

DECLARATION OF RONALD B. GIBBONS

Pursuant to ARIZ. R. CIV. P. 80(i), DR. RONALD B. GIBBONS hereby declares under penalty of perjury under the laws of the State of Arizona that the following is true and correct:

1. I am the group leader of the Lighting and Infrastructure Technology Group at the Center for Vehicle and Infrastructure Safety in the Virginia Tech Transportation Institute, a research division of the Virginia Polytechnic Institute and State University. In my work, I regularly perform human factors based scientific experiments investigating visibility and driver distraction issues both in test track and naturalistic environments. My Curriculum Vita is attached to this document as Exhibit 1.

Project Statement

2. **I have been asked to evaluate bus shelter advertising, bus bench advertising and billboards in the city of Tucson as they relate to driver safety.**

Work Performed

3. During the course of this effort the following work was performed:
 - Preparation of a Literature Review of suitable published material
 - Review the following documents relating to this case:
 - Clear Channel Outdoor Inc.'s Amended Counterclaim against the City of Tucson
 - Motion for Partial Summary Judgment by the City of Tucson
 - City of Tucson's Separate Statement of Material Facts in Support of Motion for Partial Summary Judgment including the 43 attachments
 - Site Visit and review of Billboard and Street Furniture advertising in the City of Tucson
 - **Evaluating driver distraction issues relating to advertising on street furniture and billboards in the City of Tucson**
 - Evaluation of the effects of advertising positioning for the driver.
 - Report Preparation

Site Visit Activities

4. During the site visit, billboards, bus shelters and bus benches on several roadway were reviewed. These roadways included but were not limited to:
 - Broadway Boulevard
 - Speedway Boulevard
 - Pima Street

- Grant Street
 - Prince Road
 - Fort Lowell Road
 - Oracle Road
 - Wetmore Road
 - Irvington Road
 - Country Club Road
5. While touring the roadways, particular attention was paid to the location and advertising copy on the bus shelters, bus benches and billboards. Photographic images were taken which depicted the location of the advertising with respect to the typical line of sight of the driver.

Literature Review

6. During the literature review, two areas of interest were investigated. The first was the impact of driver distraction on driver safety. The second was the impact of advertising signage on driver behavior.

(A) Distraction and Driver Safety

7. In a recent landmark study by Dingus et al (2006), driver behavior in 100 vehicles was monitored for one year through the use of inside-the-vehicle video surveillance and instrumentation. In all over 42,000 hours of driving were monitored. A total of 9138 crashes, near crashes and incidents were evaluated in terms of causation. The research determined that the primary causes of accidents were secondary task distraction such as cell phone use and eating, driving related inattention to the forward roadway such as monitoring the instrument panel, fatigue and other non-driving related eye glances. Within this classification methodology, looking at advertising copy would be classified as a non-driving related eye glance. In the research, this category of distraction was determined to be an issue in 112 of 9138 investigated incidents which is less than 1.3% of the events. This category was further broken into five sub-categories: looking at an object, looking at a pedestrian, looking at a previous crash, distracted by construction, and other indeterminable distractions. Within these sub-categories, 5 events were attributed to looking at objects, 6 were attributed to looking at a pedestrian, 3 were looking at previous crashes, 1 was looking at construction and 97 were undetermined.

(B) Advertising Signage and Driver Behavior

8. Given the evidence that a distracted driver can be an unsafe driver, the next question focuses on the influence of advertising signage on driver behavior. As set forth below, studies indicate that advertising signage does not lead to traffic accidents except in very limited circumstances.

9. Johnson and Cole (1976) determined that the addition of advertising to the visual scene had no impact on the performance of a tracking task until the perceptual load (i.e., visual stimuli) increased beyond an optimal arousal level. The tracking task in this research was one which required the experimental participant to control an experimental simulator to follow an arrow presented to them on a screen. The research showed a potential benefit of advertising in times of low perceptual loading (i.e., a simple visual environment devoid of significant roadside structures) where the presence of advertising may assist in increasing the driver's awareness to an optimal level and improve their driving performance.
10. A study by Lee, Olson and DeHart (2004) provided a naturalistic driving assessment of the impact of advertising on driver behavior. They found that the presence of signage did not influence driving behavior. They found that the presence of signage can increase the driver's eye scan pattern frequency and may result in a greater eyes on road time than in the situations with no signage at all. A more recent study, Lee, McElheny and Gibbons (2007) verified these results for both daytime and nighttime situations.
11. Both Lee et. al studies (2004 and 2007) and Johnson and Cole found that the presence of advertising can increase the driver's arousal level and actually improve driver performance. In visually complex environments, where perceptual overloading may be an issue, the research also shows that a driver adapts to the task they are performing. Luoma (1986) tested the ability of a driver to perceive signage in the presence of complex visual environments. Here, it was found that the drivers will seek out the information they require and were not negatively impacted by the presence of billboards.
12. Combining the work of Dingus et al and the signage research suggests that the presence of signage will aid in overcoming some of the limitations due to fatigue by increasing the driver's arousal level, but that minimizing eyes off road time is also important to driver safety.

