

# Sacramento 3,073 Miles: road signage and contextual communication on America's legacy highways

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Figure 1 / Where US 50 begins in Ocean City, Maryland

A recent exhibit at the Philip M. Meyers Gallery at the University of Cincinnati summarized five years of photography and analysis of highway signage and the built and natural environmental context along America's iconic roadways. The exhibit, curated by professors Hank Hildebrandt and Chris Auffrey, documents historic and contemporary signage found along three of America's iconic legacy US highways. Over a five-year period, professors Hildebrandt and Auffrey made 15 road trips to collect photographic and experiential data about signage design, placement and context. They drove 3,073 miles east-to-west across the middle of America on highway US 50 from Ocean City,

## **Abstract /**

Over a five-year period, photographic and experiential data was collected about signage design, placement and context along America's iconic legacy US highways. Over 10,000 miles were traveled and more than 15,000 photographs were taken to represent the broad range of signs, placements, and contexts representing current tastes, norms and trends, but also the nearly 100-year history of highway signage as an essential form of American visual communication. This work captures the use and evolution of road signage to communicate public safety, wayfinding, and commercial messages along historic highways routes, and establishes the special importance of the specific environmental context in which the signs are situated for determining how effectively they communicate their messages. Analyses of the signage using visual attention software tools show that identical signs with identical placement will capture visual attention differently depending on the specific characteristics of the visual context.

## **Keywords /**

highway signs; visual communication;  
environmental context; visual attention.

Maryland to Sacramento, California; 1,407 miles south to north on highway US 61 from New Orleans to the Canadian border; 2,448 miles on historic Route US 66; and made additional trips to places such as Williston, North Dakota, Branson, Missouri and Huntsville, Alabama. In all, they logged over 10,000 miles and took more than 15,000 digital photographs. The exhibit depicts the use and evolution of road signage to communicate public safety, wayfinding, and commercial messages along historic highways routes, and establishes the special importance of signage design and placement for the specific environmental context in which the signs are situated for determining how effectively they communicate messages.



Figure 2 / Highways traveled over the five years of the project.

For this research project, highway US 50 was initially chosen because it is a central spine for the American continent that extends from coast to coast, is largely intact along its historic roadbed, and provides a broad range of contexts for signs and buildings. A typical day consisted of 12-16 hours of driving and taking photographs, often long into the night. The project started in Ocean City, Maryland and drove west along US 50: across the Appalachians, through the Midwest farm country and Great Plains, across the Rockies and western deserts, and over the Sierra Nevada to a final destination in San Francisco.

To better capture the broader range and depth of the American road experience, Auffrey and Hildebrandt expanded their travel to three other legacy US highways: US 61 from New Orleans to the Canadian border, US 66 from Chicago to Los Angeles, and portions of US 31 through Kentucky, Tennessee, and as far south as Huntsville, Alabama. Supplemental trips also were made to significant locations with unique signage contexts, including Branson, Missouri, Williston, North Dakota, and the Las Vegas strip. Ultimately, the goal was to observe and document, from the perspective of the motorist, those visual elements that signify road culture past and present, and that serve as foundations for the future. Visual attention software tools were used to analyze the images, allowing the capture of visual attention to be used as an indicator of the communication value of signs, symbols, and building form. The analyses focused on measuring the effectiveness of road signs as they are displayed and perceived in specific natural and built environment contexts. The results support an understanding of roads as corridors of complex environments



Figure 3 / Great American Steak & Chicken House, Branson, Missouri.

where movement and communication are intertwined in an infrastructure of vehicular movement patterns, organized around the efficient mobility of persons, in parallel with the infrastructures about communication of goods and services, wayfinding, and public safety. These diverse purposes can, at times, create competing priorities and lead to ambiguous (and sometimes amusing) conditions.

