Roadside Advertising and Driver Distraction – Recent Research

Presented to AASHTO SCOHTS/SCOTE

by

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Research - Last 5 Years

- Since NCHRP 20-7 report (2009), 11 new studies completed.
  - USA
  - Australia
  - Canada
  - England
  - Israel
  - Norway
  - Sweden

- I will provide a VERY brief review of 8 of these, and then summarize my view of what’s happening.
Sponsorship and Methods

- Study sponsorship:
  - Government agencies/contractors
  - Insurance companies
  - University grant or self-funding

- Methods include:
  - Lab studies - primarily simulation
  - On-road quasi-naturalistic
  - Web surveys of crash-involved drivers
  - Statistical analysis of crashes (before/after with controls)
  - Critical reviews of literature and existing guidelines
An example of today’s simulation
Spoiler Alert: The Takeaways

- Roadside advertising signs (primarily digital) are detrimental to driver attention - they distract from the driving task.

- When the driving task is demanding, or when unexpected events occur, this distraction reduces a driver’s ability to respond in a timely way.

- In simulator studies, drivers fail to see imminent hazards, and crash into vehicles ahead that stop short.

- Recent research shows that distractions from outside the vehicle are of greater concern than those inside.
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The Research
Divekar, et al, 2013*

UMass, Amherst

Peer reviewed - TRB.

1/3 of distraction crashes caused by sources outside the vehicle.

Of these, digital billboards stand out because of their brightness and changing imagery.

This simulator study compared older to younger drivers, with in-vehicle vs. outside-the-vehicle distractors.

As expected, experienced drivers were much less likely to take long glances at distractors inside the vehicle.

Surprisingly, experienced drivers were just as likely as novice drivers to take long glances at the billboards, at the cost of identifying potential hidden hazards and seeing exposed moving threats.
England

- Chattington, et al. 2009*
  - TRL for Transport for London
    - Significant detriments in drivers’ visual behavior and driving performance with both static and video billboards.
    - Results support and extend findings of prior studies of driver distraction by advertising.
    - Advertising sign distractions adversely affected speed control, braking, and lane keeping.

- Young, et al. 2009*
  - Brunel University; grant from insurance fund; published
    - “We must emphasize the persuasive overall conclusion that advertising has adverse effects on driving performance and driver attention.”
Sweden

- **Dukic, et al, 2012***
  - Swedish Road Safety Institute (VTI) for the Government; published
  - Quasi-naturalistic: drivers passed digital billboards and other signs; did not know study purpose
    - Drivers had significantly longer dwell time, + more and longer fixations on billboards than any other signs.
    - Government chose to remove all DBBs at end of trial period
A Sign in the Swedish Study
Norway

- Backer-Grøndahl & Sagberg, 2010*
  - By Government research institute; presented
  - Web survey of >4000 crash involved drivers
    - Separated at-fault from not-at-fault drivers
    - Drivers selected from a list of possible causes.
    - Most frequent – conversations with passengers; children in back seat.
    - Highest relative risk – billboards; searching for addresses
Gitelman, et al., 2010*

For the National Roads Authority; presented

Peer reviewed, crash study on busy highway.

At control sites (billboards visible throughout) crash numbers unchanged.

At treatment sites (billboards visible “before” but covered “after,” crashes declined dramatically:

- Total crashes reduced by 60%
- Injury and fatal crashes reduced by 39%
- Property damage crashes reduced by 72%
Milloy & Caird, 2011*

University of Alberta; published in edited book

Causal relationship between video billboards and crashes into lead vehicle due to delayed driver response.

Authors believe real-world problem may be worse because:

- Study not conducted at night, when DBB distraction would be worse.
- Simulator can’t reproduce brightness levels of actual signs.
Australia

- Roberts, et al., 2013*
  - By ARRB for the Government

Main conclusions:

- Movement, changes in luminance *involuntarily* captures attention.
- Info of interest captures attention to detriment of driving performance.
- Particular problem for inexperienced drivers.
- In demanding situations, safety consequences may be significant.
- Drivers’ eyes off the road for 2 sec + further reduces safety.
- Roads with irrelevant visual clutter make it difficult to extract important information, especially for older drivers.

- *Studies show convincingly that roadside advertising is distracting and may lead to poorer vehicle control.*
Conclusions

- Every study in the past 5 years has produced consistent findings – that roadside billboards, especially digital and video, cause significant levels of driver distraction.
- These distractions result in poorer speed control and lane positioning, and may increase crashes in demanding situations when unexpected events occur.
- Roads with high visual clutter make it hard to extract critical driving information – especially for older drivers.
- Unlike in-vehicle distractions, experienced drivers are just as susceptible to such distractions and adverse behaviors as are young, novice drivers.
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Further Information

- The research compendium has more detail about each of these studies, and full citations.
- All of the cited studies can be made available to you upon request.
Questions?

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