# Criteria for Regulating Off-Premises Commercial Electronic Variable Message Signs (CEVMS) in New York State

Unlike conventional static billboards, Commercial Electronic Variable Message Signs (CEVMS) have the ability to constantly convey different information to motorists, thereby increasing driver curiosity. They also have the potential to attract increased attention through their brightness and temporal changes of light.

The following are statewide minimum criteria for regulating off-premises CEVMS in New York State; local ordinances will govern if they are more stringent.

CEVMS that change advertising copy once in a 24-hour period, or less frequently, will be considered static signs and will be treated like conventional billboards with the exception that the brightness criterion contained in this document will be applied to all CEVMS.

In addition to the criteria contained in this document, CEVMS are subject to the provisions contained in 17 NYCRR Part 150 and all other applicable Federal and State regulations and agreements regarding advertising signs adjacent to highways. The purpose of these criteria is to supplement existing requirements for conventional billboards to consider the unique attributes of CEVMS.

### Minimum Duration of Message = 8 seconds\*

# \*If accident rates increase at a CEVMS location and NYSDOT has a reasonable engineering basis that the CEVMS was a contributing factor, NYSDOT will revoke existing CEVMS permits for all locations and issue new permits with a longer minimum message duration time.

Studies have shown that it takes at least six seconds to read and comprehend a billboard. NYSDOT believes eight seconds is a more appropriate minimum static time due to the extra complexity involved with processing an electronic medium.

#### **Transition Time = Instantaneously**

Unlike tri-vision type billboards, which require time for the components comprising the sign face to physically change, CEVMS have the capability to change instantaneously. Given that the change of faces is one of the elements which can lead to motorist distraction, especially among older drivers, we want to minimize this distraction as much as possible.

Spacing = If more than one CEVMS sign face is visible to the driver at the same time on either side of the highway, the signs must be spaced at least 2500' apart on controlled access highways, and at least 300' apart on other types of highways

# \*If accident rates increase at a CEVMS location and NYSDOT has a reasonable engineering basis that the CEVMS was a contributing factor, spacing requirements will be revised prospectively for all new installations.

Any distraction to a driver is inherently problematic, and allowing a motorist to see face changes on two different CEVMS simultaneously, or sequentially, may be even more distracting than a face change on a single sign. As such, signs should be spaced so that a driver is not influenced by more than one CEVMS at a given moment.

## Maximum Brightness = 5,000 cd/m<sup>2</sup> (daytime), 280 cd/m<sup>2</sup> (nighttime)\*

## \*If accident rates increase at a CEVMS location and NYSDOT has a reasonable engineering basis that the CEVMS was a contributing factor, NYSDOT will revoke existing CEVMS permits for all locations and issue new permits with a revised maximum brightness.

The brightness of CEVMS is not only potentially distracting due to its ability to attract increased attention, but may also create problems with dark adaptation among older drivers. In order to minimize these dangers, the brightness of this technology should be constrained such that CEVMS do not appear brighter to drivers than existing static billboards.

To this end, NYSDOT engaged the services of the RPI Lighting Research Center (LRC) to perform measurements of existing static billboards and two existing CEVMS located in the city of Albany. The LRC's field work, combined with computer simulations, found that the luminance of a conventional billboard is not likely to exceed about 280 candelas per square meter (cd/m<sup>2</sup>) during the nighttime (assuming typical lighting practice as represented by the Illuminating Engineering Society of North America and billboard industry recommendations). The nighttime luminances of the studied CEVMS in Albany fell below this level, with the exception of the off-highway reading for the eastbound sign. (The on-highway reading fell below the level.)

The daytime luminances measured by the LRC ranged from 540 cd/m<sup>2</sup> (purple) to 23100 cd/m<sup>2</sup> (white), with seven of the nine readings falling below 4200 cd/m<sup>2</sup>. The two readings taken of the studied CEVMS in Albany were 3810 cd/m<sup>2</sup> (yellow) and 4170 cd/m<sup>2</sup> (light green).

A review of billboard industry information online yielded the following information:

In general, 1,500 NITS provides readable text in outdoor daylight, while grayscale and outdoor video require up to 5,000 NITs for acceptable color depth. [Optec Digital Billboards]

Watch fire's second-generation LED billboards allow outdoor operators to choose between a superbright, super-vivid 7,500 NIT daytime setting for maximum impact or a setting as low as 5,000 NITS, which is appropriate in many situations and can save outdoor operators up to 40 percent on energy bills. [Watchfire Digital Outdoor] (Note: 1 NIT = 1 cd/m2)

Given the readings taken by the LRC, and the billboard industry's own literature, limiting the maximum nighttime brightness to 280 cd/m<sup>2</sup>, and the maximum daytime brightness to 5000 cd/m<sup>2</sup>, best meets the Department's goal. Our online search indicated that numerous municipalities around the country have codified 5000 cd/m<sup>2</sup> as the maximum daytime brightness for CEVMS.

Prohibited Locations = No special prohibitions/conventional billboard regulations apply, with the exception of adding a 500' prohibition around toll plazas on controlled-access highways\*

\*If accident rates increase at a CEVMS location and NYSDOT has a reasonable engineering basis that the CEVMS was a contributing factor, the prohibited locations will be revised prospectively for all new installations.

Much research has shown that it is important to not overburden drivers with too much additional information while they are engaged in the driving task. A 2006 report released by the National Highway Traffic Safety Administration (NHTSA) concluded that nearly 80 percent of crashes and 65 percent of near-crashes involved some form of driver inattention within three seconds before the event. A 2001 study by the University of North Carolina Highway Safety Research Center found different age groups appear to be distracted by different things, with drivers over age 65 more distracted by objects or events happening outside the vehicle.

A safety study conducted jointly by NYSDOT and FHWA did not expose any statistically significant increase in crashes at existing CEVMS sites on freeways and expressways. NYSDOT will continue to monitor crash rates at CEVMS sites in order to identify any negative trends.