

Timing Boundaries	Average	Maximum	Minimum
Minimum Exposure Dwell Time (sec) ¹	7.32	10	4
Maximum Transition Twirl Time (sec) ²	2.16	4	1

Source: NAHBA 1999 Conference.

1. *Minimum Exposure Dwell Time:* For billboards that change messages, (e.g., tri-vision sign or CMSs), the exposure time can be defined as the minimum amount of time, in seconds, that a message must be shown. Some minimum exposure times have been derived from analytical calculations (based on speed limit and the number of faces of a billboard that can be seen) while other minimum exposure times have come in the form of recommendations from outdoor advertising suppliers or have been based upon engineering judgment.
2. *Maximum Transition Twirl Time:* The transition time is the amount of time, in seconds, that is required for a billboard (such as an EBB or tri-vision sign) to automatically change messages. Many states have set a maximum transition time for this change. The maximum was originally determined by taking into account the mechanical constraints of older tri-vision signs and attempting to limit the amount of visual distraction caused by a sign's transition. Due to advances in technology, transitions executed by a full-motion video billboard are virtually instantaneous.

Electronic Sign Data. In early February 2001, NAHBA asked its membership to answer four questions regarding EBBs. One question relevant to this research is: "Do you have a definition of an electronic sign?" Of the 20 responses that were received, five states had a definition, 14 did not have a definition, and one state was in the process of rewriting its definition.

2.2.5 State Outdoor Advertising Regulations

A review of statutes was conducted to identify state prohibitions on specific characteristics of signs. This review is presented in Appendices B and C. The results indicate, in part, that of 42 states:

- Thirty-six states had prohibitions on signs with red, flashing, intermittent, or moving lights,
- Twenty-nine states prohibited signs that were so illuminated as to obscure or interfere with traffic control devices, and
- Twenty-nine states prohibited signs located on interstate or primary highway outside of the zoning authority of incorporated cities within 500 ft of an interchange or intersection at grade or safety roadside area.

Additional information on other sign characteristics includes insufficient shielding of light, timing limits, and sign location relative to traffic control devices.

2.2.6 Concerns about Electronic Billboards

Numerous states have attempted to identify a relationship between EBBs and safety by using traffic conditions as a surrogate measure. The states of Nevada, Utah, Texas, New York, New Hampshire, and Massachusetts reported no evidence of increased traffic safety problems after the installation of electronic information displays in their city centers and along their highways. Additionally, five state DOT personnel were asked if a crash relationship with EBBs existed in their states; the responses were that a relationship between crashes and EBBs was not identifiable. However, one belief is that EBBs are typically on congested roadways where drivers have time to look at the sign, so it is difficult to determine if the EBBs cause crashes, let alone traffic congestion.

2.3 Reports on Billboards and Safety

Determining the effect of roadway commercial advertising billboards on safety is a difficult endeavor for several theoretical and methodological reasons. First, crash frequency is often used as a measure of safety, yet crashes occur relatively infrequently, so changes in frequency may be subtle and are not easily attributed to particular factors. In addition, distraction effects may interact with other factors, such as weather. Furthermore, crash