Carson City Planning Division

108 E. Proctor Street
Carson City, Nevada 89701
(775) 887-2180 – Hearing Impaired: 711
planning@carson.org
www.carson.org/planning

MEMORANDUM

Planning Commission meeting of July 31, 2013

G-1

TO: Planning Commission

FROM: Lee Plemel, AICP, Planning Division

DATE: July 19, 2013

SUBJECT: **Community Center Sign Operational Plan (SUP-13-022)**

RECOMMENDED MOTION: "I move to approve the operational plan for the new Community Center sign as submitted by City staff, subject to a review by the Planning Commission in July 2014, at which time the Planning Commission may modify the operational plan to address any negative impacts from the sign operation."

DISCUSSION:
The Planning Commission approved a Special Use Permit on March 27, 2013, to allow the replacement of the existing Community Center sign with a new changeable message center display sign. As a condition of approval, the applicant (Carson City Parks and Recreation Department) is required to obtain approval by the Planning Commission of an operational plan for the sign, which shall address sign brightness, sign dimming at night, message transitions, and other sign animation parameters.

The purpose of this item is to obtain approval of the proposed sign operational plan ("Policy and Procedure"), which is attached. To meet the requirements of the condition of approval noted above, the plan includes the following sign operation standards:

1. Sign brightness and dimming at night – The sign brightness shall be no more than 0.3 foot-candles above ambient light, measured in accordance with the operational policies and procedures.

This standard addresses sign brightness during day and night, though brightness is generally only an issue during the nighttime. This standard is recommended by the International Sign Association (ISA). A publication from ISA on sign brightness is attached. The Planning Division has a luminance meter and will evaluate the appearance of the sign within the proposed parameters to report back to the Planning Commission.

2. Message hold times – The minimum message hold time shall be three seconds.

A minimum message hold time is intended to limit driver distraction from continuously moving or changing messages. Studies have shown that the mean driver glance time at digital billboards is less than one second. More information regarding driver distraction is provided in several

attached presentation slides from the ISA. City staff will provide video samples of various message hold times at the Planning Commission meeting.

3. Message transitions – Transition time between messages shall be a maximum of one second.

Maximum message transition times are intended to limit driver distraction from overly animated transitions, getting to the message quickly while allowing for some transition time for message fades, fly-ins, etc. City staff will provide examples of instant transitions and other transitions of less than one second at the Planning Commission meeting.

4. Video and animation – The policies and procedures allow the use of video and animation. However, it requires the Parks and Recreation Department to evaluate video and animation capabilities and parameters and bring back further recommendations to the Planning Commission at the one-year review.

In addition to traditional text messages, the proposed message center sign is essentially a large video/computer screen capable of playing video and other animation. City staff understands that while video and animation can be powerful tools for conveying messages, overuse of video and animation can create a nuisance and be a distraction to drivers. The Parks and Recreation Department is proposing to evaluate the use of animation and video to bring further recommendations back to the Planning Commission in one year.

Since the City will have control of the sign content and animation, staff can immediately address any complaints or other issues that arise from the use of animation or any other sign operation parameters.

The proposed sign is under contract for construction and is expected to be completed by mid-September 2013.

If you have questions regarding this item, contact Lee Plemel at 283-7075 or lplemel@carson.org.

Attachments:
1. Sign operation Policies and Procedures
2. SUP-13-022 Conditions of Approval
3. Proposed sign photo-simulation
4. *Recommended Brightness Levels for On-Premise Electronic Message Centers* (by ISA)
5. Slides from ISA presentation: *Finding Common Ground* (by ISA)

POLICY AND PROCEDURE

Subject:	Carson City Community Center Electronic Message Center Operation Policy	**Index:**	
		Number:	
Effective Date: June 26, 2013	**Supersedes:** N/A	**Pages:** 2	**Approved by:**

1.0 PURPOSE:

This Electronic Message Center Operational Policy (EMCOP) sets the policy for a number of functions of the Electronic Message Center (ECM) at the Carson City Community Center, including sign brightness, sign dimming at night, message transitions, message hold times as well as animation and video parameters.

