Clear Channel Outdoor

July 18, 2016

BY US MAIL AND EMAIL RBorrelli@dot.state.nv.us
Ruth Borrelli
Assistant Chief Statewide Utilities Right-of-Way
Nevada Department Transportation
1263 S. Stewart Street
Room 320
Carson City, NV 89712

Re: Update of industry position regarding previous written communications

Ruth,

The group of companies and individuals advocating for digital billboard regulations in Nevada, on behalf of the industry, submitted the attached letters to Jerry M. Hoover, then Assistant Chief Statewide Utilities Right-of-Way, Nevada Department Transportation. The October 2015 letters were submitted at or before two public workshops held in Sparks, NV and Carson City, NV.

February 11, 2015 working document
February 17, 2015
October 5, 2015 from CCO and Lamar separately
October 27, 2015

We request this communication and those documents to be part of the package of information sent to the Transportation Board.

These letters followed months of negotiations where relevant information in significant detail was conveyed directly to NVDOT. This information was challenged and questioned by the state staff. Ultimately the information provided was fully explained and verified with decisive in the field demonstrations. These two in the field lighting measurement demonstrations occurred in Reno, NV and in Las Vegas, NV.

With the passage of time since then, we would like to summarize clarify what our current position is relating to those negotiation points. Excluding one technical item in the October 5, 2015 letter mentioned below, all content in the letters remains and reflects the industry position.

Working document dated February 11, 2015 Re: CCO responses to recent language changes to NAC 410.350 presented by Jerry Hoover, NVDOT

In this document the industry group

- Details the historical events leading up to that date regarding the passage of AB 305 in 2013
- Comments on and refutes numerous changes made to the proposed language

Clear Channel Outdoor
7370 Dean Martin Drive Suite 407 Las Vegas, NV 89139
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Letter dated February 17, 2015 Re: Proposed CEVMS (Digital Billboard) Regulations

In this letter the industry group

- Refutes numerous changes to the proposed language
- Explanations and information provided to support the industry position

Letter dated October 5, 2015: Re: Comment to Proposed CEVMS (Digital Billboard) Regulations NAC 410.350 Sign construction: illumination / luminance; commercial electronic variable message signs. (NRS 410.400)

This was submitted at the October 6, 2015 public meeting in Sparks, NV. In this letter the industry group

- Objected to the lowering of the nighttime nit level ion the proposed language from 350 nits to 250 nits, if the foot-candle reading exceeds (0.3) foot-candles maximum from the pre-set distance. While the reasoning behind this position in the letter remains accurate, the industry has since backed off this request in the spirit of negotiations.
- The letter from CCO also details the in the field lighting measurement demonstrations conducted in Reno on March 24, 205 and in Las Vegas in April 2015.

Letter dated October 27, 2015: Re: Responses to Scenic Nevada document regarding digital billboards.

Re: Proposed CEVMS (Digital Billboard) Regulations NAC 410.350 Sign construction: illumination / luminance; commercial electronic variable message signs. (NRS 410.400)

This was submitted at the October 27, 2015 public workshop in Las Vegas, NV. In this letter the industry group

- Responds publicly, in technical detail and on the record to numerous, erroneous allegations made by Scenic Nevada in their document titled "Digital Billboards and Environmental Impacts." All erroneous allegations made by Scenic Nevada in their document were refuted.

In addition we provide additional attachments.

1 A comparison chart revealing the differences between on-premise signs not regulated by the state and off-premise signs which are regulated by the state and are the subject of the proposed language. These important distinctions are commonly deliberately blurred by the anti-sign industry in their efforts to confuse regulators and impose draconian operating standards.

2 A letter from Lamar outdoor dated October 5, 2015 submitted into the record at the October 6, 2015 public meeting in Sparks, NV

3 A statement regarding the number of off premise billboard faces, printed and digital by all OAAA member companies operating in Nevada.

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4 A chart depicting the specific ordinance requirements for digital signs in Clark County, Henderson, City of Las Vegas, City of North Las Vegas, City of Reno, City of Sparks and Washoe County

5 A chart of the surrounding western states with digital brightness levels, message duration, etc. (Arizona, California, Colorado, Idaho, New Mexico, Oregon and Utah)

In addition, the proposed changes that are a result of numerous negotiations are consistent with federal criteria. The changes proposed are consistent with the FHWA guidance memo on digital billboards, dated September 25, 2007.[1]

Thank you,

Adam Barthelmess

President, Las Vegas Division

Clear Channel Outdoor

C: Members of the State of Nevada, Transportation Board

Governor Brian Sandoval
Nevada State Capitol Building
101 N. Carson Street
Carson City, NV 89701

Lt. Governor Mark Hutchison
Nevada State Capitol Building
101 N. Carson Street
Carson City, NV 89701

State Controller Ron Knecht
Nevada State Capitol Building
101 N. Carson St. Suite 5
Carson City, NV 89701-4786

Frank Martin - District 1
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

[1] USDOT Federal Highway Administration Memorandum, Subject: Information: Guidance on Off-Premise Changeable Message Signs, dated September 25, 2007

Clear Channel Outdoor

Tom Skancke - District 1
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Len Savage - District 2
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Emil "B.J." Almberg, Jr. - District 3
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Clear Channel Outdoor
7370 Dean Martin Drive Suite 407 Las Vegas, NV 89139
Call 702.238.7200 / Fax 702.238.7266 / Visit ClearChannelOutdoor.com / Follow @CCOutdoor

CCO responses to recent language changes to NAC 410.350 presented by Jerry Hoover, NVDOT

February 11, 2015

Background:

The process began with the passage of AB 305 modifying NRS in late 2013, effective Jan 1, 2014. That language in part specifically authorized CEVMS signs. At the time the industry advocated for the adoption of brightness standards. Direction was given from staff not to include brightness language and instead it would be adopted at the policy level. While not ideal for the industry, no other options were practical.

