Impacts of Digital Advertising Billboards on Traffic Safety

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UTC Conference for the Southeastern Region, Orlando, FL
April 4-5, 2013
• Investigate links between Advertising Billboards-Distraction-Traffic Safety Risk

• Synthesis of studies on billboard advertising and traffic safety

• On-going efforts to address issue at UAB and FIU
• Static billboards
  • the oldest form of mass media
  • 400,000 in US alone

• Advantages:
  • relatively low entry and operating costs
  • ability to appeal to the local market
Utilize light-emitting diode (LED) technology to provide vivid displays that can be updated every few seconds using computer input.

- Fast growing market
- 4,000 in US

Advantages:
- Single board can advertise to far more clients than a traditional board
- Clients can update their advertisements frequently, and
- Targeted messaging
• Brightness and contrast with surroundings
• Messages changing suddenly
• Large, imposing sizes
• Realistic imagery
• No driver acclimation with message
• Potential for message sequencing
• Potential for interactivity with driver
RESEARCH METHODS

• Meta-analysis studies
• Crash studies of historical trends
• Laboratory studies
• Naturalistic studies of driving behavior
NOTABLE RECENT META-ANALYSIS STUDIES AND FINDINGS

- Farbry et al., 2001
- Wallace, 2003
- Coetzee, 2003
- Birdsall, 2008
- Wachtel, 2009
- Molino et al., 2009 ...

- **Meta-analysis studies** confirmed an association between crash rates and billboards at intersections
Examples include:

• Smiley et al., 2005
• Tantala and Tantala, 2010
• Yannis et al., 2012 ...

• Most crash studies involving statistical analyses of historical data near DBB locations reported no statistically significant relationship with crash occurrence
Examples include:

• Young and Mahfoud, 2007
• Bendak and Al-Saleh, 2010
• Edquist et al., 2011
• Divekar et al., 2012
• Marciano and Yeshurun, 2012 ...
Laboratory studies confirmed that the presence of DBBs decreased driver control, increased mental workload, and increased response time.

- Driver response to road signs delayed by 0.5-1 sec with advertising billboard presence.

- DBBs caused drivers to be less observant of stopping cars ahead of them, and contributed to vehicle drifting into adjacent lanes.
Examples include:

- Akagi et al., 1996
- Kettwich et al., 2004
- Beijer et al., 2004
- VA Tech Transportation Institute, 2007
- Lee et al., 2007
- Ballidis, 2012...
Naturalistic studies reported mixed findings:

- Some concluded that there was no substantial distraction caused by the advertising signs, and that gaze duration towards signs decreases as driving complexity increased.

- Other studies provided evidence of increased number of glances per sign and longer gazes in the presence of DDBs compared to static counterparts.
LITERATURE REVIEW CONCLUSIONS

• Overall, the literature synthesis suggests that there is evidence of correlation between DDBs and increased driver distraction.

• However, local conditions, experimental settings, and other factors may play a role in the actual impact that advertising DBBs have on traffic safety.

• Existing research is limited due to a lack of standardized methods and practices, data reliability, appropriate assumptions, relevant hypotheses, and objective intentions.
DIGITAL ADVERTISING BILLBOARDS AND DRIVER DISTRACTION STUDY

• Project funded by the National Center for Transportation System Productivity and Management (NCTSPM, the Georgia Tech-led UTC)

• UAB and FIU Partnership with support from ALDOT and FDOT
Multi-state and multi-facet approach

• State-of-Practice-Synthesis
• Epidemiological Study
• Survey of Road Users
• Driving Simulator Study
STUDY TASKS

- **Epidemiological Study:**
  Analyze crash records from AL and FL and utilize appropriate statistical methods to examine the correlation between crash location occurrence and proximity to digital advertising billboards.

- **Survey of Road Users:**
  Collect and analyze survey data on road users’ perceptions and attitudes related to electronic and static billboards.

- **Driving Simulator Study:**
  Study driving behaviors in various roadway settings with and without the presence of digital billboards in a driving simulator environment.
ACCOMPLISHMENTS TO DATE

• Formed Project Advisory Committee
• Completed State of Practice Synthesis
  • Produced document summarizing findings
• Processed IRB approvals
• Developed and tested user survey instrument
• Constructed driving simulator scenarios
  • Produced document summarizing driving simulator protocol
• Funded 3 graduate students (2 in Civil Engineering; 1 Psychology)
• Technology Transfer
QUESTIONS AND COMMENTS