Signs were photographed from the front passenger seat of a car on public roads, as a typical motorist would see them while driving at normal speeds. These images include small local businesses, large commercial chains, public wayfinding, landmarks, and informational signs. From these, a range of broad typologies were created to assess the relative effectiveness of patterns of visual communication for individual signs and their context, as compared to other examples of the same type.

## HIGHWAY US 50: SIGNAGE OF AMERICA'S LONELIEST HIGHWAY

Cities and towns in the United States have historically developed in settlement patterns linked by paths that became roads and highways. Whether connecting a crossroads hamlet of a few houses and a trading post, or larger intentional settlements and social assemblies, the continental expansion of the American landscape eventually required a formal system to facilitate the transfer of people, goods, and ideas. The emerging US highway system initially relied on Old World precedents, but quickly responded to the conditions of our nation's expansive landscapes and diverse geographic contexts. The demand for highways was



Figure 4 / El Rancho Hotel & Motel, Gallup, New Mexico

driven by rapid improvements in automotive technology and the affordability of car ownership, which facilitated the expansion of intercity transit. The result was a new American road culture and a distinctive American attitude about the “lure of the open road,” where signage was critical for wayfinding and commerce.

As Americans took to the highway, concrete and asphalt ribbons between cities transformed rural landscapes to purpose-built road corridors serving the needs of commerce and freedom of movement. The legacy corridors of the original US highway system (started in 1926) provide an especially powerful display of American road signage, reflecting the evolving culture

and systems of visual communication in the cities along these routes. It is in this vein that this research sought to document and analyze the road signage along America's iconic legacy highways.

The analysis focused on the effect of the surrounding natural and built environments on the visual attention captured by these signs. As such, it was considered that this knowledge can be used to better understand the design and regulation of visual communication in the future.

This case study of highway US 50 showcases the wide range and depth of signage across America and reflects the larger values of American transit and commercial attitudes. The mix of old and new signage describes the visual history of the highway system, and how different strategies for attracting visual

attention and disseminating information evolved over time. Signs are reflections of culture and how society chooses to transmit information, in this case along the linear space of highways. The range of usage and intention in the signage also allowed for an examination of the distinct hierarchies of visual data. Through an understanding of the historical context behind the development of the highway system and a visual study of the system's signage, the research was informed by the strategies and evolutionary developments resulting in the signage seen today.

### ROAD SIGN TYPOLOGIES: A SYSTEM OF CLASSIFICATION FOR ANALYSIS OF EFFECTIVENESS OF HIGHWAY SIGNAGE

Drivers today are exposed to many types of visual stimuli from the varied road signage along



Figure 5 / White Horse Trading, Williams, Arizona.

America's highways. The design and placement of road signage is focused on capturing the visual attention of those passing by to effectively communicate specific messages. It follows that signs are tightly linked to the built environment they are designed to describe, but they are also more than conveyors of messages; signs combine with the natural and built environment to make unfamiliar places and objects recognizable to unfamiliar audiences. The combination of sign, building, and other environmental contextual factors frame the sign's symbols and text within a broader physical setting, which impacts the way a message is viewed and interpreted.

|  |   |   |   |
|--|---|---|---|
| <p>CITY WELCOME</p>       | <p>DIRECTIONS/COMMUNICATION</p>  | <p>OBJECTS</p>          | <p>STATELINES</p>            |
| <p>DOWNTOWN STREETS</p>  | <p>TRUCK STOPS</p>              | <p>STRIP SUBURBAN</p>  | <p>WATERTOWERS</p>          |
| <p>MCDONALD'S</p>       | <p>DAIRY QUEEN</p>             | <p>BAR/LOUNGE</p>     | <p>MOM &amp; POP SHOP</p>  |
| <p>COMMERCIAL</p>       | <p>POINTS OF INTEREST</p>      | <p>HOTEL/MOTEL</p>    | <p>UNIQUE SIGNS</p>        |

Figure 6 / Representative typologies of highway signage.