In 2013 and since the industry previous submitted language changes to NAC 410.350, those have not yet been adopted. Again direction was given not to include brightness standards/ language. Along with those changes we attempted to provide education and information supporting them and overall explanation of digital lighting to staff. Several meetings occurred including CCO flying out their digital lighting expert to meet with Jerry Hoover at NVDOT in Sept 2014. After these discussions, no objections related to sign lighting or brightness were stated.

The previously proposed rulemaking by the industry, is a minor amendment to the existing regulations in that it simply amends the Administrative Code to specify existing operating procedures for CEVMS, which are already permitted under Nevada law, in accordance with the appropriate rule making procedures. Digital billboards are already permitted and regulated in the State of Nevada and these additional regulations will simply formalize the existing and long standing procedures for operation of these signs, in addition to ensuring that all off-premise digital signs are operated in accordance with Federal standards.

The recent changes presented by Mr. Hoover to NAC 410.350 are unnecessary and would serve to prohibit the operation of digital outdoor advertising signs in the state of Nevada by forcing them to appear so dim the displays would be rendered unreadable. We confidently believe the state of Nevada recognizes the many benefits provided to citizens from regulated, outdoor advertising signs along the roads of the state that can be seen.

The paradigm from which these proposed changes originate seems to ignore these basic facts

1. Commercial Electronic Message Boards (CEVMS) are clearly already permitted under NRS 410.400 and NAC 410:350.
2. There are over 5,500 off-premise digital billboards[1] in operation across the US in 43 states. We are unaware of any ongoing brightness compliance issues on the 1,200 that CCO operates or the 2,100 that Lamar operates.
3. Nearly 1,000 localities have digital billboards installed consistent with state and federal requirements.
4. There are currently over 100 off-premise digital billboards in operation in the state of NV, between Lamar and CCO alone, seemingly without incident.

Identifying the proposed changes by Jerry Hoover:

1 New terminology created relating to Disability glare, discomfort glare and glare. Strike entirely. Digital billboards operated in compliance with the industry standard brightness guidelines will not cause glare that compromises a drivers sight while operating a motor vehicle. The nighttime reflections of headlights in rear view mirrors are several times brighter yet no term has been created to describe it. The industry standard brightness guidelines have long proven their effectiveness and were based on an IESNA document TM-11-00 – Technical Memorandum on Light Trespass. This document addresses glare.

2 Insertion of language separating CEVMS signs from those regulated in the MUTCD. Maintained the suggested language in an updated industry document proposing changes to NAC 410.350.

3 Modifies the commonly accepted language regarding glare affecting a driver – revert to previous language

4 Section added regarding maximum luminance and new terminology of civil twilight. Strike entirely. Newly created term is unnecessary with the implementation of the industry standard brightness guidelines.

5 Section added with Nit limits proposed at 100 at night 3000 daytime. Strike entirely. Such a standard is inferior to the industry footcandle standard. The levels are unacceptable as they would serve to prohibit the operation of digital outdoor advertising signs in the state of Nevada by forcing them to appear so dim the displays would be rendered unreadable.

6 Section added regarding dimming capability. Maintained intent of suggested language.

7 Section added regarding different luminance levels for urban and suburban areas. Strike entirely. There is no need for two sets of brightness criteria as the 0.3 footcandle standard covers both scenarios. The industry standard maximum brightness language is so restrictive and comprehensive, it insures a CEVMs will never be too bight for conditions. This includes bright areas and dark areas, nighttime and daytime. Three components are required:

   a. The 0.3 foot candle standard language adopted, including a pre-set distance from which to measure (250 ft away for 14 x 48 nominal face size)
   b. An ambient light sensor to measure the brightness/darkness in the subject sign environment
   c. Dimming software to dim the sign as it gets darker out and to brighten the sign as it gets light out. This occurs unnoticed to the viewer.

8 Luminance definition added and terminology used. Strike entirely. When striking the inferior nit standard, the use of the term is no longer needed. An LED sign generates luminance at the source (measured in nits), but this raw source is not what the human eye sees from a distance. The human eye sees illuminance (measured in foot candles) from a point at a certain distance from the LED sign. Illuminance is greatly affected by ambient light and surrounding conditions.

Foot candles measure the variance from ambient light. This assures a government that the sign will not be too bright for conditions. At different parts of a day the ambient lighting can

be significantly different with clouds or fog. Conversely, the same can be true about nighttime conditions when an adjacent commercial lot turns on or off their parking lot lighting. Regulation using Nits merely sets a maximum and minimum level for day and night time conditions. This allows a sign to operate at significantly higher luminance than is needed, at times over the course of a 24 hour period. Using the foot candle standard will not allow the sign to be too bright under a variety of conditions.

9 Replace unacceptable nit standard with a more restrictive footcandle standard. Insert industry brightness standard utilizing footcandle measurement.

10 Combined definition of tri-vision and digital into "digital." Tri-vision signs may be mechanical but are not digital. Reverted to previous definition.

11 Conditioned state approved conversions to digital on not violating the HBA. Strike entirely. FHWA oversight on a states proposed changes can insure effective control is maintained.

12 Inserted hacking and unauthorized access language and combined with malfunction language. Separate unauthorized and malfunction topics. Maintained much of suggested language.