Evaluation of Bus Shelter and Bus Bench Advertising in the City of Tucson

13. While the literature suggests that the potential for driver distraction from outdoor advertising is minimal, I compared the relative potential for distraction between advertising on roadside street furniture and advertising on billboards.
14. The potential distraction of signage for a driver is typically a result of causing the driver to glance away from the roadway. During the site visit, it was determined that the deviation of the eye from the roadway would be the same or greater with bus shelter and bus bench advertising than with billboard advertising. The bus shelters and bus benches are significantly closer to the roadway than billboards, and are placed within the roadway right-of-way. (The documents from the City state that advertising faces on bus shelters and bus benches are typically 6 ft. from the roadway, whereas billboards are to be

positioned at least 21 ft. or further from the roadway.) Additionally, the advertising copy on bus shelters and bus benches is much smaller and designed to be read from a much shorter distance than similar copy on billboards. As a result, the actual angular deviation of the eye from the roadway is increased for the bus shelter and bus bench advertising as compared to the billboard advertising. This means that a driver who is looking at bus shelter and bus bench advertising is turning their head farther from the direction of travel and potentially increasing their eyes off road time and their distraction level. This is shown in Figure 1 which is attached as Exhibit 2. Here an advertising bus shelter and a billboard are on right side of the roadway. The image was taken from a moving vehicle when the text on the right hand bus shelter became legible. It can be seen that the information in the billboard in the distance is also visible. In the image, the yellow line depicts the desired line of sight for the driver (Straight down the roadway). The red line depicts line of sight to the bus shelter and the blue line depicts the line of sight to the billboard. The angle from the yellow line of sight to the billboard or the bus shelter line indicates the possible deviation of the driver's eye from the roadway when the driver is looking at the various advertising. It can be seen that the angles to the bus shelter is greater than that to the billboard. This shows the potential for equal or greater distraction by the bus shelter as compared to the billboard due to this increased viewing angle.

15. Another aspect of potential driver distraction is the bus shelter and bus bench advertising located on the opposite side of the road from the driver's direction of travel. In this case, the potential for distraction is greater than that of a typical billboard. The small text and graphics on the bus shelter and bus bench forces the driver to look across all of the traffic lanes creating a greater visual angle deviation than a billboard. An example of this is shown in Figure 2 of Exhibit 2. Here, the bus shelter advertising text is just legible from a distance of approximately 140 ft. However due to the proximity of the advertising, the driver must turn their head 30 degrees to the left in order to read it which is far more significant than experienced from the farther distanced advertising billboards. These angles are depicted in the image with a yellow line indicating the line of sight of the driver. (Note that the angle is not to scale due to the perspective in the image.) This deviation of the advertising from the line of sight of the driver further increases the potential eyes-off-road-time of the driver and therefore increases the potential for distraction.
16. Another issue of driver distraction is the close proximity of multiple bus shelter and bus bench advertisements to each other. This problem was observed in two ways. The first was that some of the bus shelters in Tucson allow for two advertisements that face an approaching driver to be installed in one shelter. The other issue is the installation of multiple structures in close proximity. During the site visit, I observed several locations with multiple advertising bus shelter installations positioned closely together. This was particularly exacerbated at intersections where advertising bus shelters can be located

both on the street of travel and the cross street. A driver at a major intersection can be distracted by the advertisements on bus shelters at as many as four different visual locations.

