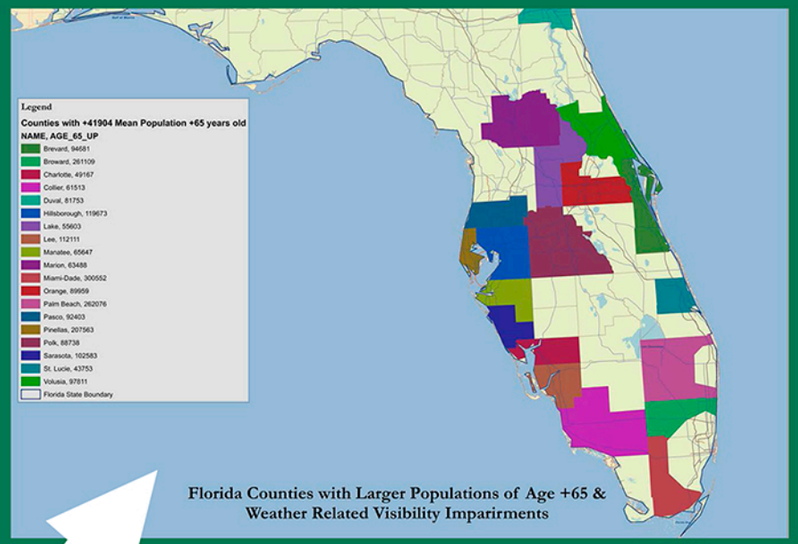

Figure 4. Clearview is currently only implemented on Orlando-Orange County Expressways.[11]

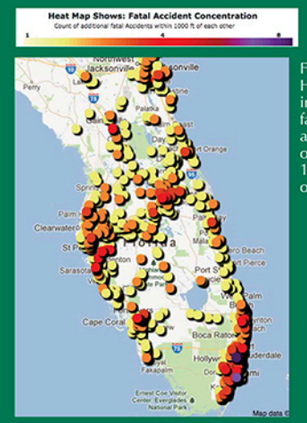

Figure 5. Heat map indicating fatal traffic accidents that occur within 1000 feet of one another[12]

Special thanks to:
1) The creators of ClearviewHWY, Donald Meeker, James Montalbano, Christopher O'Hara, Martin Pietrucha, Philip Garvey, Foundry: Terminal Design Inc., the Texas Transportation Institute and the Pennsylvania Transportation Institute, and Federal Highway Administration (FHWA)
2) Carthage Associate Professor of Geography Robert Esdell
3) Ernesto Huaracha, loving husband & GIS enthusiast

Works Cited:
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4) Clearviewhwy website
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6) US News, May 2010
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11) Orlando-Orange County Expressway, https://www.oocea.com
12) National Highway Traffic Safety Administration, http://riskyroads.org/Florida