---

[1] From The Outdoor Advertising Association of America, effective January 1, 2015

Clear Channel Outdoor

February 17, 2015

BY HAND AND EMAIL
Jerry M. Hoover
NDOT
1263 S. Stewart Street
Carson City, Nevada 89512

Re: Proposed CEVMS (Digital Billboard) Regulations

Dear Mr. Hoover,

In light of the recent changes you proposed to NAC 410.350 with respect to the proposed CEVMS (digital billboard) regulations, we would like to clarify and emphasize the following points:

1) NDOT regulations (NAC 410:350) already allow CEVMS. The industry's proposed changes seek only to codify the operating standards currently being adhered to by OAAA member companies.

2) Lighting Standards. The maximum brightness limits you propose would completely render all existing and future digital billboards unreadable. One conclusion that can be drawn is that you were uninformed or unaware of the implications of such language from the practical standpoint of following the legislature's direction to adopt reasonable standards. .

   Clear Channel and the OAAA (Outdoor Advertising Association of America) recognized/member companies voluntarily adhere to recommended brightness criteria. This follows lighting standards established by the Illuminating Engineering Society of North America (IESNA).

   It states that lighting levels for commercial electronic variable message signs will not increase by more than 0.3 foot candles (over ambient levels) as measured using a foot candle meter, at a pre-set distance.

   In addition, OAAA recognized/member companies utilize a photocell on digital billboards so that the display will easily be seen by motorists under changing light conditions. Sophisticated dimming software constantly changes the brightness of the display in response to changing ambient lighting conditions. This insures a digital billboard will never be too bright for conditions day or night, urban or suburban.

   As a result, in the context of digital billboard regulation, there is no need for entirely new definitions or terms of art created for twilight and differing degrees of glare. A proper understanding of the nature of LED lighting and the industry proposed guidelines renders moot the need for different luminance level requirements in urban and suburban areas.

Clear Channel Outdoor
4945 Joule Street Reno, NV 89502
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3) 10% of Federal Highway funds. You verbally raised the issue about a potential loss of federal highway funds regarding billboard regulation. This scenario could only happen if the FHWA deemed the state did not have effective control, notified the state of such deficiency and the state took no action to remedy the deficiency.

We do agree, in general with a few of your suggested changes; regarding dimming capability, malfunction, MUTCD signs and unauthorized access.

In sum, we revert back to the proposed redline document previously provided to you. This rulemaking is a minor amendment to the existing regulations in that it simply amends the Administrative Code to specify existing operating procedures for CEVMS, which are already permitted under Nevada law, in accordance with the appropriate rule making procedures. We therefore strongly urge that you reject the alternative recommendations suggested by Scenic Nevada. Digital billboards are already permitted and regulated in the State of Nevada and these additional regulations will simply formalize the existing and long standing procedures for operation of these signs, in addition to ensuring that all off-premise digital signs are operated in accordance with Federal standards

Sincerely,

Susan Holshouser

President and General Manager

Reno Division

Bill Kurr

President and General Manager

Las Vegas Division

CC: Paul Saucedo
Britta Kuhn

Clear Channel Outdoor

October 5, 2015

BY HAND AND EMAIL
Jerry M. Hoover
Assistant Chief Statewide Utilities Right-of-Way
Nevada Department Transportation
Reno, Nevada

Re: Comment to Proposed CEVMS (Digital Billboard) Regulations NAC 410.350 Sign construction: illumination / luminance; commercial electronic variable message signs. (NRS 410.400)

Dear Mr. Hoover,

We would like to publicly thank you, your staff and the many people involved with crafting this language. The citizens of the state will be pleased to know of the thoroughness and the scrutiny that your department has used in vetting the proposed language.

We appreciate the opportunity to make these comments publicly, and on the record regarding the proposed changes to NAC 410.350

As you know, digital billboards, aka Commercial Electronic Variable Message signs ("CEVMS") have been permitted in the state of Nevada for many years under NRS 410.400 and NAC 410.350. There are currently over one hundred (100) off-premise digital billboards in operation in Nevada, between Lamar Outdoor Advertising ("Lamar") and Clear Channel Outdoor ("CCO") alone.

We have been engaged in the process of creating and promoting strict but fair regulation of digital signs before the passage of AB 305 in 2013. AB 305 amended NRS 410.400 and required regulations to be promulgated to address operational requirements for CEVMS.

There are over 6,100 digital billboards[1] in operation across the US in 43 states. We are unaware of any ongoing brightness compliance issues with the 1,200 digital billboards that CCO operates or the 2,100 digital billboards that Lamar operates. Furthermore, nearly 1,000 localities allow digital billboards that have been installed consistent with state and federal requirements.

The adoption of certain operating standards, by which the outdoor industry is currently adhering to, is a responsible option when those standards have proven to be effective. Adoption of operating standards at the state level is important to ensure consistent regulation and enforcement of digital billboards. In fact, 15[2] other states have adopted lighting language regulating off premise CEVMS. As an industry leader and a member company of the Outdoor Advertising Association of America (OAAA), we advocate for such responsible regulation.

These proposed regulations are integral to standardized sign operation because they in part, accomplish the following:

- Insure off-premise digital signs will not have motion, flashing or video

[1] From The Outdoor Advertising Association of America, effective July 15, 2015
[2] Includes Puerto Rico

Clear Channel Outdoor
4945 Joule Street Reno, NV 89502
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- Compliance with federal regulations
- Insure signs are never too bright for conditions
- Limits message changes to no more than once every six seconds
- Establishes a strict and enforceable maximum brightness standard for CEVMS
- Utilize operating characteristics that were founded on sound scientific principles and theory

The maximum foot candle brightness limit proposed is strict, enforceable and widely accepted. The brightness operating criteria are based on established scientific methodology and established industry standards from the Illuminating Engineering Society of North America (IESNA) publication TM-11-00 "light trespass" theory which is an accepted standard in the lighting industry.

CCO, Lamar and the OAAA (Outdoor Advertising Association of America) recognized/member companies voluntarily adhere to the recommended brightness criteria. This follows lighting standards established by the Illuminating Engineering Society of North America (IESNA).