This policy was developed pursuant to Condition 5 of SUP13-022 approved March 27, 2013 by the Carson City Planning Commission on behalf of the Carson City Parks and Recreation Department:

> "The applicant shall obtain approval of an operational plan for the sign from the Planning Commission prior to operation of the sign, including sign brightness, sign dimming at night, message transitions, and other sign animation parameters. Such plan shall be submitted to the Planning Division at least 30 days prior to the Planning Commission meeting at which the plan is to be reviewed. The proposed sign shall have dimming capabilities."

Standards in this EMCOP are based, where possible, on the recommendations of the International Sign Association.

2.0 ORGANIZATIONS AFFECTED:

Carson City Parks and Recreation Department
All users of the Electronic Message Center

3.0 DEFINITIONS:

"Electronic Message Center" or "EMC" is defined as a device which uses a combination of lights, or lighted or unlighted panels which are controlled electrically and electronically to produce words, symbols, pictures or messages which may change within a given panel area.

"Illuminance" is defined as the total luminous flux incident on a surface, per unit area. Illuminance is the photometric quantity most closely associated with the perception of brightness and is a measurement of the intensity of light falling on a surface.

"Illuminance measurement distance" has units of feet and is defined by the value of the following equation, rounded to the nearest foot:

$$Illuminance\ measurement\ distance = 10\sqrt{sign\ area\ in\ square\ feet}$$

"Illuminance meter" is defined as a device which is able to measure illuminance in foot-candles, and is accurate to a minimum of two decimal places.

"Luminous flux" is defined as the measure of the rate of flow of luminous energy, evaluated according to its ability to produce a visual sensation.

"Message hold time" is defined as the period of time for which the text of a single message is visible, exclusive of transition time. Animation or video may be present within a single message, but the text of a message shall remain unchanged for the entire message hold time.

"Sign brightness over ambient light" is defined as the value obtained using the following procedure:
The illuminance of the EMC shall be measured with an illuminance meter with the EMC off, and again with the EMC displaying an all-white image over the entire area of the display. All measurements shall be taken perpendicular to the face of the sign at the illumination measurement distance. The difference between the white image state and the off state measurements shall be the "sign brightness over ambient light".

"Transition time" is defined as the time elapsed from the end of the complete display of one message to the full display of the next message.

4.0 POLICY:

Sign Brightness and Night Dimming:
Sign brightness over ambient light of the EMC shall be limited to 0.3 foot-candles over current ambient lighting, measured at the "illuminance measurement distance" defined in this plan at all times. The EMC shall be equipped with technology that automatically dims the electronic message center according to ambient light conditions. By utilizing a brightness standard which is measured relative to current ambient light conditions, and utilizing technology which automatically dims the electronic message center according to ambient light conditions, sign dimming at night will be inherent in the operation of the sign.

Message Hold Time:
The minimum message hold time shall be three seconds.

Message Transitions:
Transition time for messages shall be a maximum of 1 second.

Video and Animation:
This EMCOP recognizes that video and animation can be powerful tools for conveying messages. However, this EMCOP also recognizes that video and animation can be overused on EMC's, creating a nuisance. The Carson City Parks and Recreation Department will investigate various video and animation techniques on varying areas of the EMC for a period of one year from the date of adoption of this EMCOP to determine reasonable parameters for the use of video and animation which will facilitate effective communication without creating a nuisance. After the Carson City Parks and Recreation Department determines what those parameters are, they will return to the Planning Commission for review and possible approval of those parameters.

Operation During Urgent Situations:
Occasional operation of the EMC during urgent situations to convey to important information to the public is anticipated. When the operation of the EMC is controlled by the Fire Department, Health Department, Public Works Department or the Sheriff's Department to display information regarding urgent situations, the standards for sign brightness and night dimming, message hold times, message transitions as well as video and animation parameters may be disregarded.

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APR - 1
By Deputy
Carson City, Nevada

PLANNING COMMISSION
MARCH 27, 2013

NOTICE OF DECISION

A Special Use Permit application, SUP-13-022, was received from the Carson City Parks and Recreation Department (property owner: Carson City) to replace the existing Community Center sign on East William Street with a new changeable message center display sign at the same location including the same setback, and sign area, and increasing the maximum height of the sign from 16 feet to 20 feet, on property zoned Public Regional (PR), located at 851 E. William St, APN 002-181-01, pursuant to the requirements of the Carson City Municipal Code.