17. One of the observations made of the bus bench advertising was the orientation of the bench with respect to the roadway. Many of the benches with advertising were positioned such that they were parallel to the roadway. In order to read the advertisement on the benches in this orientation, the driver must be almost directly perpendicular to the bench. This means that the driver's eye is deviated almost 90 degrees from the road centerline and the direction of travel. This is shown in Figure 3 of Exhibit 2. Here the text on the bus bench is viewed out of the side window of the vehicle in order for it to be read. This represents a significant angular deviation from the line of sight down the roadway. This orientation on many of the bus benches has a significant potential for distraction of the driver.
18. In the Motion for Partial Summary Judgment, the City asserts that "Because they [advertising bus shelters and bus benches] are in the rights-of-way, a passing driver who averts his or her eyes to see the sign will usually still have the road within view". Based on my observations during my site visit and as discussed above in paragraphs 14 through 17, I believe this statement to be false.
19. Similarly, in the Motion for Summary Judgment the City also asserts that "Proximity to the roadway [of advertising shelters] also minimizes distraction, because it means that these signs pass in and out of the driver's field of view much more rapidly than does a larger sign sitting further back from the roadway." Based on my observation, this statement is also false. Again, the short legibility distance of the bus shelter and bus bench advertising limits the amount of time the driver has to read the information. The billboard which is visible from greater distance and in the field of view for a longer period of time allows the driver to choose when it is safe to read the sign rather than being forced to read it at a close proximity.
20. Another issue which was observed relating to safety of bus shelter users was the illumination. In this regard, I disagree with the City's assertion that the advertising bus shelters provide optimal illumination for shelter users. In the advertising bus shelter, the only source of illumination is from the advertising panels themselves. There is no other light source within the structure. The lighting of the bus shelter utilizing the advertisements as the light source is not an effective method of lighting this type of facility. Bus shelter lighting would typically be from above, close to the roof of the shelter. Lighting from above, as I observed was used in older non-advertising bus shelters, controls light pollution and provides lighting on the users of the facility. However, the lighting method used in the advertising bus shelters in Tucson is from the side advertising panel which is not as effective as lighting from above. With side lighting,

as a pedestrian approaches the shelter any person already in the shelter will be seen in silhouette against the advertising. This is significant for user safety as the approaching person would not be able to see the face of the persons already using the facility. The lighting system is designed to light the advertising and is not effective for lighting the shelter.

Conclusions

21. The conclusions of this report are:

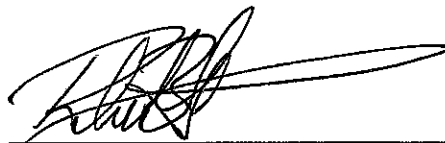
- Bus shelter and bus bench advertising in Tucson poses an equal or greater potential for driver distraction as compared to advertising billboards.
- The size of bus shelter and bus bench advertisements forces the driver to read them at shorter distances than billboards, which can increase the potential for distraction.
- Bus shelters and bus benches which are located on the opposite side of the road can greatly increase the potential for distraction due to the angle of visual deviation from the direction of travel required to read the advertisement.
- In locations where multiple bus shelter and bus bench advertisements are visible, the potential for distraction is increased. At intersections, the bus shelter and bus bench advertisements can increase the potential for distraction when observing the fixtures on the cross street.
- Bus bench advertisements can create a greater distraction based on the orientation of the bench to the roadway.
- The advertising bus shelter lighting system is designed to illuminate the advertisement and is not effective method for lighting the facility.

References

- Dingus, T.A, Klauer, S. G., Neale, V. L., Petersen, A., Lee, S. E., Sudweeks, J., Perez, M. A., Hankey, J., Ramsey, D. Gupta, S., Bucher, C., Doerzaph, Z. R., Jermeland, J. and Knipling, R. R., "The 100-Car Naturalistic Driving Study, Phase II – Results of the 100 Car Field Experiment", National Highway Traffic Safety Administration, Washington, D.C., April 2006, DOT HS 810 593, April 2006
- Johnston, A. W. and Cole, B. L., "Investigations of Distractions by Irrelevant Information", Australian Road Research, 6(3), 2-23, 1976
- Lee, S. E., Olsen, E. C. B., and DeHart M. C., "Driving Performance in the Presence and Absence of Billboards", Foundation for Outdoor Advertising Research and Education, 2003
- Lee, S. E., McElheny, M. J. and Gibbons, R.B., "Driver Performance and Digital Billboards", Foundation for Outdoor Advertising Research and Education, 2007
- Luoma, J., "The Acquisition of visual Information by the driver: Interaction of Relevant and Irrelevant Information", Central Organization for Traffic Safety: Helsinki Finland.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 31, 2008

A handwritten signature in black ink, appearing to read 'R. Gibbons', written over a horizontal line.

Dr. Ronald B. Gibbons