Lighting Sciences, Inc. has undertaken research to develop a method for specification of luminance (brightness) limits for digital billboards based on accepted practice by the Illuminating Engineering Society of North America[3]. This method requires lighting levels for CEVMS will not increase by more than 0.3 foot candles (over ambient levels) as measured using a foot candle meter, at a pre-set distance[4].

In addition, OAAA recognized/member companies utilize a photocell on digital billboards so that the display will easily be seen by motorists under changing light conditions. Sophisticated dimming software constantly changes the brightness of the display in response to changing ambient lighting conditions. This insures a digital billboard will never be too bright for conditions day or night, urban or suburban.

Two separate in-the-field lighting measurement demonstrations held in Nevada. On March 24, 2015 in Reno and in April 2015 Las Vegas, representatives from the state, two outdoor companies and two LED sign manufacturers gathered. The culmination of this scientific methodology, the proposed brightness measurement standard for digital billboards and the proposed regulations were the focus of these demonstrations. At these demonstrations different size and types of electronic signs were observed at different times of day and night. Signs were viewed in a variety of ambient light conditions. Demonstrations occurred of comparative light measurement analysis.

The FHWA guidance memo[5] dated September 25, 2007 concluded that CEVMS do not violate a prohibition against "intermittent" or "flashing" or "moving" lights and the various Federal-State Agreements. These agreements represent the "effective control" the Highway Beautification Act of 1965 (codified at 23 U.S.C. 131) required of all states. The memo provides operational standards as information for states considering standards. Regarding brightness, the letter states "...Adjust brightness in response to changes in light levels so that signs are not unreasonably bright for the safety of the motoring public."

[3] Digital Billboard Recommendations and Comparisons to Conventional Billboards, by Ian Lewin Ph.D., FIES, L.C., Lighting Sciences, Inc. 2008

[4] Measure from a distance of 250 feet away for a digital billboard with a nominal face size of 14 ft x 48 ft.

[5] USDOT Federal Highway Administration Memorandum, Subject: Information: Guidance on Off-Premise Changeable Message Signs, dated September 25, 2007

Clear Channel Outdoor
4945 Joule Street Reno, NV 89502
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Clear Channel Outdoor

The FHWA completed a study[6] on the effects of digital billboards on driver attention and distraction in 2010. This study was aimed at determining if digital billboards posed an unsafe driver distraction and was based on how long drivers took their eyes off the road when in the presence of digital billboards. The results were released in Dec. 2013 and indicated the following:

- The presence of digital billboards does not appear to be related to a decrease in looking toward the road ahead, which is consistent with earlier industry sponsored field research studies (VTTI)
- The longest fixation to a digital billboard was 1.34 seconds, and to a standard billboard it was 1.28 seconds, both of which are well below the accepted standard[7]
- When comparing the gaze at a digital versus a static billboard, the drivers in this study were more likely to gaze at digital than at static billboards

The bottom line is that digital billboard glances are well within federal safety standards concerning driver distraction.

We have reviewed the proposed regulations and we are in support with one important exception. We are not in support of NAC 410.350(3)(f) which states that if the foot-candle reading exceeds (0.3) foot-candles maximum, then the nighttime luminance shall not exceed 250 nits. We believe this should be changed to a maximum of 350 nits.

- The 350 nit number is backed up by proven, sound science. In a report previously provided to the state by Lighting Sciences, Inc., and based on IESNA Lighting Zone E2[8].
- Most digital billboards when viewed at night will not have an image clearly visible when not exceeding 250 nits in output
- The inclusion of a nit standard in addition to the foot candle standard is redundant and unnecessary
- The fall back nit number concept itself is arbitrary and flawed. The 250 nit number is itself arbitrary
- If a digital sign is out of compliance with the 0.3 foot candle limit, the state has enforcement measures to deal with it

Thank you for your consideration of our suggested change to the proposed regulations. Digital billboards are already permitted and regulated in the State of Nevada and these additional regulations will simply formalize the existing and long standing procedures for operation of these signs, in addition to ensuring that all off-premise digital signs are operated in accordance with Federal standards

[6] The full report DRIVER VISUAL BEHAVIOR IN THE PRESENCE OF COMMERCIAL ELECTRONIC VARIABLE MESSAGE SIGNS (CEVMS) dated September 2012 is available on the FHWA website http://www.fhwa.dot.gov/real_estate/practitioners/oac/

[7] According to the National Highway Traffic Safety Administration (NHTSA), safety concerns arise when a driver's eyes are diverted from the roadway by glances that continue for more than 2.0 seconds.

[8] Zone E2 is characterized as "Low ambient electric light." There are many areas throughout the state that have medium and high levels of ambient lighting at night. In these areas 250 nits will not produce an acceptable or readable image on many signs during nighttime ambient light conditions.

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Clear Channel Outdoor

Sincerely,

Susan Holshouser

President and General Manager

Reno Division

Bill Kurr

President and General Manager

Las Vegas Division

C: Paul Saucedo
Chief Right-of-Way Agent
Right-of-Way Division
Department of Transportation
State of Nevada
1263 S. Stewart Street
Room 320
Carson City, NV 89712
psaucedo@dot.state.nv.us

Clear Channel Outdoor
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LAMAR ADVERTISING COMPANY

Mr. Jerry M. Hoover
Assistant Chief Statewide Utilities Right-of-Way
Nevada Department Transportation
1263 S. Stewart Street
Carson City, NV 89712

Re: Comment to Proposed CEVMS (Digital Billboard) Regulations NAC 410.350 Sign construction: illumination / luminance; commercial electronic variable message signs. (NRS 410.400)

Dear Mr. Hoover,

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The adoption of certain operating standards, by which the outdoor industry is currently adhering to, is a responsible option when those standards have proven to be effective. Adoption of operating standards at the state level is important to ensure consistent regulation and enforcement of digital billboards. In fact, 15[2] other states have adopted lighting language regulating off premise CEVMS. As an industry leader and a member company of the Outdoor Advertising Association of America (OAAA), we advocate for such responsible regulation.

