

# Sign and Billboard Lighting



Billboards, message boards, and signs along roadways are located, designed and lighted to maximize driver's attention. What better way to get peoples' attention during hours of darkness than to bathe the message face with excessively bright or flashing light or to have it displayed on a giant animated TV screen? But there's a time and a place for everything. Having such visual blight in a residential zone or use can spoil residents' quality of life. Similarly, having such a distraction on a limited-access highway near exit or entrance ramps or merging lanes should be questioned from a safety point of view. Having a sign or billboard lighted all night can be a waste of energy, an environmental blight, a visual eyesore, and a creator of unnecessary sky glow. It's a big price to pay for the few drivers who might see the message after, say, midnight.

What's the solution? In addition to those responsible for sign lighting using common sense, municipalities need to have an ordinance in place that regulates what kinds of lighted signs and billboards will be permitted where in the community, what kinds of lighting will be permitted, how glare and light trespass is to be controlled and at what time of night and how the lighting is to be dimmed or extinguished.

**Where** – Since the use of lighted billboards and signs cannot be denied by the municipality, the regulations should specify in what zones or districts they will be permitted. As an example, their use could be limited to commercial, industrial, institutional zoning districts. Within those districts their use could be prohibited where the message face is visible from a residential use or within 400 feet of a residential use. Their use might be prohibited in environmentally sensitive areas or near astronomical observatories. Their use within 1,000 feet of a limited access highway interchange or merging lane location could be prohibited.

**What** – Many conventional billboards and signs are lighted from the bottom of the sign and aimed up toward the sign. While this is typically done in the name of convenience of the folks who maintain the lighting, such an arrangement creates considerable sky glow caused by the light that reflects up off the sign face and light that reflects off the sign face and into the air above. To avoid the consequences of that stray and reflected light, the ordinance could consider the following language:



Bottom-Lighted  
Billboard in Fog



Top-Lighted Sign  
Keeps Light on Face



Unshielded  
Glare Sources



Glare-Free  
Top-Lighted Sign

"Externally illuminated billboards and signs shall have luminaires mounted at the top of the billboard or sign and aimed downward. The luminaires shall be designed, fitted and aimed to shield the lamp and its internal reflective surfaces from off-site view and to place the light output onto and not beyond the sign or billboard face. Lighting shall be by linear fluorescent or linear LED unless it can be demonstrated to the satisfaction of the Municipality that equal or superior results with respect to glare, light trespass and light pollution control can be achieved with an alternative source"

To control the brightness of the sign, especially in or near residential and environmentally sensitive venues, consider requiring the following language:

"At no point on the face of the sign or billboard and at no time shall the vertical illumination exceed 0.3 footcandles above ambient as measured at a height of 5' at the desired billboard-to-viewer distance. For Internally illuminated signs, they shall have a dark field and light message and the aggregate output of the light sources shall not exceed 500 initial lamp lumens per square foot of sign face per side. Channel letter signs shall have dimming capability to allow adjustment of sign brightness when required by the Municipality to accommodate local ambient conditions. Rotating, traveling, pulsing, flashing or oscillating light sources, lasers, beacons, searchlights or strobe lighting shall not be permitted. The use of highly reflective signage that creates nuisance glare or a safety hazard shall not be permitted."

**LED Message Boards** - LED, solid-state, electronic or digital billboards and signs, as they are variously called, present a particular problem because their message changes at short intervals and typically high brightness. Particularly in residential areas with low ambient lighting, the constant pulsing of the illumination from the sign into the surround from bright to dark can be extremely disconcerting. Allowing conventional signs to be converted to digital or approving new sign requests should require a building permit application and or special-exception Zoning Hearing Board review, with major emphasis placed on the negative effects of driver distraction and residential light-trespass blight.

**Ordinance Language** - When creating a new LED ordinance or upgrading a conventional sign ordinance to cover LEDs, consider the following additional ordinance requirements: Static message or image shall last no less than 8 seconds. Maximum transition time between successive static messages shall be 1 second and blending of static messages shall not be permitted. In the event of a malfunction, a default mechanism shall freeze the message in one position. At no point on the face of the billboard during hours of darkness shall the luminance be in excess of 200 nits (cd/m<sup>2</sup>). (In high ambient brightness districts this number could be increased to 300 nits. In rural, low ambient brightness locations, the requirement could be reduced to 100 nits). The brightness reduction shall be automatic and be in effect from 30 minutes after sunset to 30 minutes before sunrise. An outdoor advertising LED message board shall be separated a minimum distance of one thousand two hundred (1,200) feet from any other outdoor advertising LED billboard. An ordinance requirement should be considered that sign owner shall agree to further reduce sign brightness during hours of darkness if complaints are received from drivers or residents.

Short of not allowing lighted billboards and signs, the next best way of controlling them is to require that lighted signs and message boards be extinguished at an appropriate hour. Consider the following language: "Off-premises message boards and signs shall be extinguished automatically by a programmable controller, with astronomical control and spring or battery power-outage reset, by no later than 11:00 each evening until dawn, except that signs for establishments (not companies) that operate or remain open past 11:00 p.m. may remain lighted no later than ½ hour past the time of the close of the establishment."

**Submission Requirements** - To assure that the municipality is getting what has been promised by the installer, the following language should be considered for externally illuminated signs and billboards: "Applications for the lighting or relighting of signs and billboards shall be accompanied by a point-by-point plot of initial vertical illuminances on the sign or billboard face, catalog cuts of proposed lighting fixtures, any glare reduction devices and a description of lamps, mounting locations, aiming angles, proposed hours of operation and method to be used for automatically extinguishing the lighting by the required or proposed hour." For digital signage statistical evidence (sign face luminance plot with the sign in the all white mode).

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For additional information:

[Sample Ordinance Language for Digital Message Boards](#) (PDF file)

[Digital Billboard Recommendations and Comparisons to Conventional Billboards by Ian Lewin Ph.D., FIES, L.C.](#)

(84 KB PDF file) "Digital billboards operating at the luminance levels recommended in this report produce much fewer lumens into the night sky than conventional bottom mounted lighting systems."

[Information Sheet No. 35 from IDA on Billboard Lighting](#) (PDF file)