The Planning Commission conducted a public hearing on March 27, 2013, in conformance with City and State legal requirements, and approved SUP-13-022 based on the findings contained in the staff report and subject to the following conditions of approval:

CONDITIONS OF APPROVAL:

The following shall be completed prior to commencement of the use:

1. The applicant must sign and return the Notice of Decision within 10 days of receipt of notification. If the Notice of Decision is not signed and returned within 10 days, the item may be rescheduled for the next Planning Commission meeting for further consideration.

2. The applicant shall meet all the conditions of approval and commence the use (obtain and maintain a valid building permit) for which this permit is granted within twelve months of the date of final approval. A single, one-year extension of time may be granted if requested in writing to the Planning Division thirty days prior to the one-year expiration date. Should this permit not be initiated within one year and no extension granted, the permit shall become null and void.

3. All development shall be substantially in accordance with the development plans approved with this application, except as otherwise modified by the conditions of approval herein.

4. All improvements shall conform to City standards and requirements.

5. The applicant shall obtain approval of an operational plan for the sign from the Planning Commission prior to operation of the sign, including sign brightness, sign dimming at night, message transitions, and other sign animation parameters. Such plan shall be submitted to the Planning Division at least 30 days prior to the Planning Commission meeting at which the plan is to be reviewed. The proposed sign shall have dimming capabilities.

6. The Special Use Permit shall be reviewed by the Planning Commission one year from approval regarding the sign illumination (dimming) and message displays to determine if controls are adequate to minimize impacts to surrounding properties and motorists.

7. A banner is prohibited from being hung on the sign.

The following shall be submitted with or included as part of a building permit application:

8. The applicant shall submit a copy of the Notice of Decision, signed by the applicant and owner.

This decision was made on a vote of 7 ayes, and 0 nays.

Lee Plemel, AICP
Planning Division Director

LP:jmb

Mailed by: 4/2/13 By: RMT

ope of work: Manufacture and install new D/F 16 or 20 mm color LED message center, with black inet and white lower cabinet with black background and white show thru copy. Sheet metal e cover painted white.

ARSON COMMUNITY CENTER

SHEET 3

CALE	SALESMAN	DATE	DESIGNER
T TO SCALE	M. LIPKOWITZ	Sept 10, 2012 May 9, 2013	T. POLAND
		May 13, 2013	

MIT: $100,000.00, LICENSE CLASSIFICATION: C6, LICENSE NUMBER: 61029 EXP. 12/13

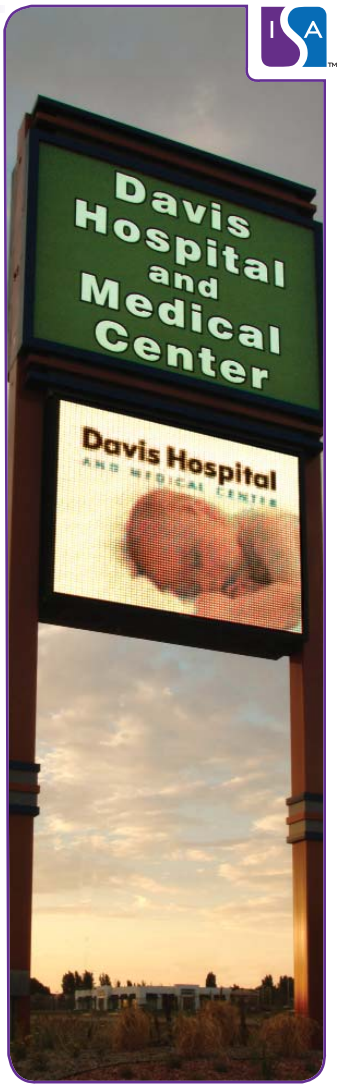
Custom Sign
2222 Mouton Drive
Carson City, NV. 89706
Ph. 775-884-1818

Recommended *Brightness Levels* for On-Premise Electronic Message Centers (EMC's)

ISA™ International Sign Association

A Compilation Summary with Extracts from Industry Reports • December 2010

Table of Contents



INTERNATIONAL SIGN ASSOCIATION

Introduction

Electronic Message Centers (EMC's)

One of the more interesting types of signage that is becoming increasingly popular is on-premise **electronic message centers**, or **EMCs**. You may have heard EMCs being referred to as changeable message displays or digital signs.