These proposed regulations are integral to standardized sign operation because they, in part, accomplish the following:

- Insure off-premise digital billboards will not have motion, flashing or video.
- Compliance with federal regulations.
- Insure signs are never too bright for conditions.
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The maximum foot candle brightness limit as proposed is strict, enforceable and widely accepted. The brightness operating criteria are based on established scientific methodology and established industry standards from the Illuminating Engineering Society of North America (IESNA) publication TM-11-00 "light trespass" theory which is an accepted standard in the lighting industry.

CCO, Lamar and the OAAA (Outdoor Advertising Association of America) recognized/member companies voluntarily adhere to the recommended brightness criteria. This follows lighting standards established by the IESNA.

Lighting Sciences, Inc., has undertaken research to develop a method for specification of luminance (brightness) limits for digital billboards based on accepted practice by the IESNA[3]. This method requires lighting levels for CEVMS will not increase by more than 0.3 foot candles (over ambient levels) as measured using a foot candle meter, at a pre-set distance[4].

In addition, OAAA recognized/member companies utilize a photocell on digital billboards so that the display will easily be seen by motorists under changing light conditions. Sophisticated dimming software constantly changes the brightness of the display in response to changing ambient lighting conditions. This insures a digital billboard will never be too bright for conditions day or night, urban or suburban.

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- When comparing the gaze at a digital versus a static billboard, the drivers in this study were more likely to gaze at digital than at static billboards.

The bottom line is that glances at digital billboards are well within federal safety standards concerning driver distraction.

We have reviewed the proposed regulations and we are in support with one important exception. We are not in support of NAC 410.350(3)(f) which states that if the foot-candle reading exceeds (0.3) foot-candles maximum, then the nighttime luminance shall not exceed 250 nits. We believe this should be changed to a maximum of 350 nits.

- The 350 nit number is backed up by proven, sound science. In a report previously provided to the state by Lighting Sciences, Inc., and based on IESNA Lighting Zone E2[8].
- Most digital billboards when viewed at night will not have an image clearly visible when not exceeding 250 nits in output.
- The inclusion of a nit standard in addition to the foot candle standard is redundant and unnecessary.
- The fall back nit number concept itself is arbitrary and flawed. The 250 nit number is itself arbitrary.
- If a digital sign is out of compliance with the 0.3 foot candle limit, the state has enforcement measures to deal with it.

Thank you for your consideration of our suggested change to the proposed regulations. Digital billboards are already permitted and regulated in the State of Nevada and these additional regulations will simply formalize the existing and long standing procedures for operation of these signs, in addition to ensuring that all off-premise digital billboards are operated in accordance with Federal standards

Sincerely,

Christopher Prickett
Vice President/General Manager
Lamar Central Outdoor, LLC

cc: Paul Saucedo
Chief Right-of-Way Agent
Right-of-Way Division
Department of Transportation
State of Nevada
1263 S. Stewart Street
Room 320
Carson City, NV 89712
psaucedo@dot.state.nv.us

[8] Zone E2 is characterized as "Low ambient electric light." There are many areas throughout the state that have medium and high levels of ambient lighting at night. In these areas 250 nits will not produce an acceptable or readable image on many signs during nighttime ambient light conditions.

October 27, 2015

BY HAND AND EMAIL
Jerry M. Hoover
Assistant Chief Statewide Utilities Right-of-Way
Nevada Department Transportation
Reno, Nevada

Re: Response to Scenic Nevada document regarding digital billboards. Re: Proposed CEVMS (Digital Billboard) Regulations NAC 410.350 Sign construction: illumination / luminance; commercial electronic variable message signs. (NRS 410.400)

Dear Mr. Hoover,

We appreciate the opportunity to respond publicly, and on the record to numerous, erroneous allegations made by Scenic Nevada in their document titled "Digital Billboards and Environmental Impacts."

Scenic Nevada presents a classic example of obfuscating the facts in favor of conjecture in an effort to derail the legislative mandate to adopt modern rules regulating digital billboards. In fact, 15[1] other states have adopted lighting language regulating off premise CEVMS. Forty-three of the forty-six states that allow billboards also allow changeable message technology.

To our knowledge, Scenic Nevada has been the only interested party since the passage of AB 305[2] in 2013. In the ensuing two year period Scenic Nevada has had ample opportunities to state their position(s). It is no accident that in this late hour of the process Scenic Nevada attempts this latest obstructionist position. They are succeeding in their secondary goal of hijacking and delaying the states process to fulfill a legislative mandate. Their "First Key Issue" is the "Control of billboard blight[3]," not the control of billboards. A not so subtle inference revealing their political bias. They may not be aware that digital billboards, aka Commercial Electronic Variable Message signs ("CEVMS") have been permitted in the state of Nevada for many years under NRS 410.400 and NAC 410.350.

Responses to by "Digital Billboards and Environmental Impacts," by Scenic Nevada

Scenic Headline: "Digital billboards are intrusive energy hogs that contribute to skyglow and light pollution."

Response: Statement is subjective and pure conjecture.

A digital billboard is comprised of thousands of LED clusters in one sign face; however the energy efficiency of the LED bulb is unparalleled in our industry. One LED diode is much smaller than a pencil

[1] Includes Puerto Rico
[2] Bill AB 305 amended NRS 410.400 and required regulations to be promulgated to address operational requirements for CEVMS. Adopted April 27, 2013
[3] http://www.scenicnevada.org/wp/the-key-issues/ October, 22, 2015

eraser. Where the majority of energy is lost as heat in the illumination of a common incandescent lighting fixture, an LED diode uses more than 90% of its energy as emitted light.