In order to estimate the effectiveness of a sign at communicating visual messages, we have set out to structure the objective criteria of communication in this format through categorization. Ultimately, a sign's ability to capture attention

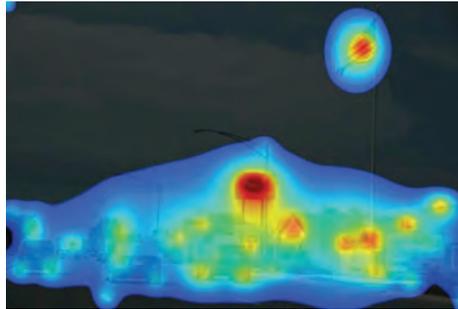
is dictated not only by its design and placement, but by its specific purpose and environmental context as well. To analyze this, we can apply existing research on the behavioral patterns that humans use to perceive visual objects.

From the images gathered over the course of this study, a matrix of sign typologies was developed. The intent was to classify the potential range of sign-environment combinations as they relate to program and context. Through this study we began to understand how complex the sign-context relationship has become over its evolution, and how that applies to current examples. These complexities are refined and expressed through these typologies, facilitating the process of arriving at meaningful conclusions through analysis. The resulting classification system has made possible deeper study of text and graphic messaging and has led to preliminary analysis of legibility and effectiveness of signage. By analyzing variants of signage from the same typology, our research is able to expose subtle variations of efficacy within these typologies.

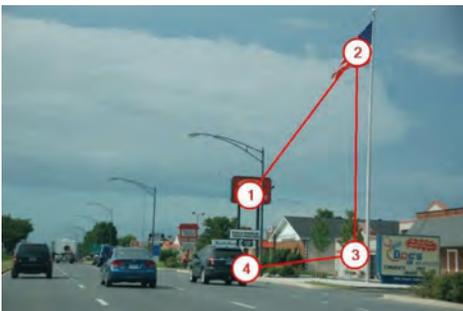
Original image



Heat Map for Visual Attention



Predicted Order of Visual Attention



Likely of Visual Attention for selected Areas of Interest



Figure 7 / Results from analysis of roadway image using Visual Attention Software.

## RELATED RESEARCH

### A Study of the Probability that Motorists View On-Premise Signs Using Visual Attention Software

The study sought to investigate two topics: the extent to which on-premise signs (OPS) along US roadways attract the visual attention of passing motorists, and whether the OPS of national and regional businesses are more effective for this when compared to the OPS of locally-based businesses. Visual Attention Software was used to create data based on a sample of OPS and roadway contexts captured in photo images from along the 3,073 miles length of highway US 50. The findings suggest that a substantial proportion (approximately one-third) of the

on-premise signs along roadways in the US are not being viewed by motorists as business intended. Also, findings show that the average probability of OPS of national and regional businesses being viewed is significantly higher than for the OPS of local businesses.



Figure 8 / Home “repurposed” road sign along US 50 near Kinsley, Kansas.

### **A Study of the use of Visual Attention Software (VAS) to Assess Wayfinding in Building Interiors**

Students at the University of Cincinnati in the School of Architecture and Interior Design (SAID) applied VAS technology to a sequence of images representing a walking path through the DAAP building on the UC campus; the DAAP building is notoriously difficult to navigate. The research involved analysis of interior images from DAAP in their original form, and with enhanced, altered or new signage superimposed on the original images using Adobe Photoshop software. The results showed the altered and new signage consistently changed viewing probabilities for areas of interest and suggested that wayfinding in the building could be improved when guided by the results of applications of this type of analysis.

When taken together, the results of these two studies outline a clear direction for future research in this area: if simulations of signage alterations in DAAP show measurable improvements in a virtual analysis, it can be surmised that similar improvements can be made in signage for businesses and public wayfinding in many other exterior and interior applications. The results

further suggest virtual analysis of the images could help to guide these improvements, and assist efforts to create research methodologies for large scale studies with human subjects and state-of-the-art eye tracking technology such as the Tobii Pro Glasses 2 (featured elsewhere in this exhibit).

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