EMCs are *not* digital billboards, which advertise a good or service that is located away from where the sign is located. Rather, EMCs are digital signs that are located *on the premises* of the business, and that advertise goods and services that are provided at the location.

Digital billboard/off-premise sign advertising an automobile business away from where the sign is located

Electronic Message Center (EMC)/on-premise sign advertising an automobile business that is located at the place of business

There is often confusion regarding on and off-premise digital signs. However, EMCs and digital billboards have very distinct capabilities and purposes, each targets a specific audience and each has traditionally been treated under separate legal and regulatory regimes. For the purposes of this publication, *we are focusing solely and exclusively on EMCs.*

EMCs that are too bright can be offensive and ineffective. EMC brightness is an issue where sign users, the sign industry, and the planning community have a common goal: ensuring that EMCs are appropriately legible. We know the messages that these signs convey can be rendered unattractive and perhaps even unreadable if they are programmed too bright.

That's why many sign companies recommend to their customers that in order for these signs to be most effective, their brightness be set at such a level to be visible, readable and conspicuous.

In 2008, the International Sign Association (ISA) retained Dr. Ian Lewin of Lighting Sciences to help the industry develop scientifically-researched, understandable recommendations for EMC brightness. Dr. Lewin is a past chair of the Illuminating Engineering Society of North America (IES), and is greatly respected within the lighting field. His work for ISA was conducted with the input of experts within the sign industry. Dr. Lewin's full report can be found at www.signs.org.

As a result of this research, the recommended brightness level for on premise EMCs is 0.3 foot candles above ambient light conditions when measured at an appropriate distance. This is a lighting level that works in theory and in practice.

The research and the recommendations contained in this report pertain only to EMCs, not traditionally internally illuminated signs, such as these channel letter and neon signs below. EMC's use a different lighting technology than most of these types of signs, and as such the scientific approach differs.

You can rest assured that the information contained in this publication is relevant, appropriate and workable for determining EMC brightness levels.

We have provided six short steps to help guide the process and recommended statutory language. If you need further assistance, feel free to contact ISA at (703) 836-4012 to answer any of your EMC brightness questions.

EMCs and digital billboards have very distinct capabilities and purposes, each targets a specific audience and each has traditionally been treated under separate legal and regulatory regimes.

Executive Summary

ISA Electronic Message Display Brightness Recommendations

This summary has been developed to assist stakeholders concerned with development of brightness standards for large-format, electronic displays used for on-premise sign applications. This summary comprises:

1) an overview of the importance of ensuring appropriate brightness,
2) technology utilized to ensure appropriate brightness,
3) recommended brightness standards, and
4) brightness measurement methodology.

1. Overview of the importance of ensuring appropriate brightness.

Electronic displays that are too bright can be offensive and ineffective. There are significant advantages to ensuring than an electronic display is not overly bright. These advantages include:

- Conservation of energy
- Increased life expectancy of the electronic display components
- Building goodwill with the community
- Ensuring the legibility of the display

It is in the best interest of all stakeholders to ensure that electronic displays are sufficiently bright to ensure clear legibility, while at the same time avoiding a display that is overly bright.

2. Technology utilized to ensure appropriate brightness.

Most electronic displays are designed to produce sufficient brightness to ensure clear legibility during daylight hours. However, daytime brightness settings are usually inappropriate for nighttime viewing. The following general methods are used to dim an electronic display for appropriate nighttime viewing:

1. ***Manual Dimming.*** Using this method, the sign operator dims the display in response to changing ambient light conditions.

2. ***Scheduled Dimming.*** Sunset-sunrise tables allow an electronic display to be programmed to dim at the same time that the sun sets and rises. This method is generally acceptable, but is more effective when used as a backup to automatic dimming controls capability, such as photocell technology.

3. ***Photocell Technology.*** An electronic display that utilizes photocell technology can automatically dim as light conditions change. A photocell sensor alerts the display to adjust brightness according to ambient light conditions.

Most electronic displays are designed to produce sufficient brightness to ensure clear legibility during daylight hours. However, daytime brightness settings are usually inappropriate for nighttime viewing.