The ambient light level surrounding a digital billboard will not vary significantly from that of a traditional billboard display. (In many cases it will be less.)

The technological specifics of LED lighting are unique. Our signs will not contribute to the overall sky glow for three main reasons:

1 The LED diodes used in our signs emitted light in a directed beam
2 The signs are aimed at the roadway so vehicular traffic can easily see the advertising message
3 Horizontal Louvers manufactured as part of the sign face help to prevent upward illumination.

Sky glow results from the use of lighting fixtures that emit light above a horizontal plane so that it enters the atmosphere directly. Digital billboards contain directional LEDs that prevent sky glow which may be produced by traditional billboards.

Fluorescent and standard 'bulb' shaped incandescent lamps emit light in all directions. This leads to a large portion of the light produced by the lamp escaping from the fixture in a direction that is not useful for the intended application, specifically above the sign. The directional nature of LED's used in digital billboards however, prevent excess light spillage in unintended locations. Additionally, louvers on these signs assist in controlling the light output by shielding light directed upward.

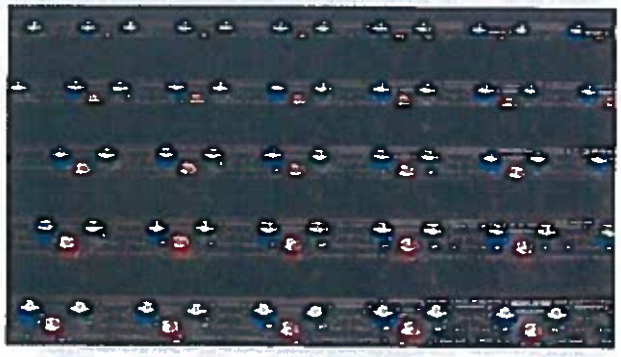
Scenic Statement: "Global light pollution is increasing by 6 percent per year."

Response: We would be interested to review a study conducted in Nevada that empirically states that light pollution is increasing.

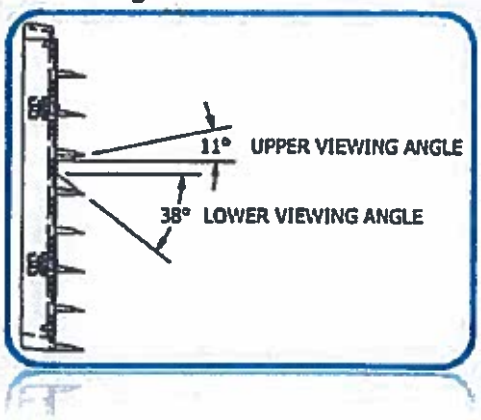
Scenic Statement: "Built-in sunshade louvers do little to minimize digital signs' impact on the night sky."

Response: LED digital billboards contain louvers which have multiple functions. One of which is to partially shield the lighting from shining upward, into the sky.

A close up look at "louvers"



Side drawing of LED module:



-Source Yesco

In this actual example, only a portion of the light emitted reaches 11 degrees above the horizontal plane. The most commonly deployed LED's by CCO in Nevada have a vertical viewing angle 49 degrees from Yesco.

Response: The referenced source cites Lighting and Astronomy", Luginbuhl, Walker & Wainscoat, Physics Today, December 2009 as a source refuting these claims.

The referenced source's claim of "intense brightness" will not be relevant with the adoption of the states proposed brightness limitations; 0.3 footcandles above ambient light. This will insure that even though a product may be technically capable of brighter display, the actual operation in the field will comply with code and insure the sign will never be too bright for conditions. This is achieved by using a combination of an ambient light sensor and sophisticated dimming software

Response: It references a source of opinions by "a group of Illinois citizens from diverse backgrounds." Their webpage contains numerous factual errors and assumptions based on incomplete information.

Scenic Statement: "Digital signs emit light into the night sky, contributing to light pollution."

Response: The aforementioned facts and explanations prove that digital billboards contribute less to light spillage than most other types of outdoor lighting.

The lighting levels will be set to be appropriate for the surroundings. The illuminance of the area around the sign is not uniform. The illuminance is greatest in the area that is directly perpendicular to the sign, and gradually tapers off to nothing as you become more directly parallel to the sign. This result is because a LED sign is not a uniform light source, but rather it focuses the light in specific directions. For this reason, the brightest point is directly perpendicular to the sign, and gradually fades out as you move outside the viewing cone of the sign.

During daylight conditions, the maximum illuminance area reaches as far as 250 feet from the sign at 0 degrees from center. During nighttime conditions, the maximum illuminance area reaches 100 feet from the sign at 0 degrees from center. This scenario contemplates signs at ground level. These distances will decrease further when you factor in that the bottom of the typical off premise sign face is 33 feet in the air. Just as the horizontal viewing angle affects how much area the sign illuminates, the vertical height of the sign also affects how much area the sign illuminates.

Response: The majority of digital billboards existed as traditional billboards prior to their conversion. In each case the external lighting fixtures were removed as part of the conversion and brought a correlating reduction in overall lighting.

Scenic Statement: "Billboard industry lighting standards are more liberal than what some lighting experts recommend – and digital signs are three times brighter than traditional billboards at nighttime."

Response: This statement is factually incorrect. The wording above gives the reader the impression that all digital signs are too bright. While most digital signs may be technically capable of brighter display, the actual operation in the field will comply with proposed requirements and insure the sign will never be too bright for conditions.