3. Recommended brightness standards.

ISA commissioned Dr. Ian Lewin of Lighting Sciences, Inc. to develop brightness criteria for on-premise electronic displays. Dr. Lewin is a leading lighting expert with over thirty years experience in the lighting industry.

Dr. Lewin recommended the development of brightness criteria based on the Illuminating Engineering Society's (IES) well-established standards pertaining to light trespass, IES Publication TM-11-00. The theory of light trespass is based on the concept of determining the amount of light that can spill over (or "trespass") into an adjacent area without being offensive.

As a result of his research, Dr. Lewin recommended two different brightness settings based on whether the EMC was located in an area of high or low ambient light. After field testing and utilizing Dr. Lewin's recommendations, it was determined that using the more conservative recommendation is appropriate in areas of both low and high ambient light. In order to simplify Dr. Lewin's recommendations, and to take a more reasonable approach to ensure that EMC's are sufficiently visible but not overly bright, it is recommended that EMC's not exceed 0.3 footcandles over ambient lighting conditions when measured at the recommended distance, based on the EMC size.

...it is recommended that EMC's not exceed 0.3 footcandles over ambient lighting conditions when measured at the recommended distance, based on the EMC size.

4. Brightness measurement methodology.

There are two generally accepted measures of brightness in the sign industry; illuminance and luminance. Illuminance, the preferred method, is a measure of the amount of light intercepting an object at a given distance from a light source and is measured in footcandles or its metric equivalent, lux. Illuminance can be measured with a footcandle meter (also know as a luxmeter), which are relatively inexpensive ($100-1000) and commonly available. The footcandle meter should be accurate to two decimal points for accurate measurements. The second method, luminance, is an absolute measure of the amount of brightness that is being emitted from a light source and is usually measured in candelas per square meter, also known as "nits." Luminance can be measured by use of a "nit gun", which are expensive (~$3,000) and difficult to procure. The preferred method of measurement is illuminance using a footcandle meter because a measure of luminance fails to account for ambient light conditions.

Recommended Legislative Language

1. **Electronic Message Center (EMC) Criteria:** The illumination of an EMC shall conform with the criteria set forth in this section.

A. **EMC Illumination Measurement Criteria:** The illuminance of an EMC shall be measured with an illuminance meter set to measure footcandles accurate to at least two decimals. Illuminance shall be measured with the EMC off, and again with the EMC displaying a white image for a full color-capable EMC, or a solid message for a single-color EMC. All measurements shall be taken perpindicular to the face of the EMC at the distance determined by the total square footage of the EMC as set forth in the accompanying Sign Area Versus Measurement Distance table.

B. **EMC Illumination Limits:** The difference between the off and solid-message measurements using the EMC Measurement Criteria shall not exceed 0.3 footcandles.

C. **Dimming Capabilities:** All permitted EMCs shall be equipped with a sensor or other device that automatically determines the ambient illumination and programmed to automatically dim according to ambient light conditions, or that can be adjusted to comply with the 0.3 footcandle measurements.

D. **Definition of EMC:** A sign that utilizes computer-generated messages or some other electronic means of changing copy. These signs include displays using incandescent lamps, LEDs, LCDs or a fliper matrix.

SIGN AREA VERSUS MEASUREMENT DISTANCE

AREA OF SIGN sq. ft.	MEASUREMENT Distance (ft.)
10	32
15	39
20	45
25	50
30	55
35	59
40	63
45	67
50	71
55	74
60	77
65	81
70	84
75	87
80	89
85	92
90	95
95	97
100	100
110	105
120	110
130	114
140	118
150	122
160	126
170	130
180	134
190	138
200	141
220	148
240	155
260	161
280	167
300	173

** For signs with an area in square feet other than those specifically listed in the table (i.e., 12 sq ft, 400 sq ft, etc), the measurement distance may be calculated with the following formula:* Measurement Distance = $\sqrt{\text{Area of Sign Sq. Ft. x 100}}$

Six STEPS:
EMC Brightness Levels

How to Measure the Brightness of an Electronic Message Center (EMC)

STEP 1

OBTAIN AN ILLUMINANCE METER.

Purchase or otherwise procure an illuminance meter. Most city/county traffic departments have an illuminance meter, which are also referred to as lux or footcandle meters (lux is the metric measure of illuminance; footcandles is the English measure of illuminance). The illuminance meter must have the ability to provide a reading up to two decimal places and must be set to read footcandles. It is preferred to have an illuminance meter with a screw-mount that allows the sensor to be mounted on a tripod. A tripod ensures that the highly sensitive sensor is held perfectly still; otherwise it may be difficult to obtain an accurate reading.

If you do not have an illuminance meter, the Konica Minolta T-10 is a high quality illuminance meter that works well. However, other less expensive illuminance meters may also provide adequate results. The International Sign Association has no affiliation with Konica Minolta.

STEP 2

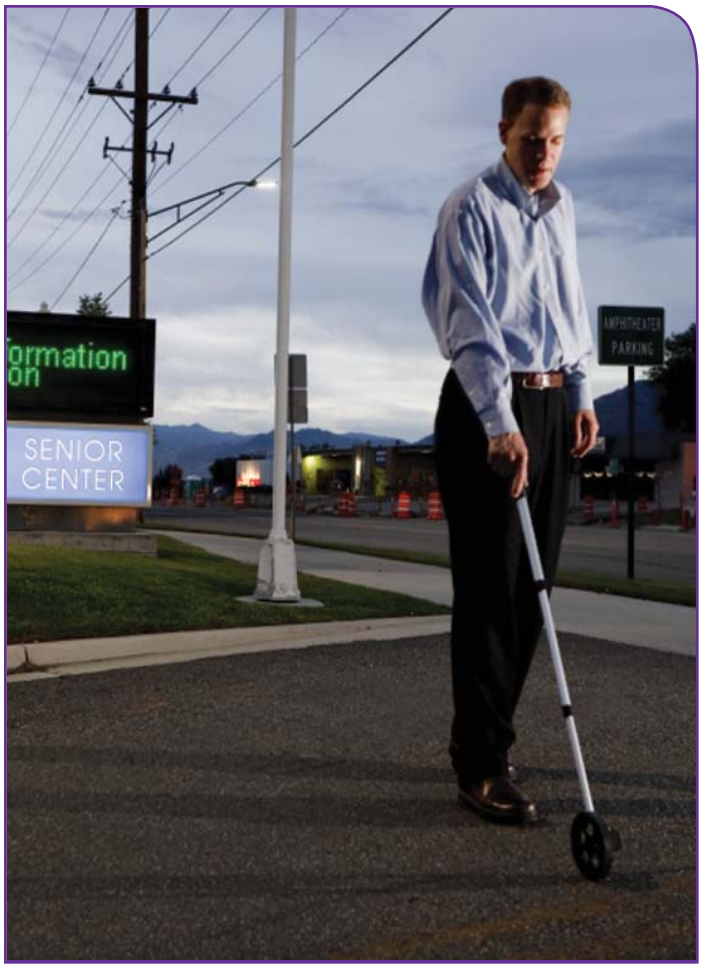
DETERMINE SQUARE FOOTAGE.

Determine the square footage of the face of the electronic message sign (EMC) by multiplying the height and width of the EMC. This information may be available in a permit application, or can be determined by physically measuring the height and width of the EMC. Do not include the sign face square footage attributable to any additional static signs associated with the EMC (if applicable).

STEP 3

DETERMINE THE MEASUREMENT DISTANCE.

Using the total square footage found in Step 2, look up the measurement distance in the table provided in the Recommended Legislative Language on page 6, to determine the distance to measure the brightness of the EMC. The distance should be measured perpendicular to the EMC sign face. The use of a measuring wheel is the most convenient way to measure the distance.



STEP 4

PREPARE THE DISPLAY FOR TESTING.

Ensure that the EMC is programmed to alternate between a solid white (or in the case of a monochrome display – the solid color of the display) message and a blank message. You may wish to have a requirement that the sign owner cooperate with testing by programming the EMC for testing upon written notice.