Response: The ambient light level surrounding a digital billboard will not vary significantly from that of a traditional billboard display. (In many cases it will be less.) The light levels to be appropriate for the surroundings and in compliance with the proposed brightness regulations.

A photocell measuring ambient light is utilized on all CCO digital billboards so that the display will easily be seen by motorists under changing light conditions. Sophisticated dimming software constantly changes the brightness of the display in response to changing ambient lighting conditions. This insures a digital billboard will never be too bright for conditions.

The range of brightness varies greatly between daytime and nighttime conditions. In bright daylight, the unit must have higher intensity in order to be seen. During darkness conditions, the brightness can be set low and still be easily seen by motorists.

There are 3 necessary components to insure a digital billboard will never be too bright for conditions.

1 An ambient light sensor installed on the sign structure
2 Dimming software
3 Maximum brightness limits incorporating a 0.3 footcandle standard with set distance to measure from

Response: The 0.3 maximum foot candle brightness limit proposed is strict, enforceable and widely accepted. The brightness operating criteria are based on established scientific methodology and established industry standards from the Illuminating Engineering Society of North America (IESNA)

publication TM-11-00 "light trespass" theory which is an accepted standard in the lighting industry. This follows lighting standards established by the Illuminating Engineering Society of North America (IESNA).

15[4] other states have adopted lighting language regulating off premise CEVMS. 9[5] states currently use the 0.3 maximum foot candle brightness limit.

Lighting Sciences, Inc. has undertaken research to develop a method for specification of luminance (brightness) limits for digital billboards based on accepted practice by the Illuminating Engineering Society of North America[6]. This method requires lighting levels for CEVMS will not increase by more than 0.3 foot candles (over ambient levels) as measured using a foot candle meter, at a pre-set distance[7].

In addition, OAAA recognized/member companies utilize a photocell measuring ambient light on digital billboards so that the display will easily be seen by motorists under changing light conditions. Sophisticated dimming software constantly changes the brightness of the display in response to changing ambient lighting conditions. This insures a digital billboard will never be too bright for conditions day or night, urban or suburban.

Response: The single expert we presume Scenic Nevada is referencing is from a report completed by an individual, not commissioned by government. In this report, "REPORT ON DIGITAL SIGN BRGHTNESS,[8]" the author states the term *"...brightness" is not a term of science, and cannot be measured objectively."* We respectfully disagree. Brightness can be objectively analyzed and assessed. The author sets a basis from which to frame his arguments by customizing the terms and definitions to favor a pre-determined outcome.

The clear intent of the author here is to set up his positioning that nits are a better measure of brightness as perceived by the human eye. This is inaccurate on its face.

In reality, Luminance is a measure of brightness, at the source. Luminance is a helpful measurement set when purely assessing maximum output of a digital billboard. Luminance is measured in nits. Nits do not take into account ambient light or a lack thereof. Nits are not used as measurement of what the human eye sees. In fact, the human eye perceives brightness by also taking into account the ambient light, or a lack thereof. That "brightness" is defined by "illuminance" and is measured in foot candles.

The best method to measure a signs "brightness" is to

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[4] Includes Puerto Rico
[5] Includes Puerto Rico
[6] Digital Billboard Recommendations and Comparisons to Conventional Billboards, by Ian Lewin Ph.D., FIES, L.C., Lighting Sciences, Inc. 2008
[7] Measure from a distance of 250 feet away for a digital billboard with a nominal face size of 14 ft x 48 ft.
[8] Prepared for the Nevada State Department of Transportation, Washoe County, City of Reno and City of Sparks, By Jerry Wachtel November 2014

a) do so at a point away from the sign, where viewers are likely to see the sign from
b) measure the light or perception of this light at that point, while taking into account ambient light, or a lack thereof. As this most closely simulates all the environmental conditions the human eye tales into account
c) This can be accomplished by measuring illuminance, utilizing a foot candle standard with a pre-determined measuring distance

Members of the public, government employees and elected officials should not be misled by this positioning. The author attempts to disguise a reliable method to measure sign brightness output as a reasonable method to measure the brightness perceived and received by the human eye. The author is factually incorrect.

Scenic Statement: Researchers believe light pollution not only dims the night sky, but also affects human health and animal behaviors.

Response: A very general statement representing theory. We are not aware of any empirical studies presented to support this statement.

Scenic Statement: In a 24-hour period, a digital billboard uses the same amount of energy as 15 average U.S. homes. Source "Illuminating the Issues[9]." Referred to as follows as "The paper."

Response: This source was endorsed by (and likely funded by) SCRUB. SCRUB based in Philadelphia, PA is an anti-sign organization, any report performed "in collaboration with SCRUB" should be viewed as one prepared to justify their anti-signage positions. It would be a mistake for any regulator or public official to view the findings in their report as unbiased, factual or scientific.

Response: The allegations in is this paper caused the industry to hire outside experts to evaluate the findings. Those results are attached. Titled "Evaluation of Methodology "Illuminating the Issues: Digital Signage and Philadelphia's Green Future.[10]"

Highlights:

"In general, "Illuminating the Issues" relies on inaccurate data, questionable methodologies, and sweeping statements presented without supporting evidence as the basis for its analysis. It overestimates electricity consumption and greenhouse gas emissions, and it underestimates efficiency gains and prospects for future innovation. To be credible, any analysis of environmental or energy impacts and resulting claims about corporate achievement or product performance should be grounded in accepted methods, consistently applied across industries. These methods should be applied to claims about environmental achievement as well as critiques of failure to perform. "Illuminating the Issues" does not adhere to this approach. The result is an exaggeration of the environmental impact of the

[9] Gregory Young, "Illuminating the Issues: Digital Signage and Philadelphia's Green Future,"
[10] Evaluation of Methodology "Illuminating the Issues: Digital Signage and Philadelphia's Green Future. By Catharine Cyr Ransom, Managing Director The Glover Park Group, Washington, DC July 2011

digital billboard industry, leading to flawed conclusions and recommendations that lack credibility and should not be used as a basis for decision-making."

The reports continues: *"Electricity Consumption Overstated By as Much as 3.5 Times the Average"*

Response: The statements in the paper of the energy usage of LED signs are gross exaggerations based on information that was out-of-date even when released in 2011. The paper does not take into account the dramatic gains in energy efficiency of newer models. Industry responses from 2011 soundly discredit these claims:

Digital billboards use one-fourth of the power required just six years ago. One manufacturer expects another year over year decrease of 25% in power consumption in 2011: http://www.prnewswire.com/news-releases/yesco-electronics-sees-dramatic-improvement-in-digital-billboard-energy-efficiency-112661604.html

Another manufacturer of DBB's states gains of 79% in power efficiency in the past 3 years:

http://finance.yahoo.com/news/Daktronics-Increases-Digital-pz-401445452.html?x=0

CCO continues to be poised to adopt new technology as it becomes available and practical.

Response: Some of the energy calculations made in the paper and its resources are made with inaccurate assumptions: Example, full white copy (which is all color pixels on at the same time) and running at 100% output. This would be similar to rating vehicle fuel mileage while operating a car at full throttle. In actual operation, full white copy is extremely rare and with live copy, in daytime hours, a digital billboard could be running at 50%-75% of its maximum rated brightness, further reducing the energy consumption. If these real world factors are accounted for, they expose the miscalculations of some of the energy consumption numbers in the "paper."

Response: The outdoor advertising industry is committed to energy efficiency, and the digital billboard marketplace has driven the demand for improvements over the years. Digital billboards today use a fraction of the power required when they were new, and we expect additional decreases in power consumption. Companies are poised to adopt new technology as it becomes available and practical.

It is important to note, when we alter the method of copy changes by installing a digital sign face, there are many other energy consumption factors affected. We must also consider the carbon offset by eliminating petroleum based substrates and replacing with a digital sign face:

- Petroleum based products to manufacture a polyethylene vinyl.
- Diesel Fuel and tires transporting the vinyl from the manufacturer to the plant, and then to the sign location.
- Customers are demanding more flexibility with their messages. This lends itself to the digital product as it is much easier and more cost effective for the advertiser to change copy digitally than by changing vinyl's.

The ability of the LED sign face, visible to large amounts of drivers in an emergency event, is a significant public benefit - consider accident notifications, AMBER Alerts, or FBI crime bulletins.

Response: The "paper" makes incorrect conclusions regarding the size of digital billboards. This is an important distinction as it relates to the power consumption: *"They (LED) are the overwhelming preference for large off-premise digital billboards; designed for long-distance impact, they are often up to 1200 sq. ft. in size (20'x60')."*

More than 90% of CCO's large format DBB's are of the standard roadway dimensions of 14' x 48.' This 672 sq. ft. display is significantly smaller (56%) than the (much less common) 20' x 60' size claimed by the "paper" at a face size of 1200 sq ft. This basic information is readily available on the major DBB operator websites. These errors of 75% and 56% (deliberate or caused by lack of a modicum of research) cause a major flaw in the "paper" calculations. Additionally, only a fraction of the billboards in the U.S. contain digital faces.

Scenic Statement: To be visible in daylight, digitals use more electricity and burn brighter, often requiring air conditioners during the hot summer months to cool thousands of LED lights.

Response: Early generations of LED signage did contain air conditioning to cool the entire sign face. One of our predominant suppliers has not used air conditioning on their units in 5 years. Another predominant supplier has been shipping units for more than 5 years that air condition only the control cabinets, not the LED panel itself.

Of the older LED sign units that do have air conditioning provided to their control boxes, this amount of energy usage is similar to a large household refrigerator. With all due respect, the author's conclusions on this subtopic are drawn on much higher levels of usage, which are inaccurate.

Scenic Statement: During Nevada's hottest days, digitals will draw the most electricity during peak usage hours, just when businesses and residents need it most.

Response: Usage of electricity during peak hours results in the payment of peak rates to the utility companies. The daytime usage of electricity is common across all types of businesses. There is no reason why the billboard industry should be considered differently than any other type of business.

Scenic Statement: Digital billboards are not only a contributor to skyglow (a form of light pollution), but they are also greedy energy hogs.

Response: Ample information provided above contradicts this biased statement. This statement uses an undefined reference to some amount of light emission. In contrast, the proposed regulations will limit lighting to reasonable amounts widely accepted in many cities and states.

Scenic Statement: Digitals have also been multiplying. In 2008 there were only about 800 digital billboards nationwide; in 2014, about 5,200.

Response: We are confident that state is more concerned with the number of digital signs located in Nevada. There are currently over 100 off-premise digital billboards in operation in the state of NV, between Lamar and CCO alone, seemingly without incident.

In closing, there are over 6,100 digital billboards[11] in operation across the US in 43 states. We are unaware of any ongoing brightness compliance or environmental issues with the 1,200 digital billboards that CCO operates or the 2,100 digital billboards that Lamar operates. Furthermore, nearly 1,000 localities allow digital billboards that have been installed consistent with state and federal requirements.

Sincerely,

Susan Holshouser

President and General Manager

Reno Division

Bill Kurr

President and General Manager

Las Vegas Division

C: Paul Saucedo
Chief Right-of-Way Agent
Right-of-Way Division
Department of Transportation
State of Nevada
1263 S. Stewart Street
Room 320
Carson City, NV 89712
psaucedo@dot.state.nv.us

[11] From The Outdoor Advertising Association of America, effective July 15, 2015