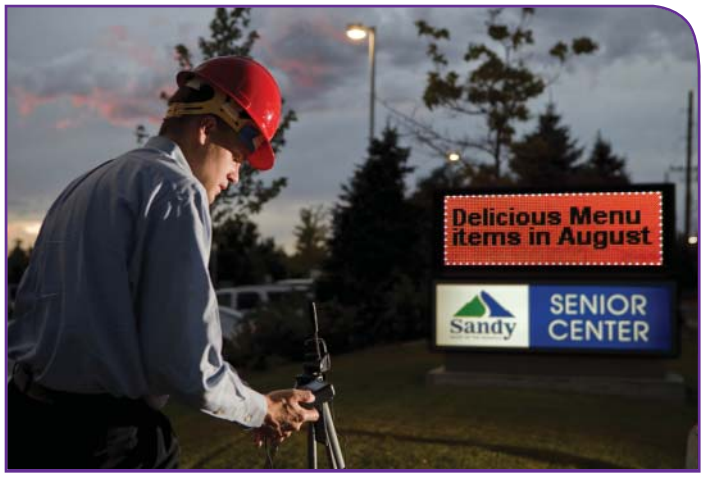
STEP 5

USE AN ILLUMANCE METER TO MEASURE THE BRIGHTNESS OF THE EMC.

Mount the sensor of your illuminance meter to a tripod and orient the sensor directly towards the face of the EMC at the measurement distance determined in Step 2.

STEP 5 [CONTINUED]

Ensure that the illuminance meter is set to measure footcandles up to two decimal places. As the display alternates between a solid white message and an "off" message, note the range of values on the illuminance meter. If the difference between the readings is less than 0.3 footcandles, then the brightness of the display is in compliance. If not, the display will need to be adjusted to a lower brightness level using the manufacturer's recommended procedures.



STEP 6

ENSURE THAT THE DISPLAY CAN ADJUST TO DIFFERENT AMBIENT CONDITIONS.

Inspect the sign to ensure that it incorporates a photocell or other technology to ensure that the display can adjust according to ambient lighting conditions.

As the display alternates between a solid white message and an "off" message, note the range of values on the illuminance meter. If the difference between the readings is less than 0.3 footcandles, then the brightness of the display is in compliance.

International Sign Association

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www.signs.org

Finding Common Ground

EMC and Digital Sign Issues

PRODUCED BY:

INTERNATIONAL SIGN ASSOCIATION

Common Concern #2

"The mere presence of these signs will distract drivers, and cause more accidents."

The Truth:

Studies show there is NO causal relationship between these signs and accident rates.

Distraction vs. Danger

Crash Data / Accident Analysis

Tantala Group: Five major studies from 2007 – 2010

- Each study analyzed crash data before and after deployment of digital billboards.
- More than 160,000 accident records in proximity to 69 digital billboard faces were analyzed
- Traffic counts at these boards total over 1 billion vehicles per year

Consistent Key Finding:

No statistical relationship between vehicular accidents and billboards. **Digital billboards are "safety neutral".**

Statistical Analysis of the Relationship Between On-Premise Digital Signage and Traffic Safety

H. Gene Hawkins, Jr., Ph.D., P.E.

- Associate Professor and Research Engineer, Zachry Department of Civil Engineering, Texas A&M University

Statistical Analysis of the Relationship Between On-Premise Digital Signage and Traffic Safety

Background:

- Study examined data over a four-year period at 130 locations in four states.

Key Finding:

- "We did not find a statistically significant impact."

Study Weblink:

- http://www.signs.org/GovernmentRelations/ResourcesforLocalOfficials.aspx

VTTI Study: "Driving Performance and Digital Billboards" - 2007

Key Facts:

- Participants drove in instrumented vehicle on a 50 mile loop in Cleveland
- Participants were not informed about true purpose of test
- Special equipment measured eye glances toward digital billboards and other comparison targets
- Goal: Measure duration of eye glances

VTTI Study: "Driving Performance and Digital Billboards" - 2007

Key Findings:

- The mean glance duration towards digital billboards was less than one second, both day and night
- In comparison: Texting = mean glance duration of 4.6 seconds during 6 second period.

Eye Glance Duration

Current FHWA Study

- Intent: Measure possible affects of digital billboards on driver attention, distraction and safety
- Approached research from a human factors perspective, much like Virginia Tech study
- There is no release of the FHWA research planned for the near future. FHWA staff members are reviewing comments from peer reviewers.
- Key Finding (via Freedom of Information Act):
  - Mean eye glance far less than 1 second