



July 2 2013

Mr. Kevin Ham
Economic Development Director
City of Vista
200 Civic Center Drive
Vista, California 92084

Re: City of Vista Digital Message Boards: Draft Initial Study and Mitigated Negative Declaration.

Dear Mr. Ham:

I have read with interest and concern the subject document, which I will refer to in this letter as the MND.

By way of background, I have considerable experience on the subject of the impacts of digital billboards on traffic safety and aesthetics. I directed the Federal Highway Administration (FHWA) Highway Aesthetics Laboratory at the time that FHWA issued its first comprehensive report on digital billboards. I was the senior author of that report (1) which was awarded the outstanding technical publication of the year by FHWA. I was a co-author of one of the studies cited in the MND (2) and the sole author of the other cited study (3). I currently chair the Digital Billboards Subcommittee for the Transportation Research Board (TRB) of the National Academies. I have written extensively about digital billboards, and have given invited presentations on this topic to many professional, scientific, and civic organizations, as well as to city and county government agencies nationwide. I have testified on these issues in Federal and State courts, and have never been denied qualification as an expert in these matters.

With this brief background as an introduction, please accept for the record the following comments regarding the MND.

Section 3.2.

Section 3.2, Purpose and Need, is erroneous and misleading

- This section states: “The purpose of the proposed project is to communicate city messages for the benefit of the community.” Since, under “non-emergency” situations, the signs would display commercial advertising 85% of the time, and the City would be able to display “Pubic Service Messages” a maximum of 15% of the time, it is clear that the purpose of the proposed project is for commercial advertising, and not “for the benefit of the community.” (MND pg. 5)

- The fourth paragraph of Section 3.2 states, in part: “The image on each display would be static for a period of time, *usually eight seconds*, (italics added) before cycling to the next image. (MND, pg. 6). The specification for this “cycling” time, commonly called “dwell time” in the industry, is critical for several reasons. The shorter the dwell time, the greater the number of image changes any given driver will be able to observe, and the greater the potential distraction caused by the sign. Indeed, it is the message change that is the single greatest cause of driver distraction from digital billboards. It is wrong for the city not to specify an exact dwell time in its MND when this factor is of such great importance. Numerous jurisdictions, around the world, have addressed this issue and specified specific dwell times tailored to the road and traffic conditions, sight distance and prevailing speeds, that are present at CEVMS locations. I have developed and published a formula that cities and other government agencies can use in establishing a dwell time that serves to reduce the likelihood of driver distraction caused by the message change (3, p. 146). When not following this formula, recent research (4, 5) suggests that minimum dwell time should be no shorter than 10 seconds. It is also noted that a unanimous Arizona appellate court has agreed that a dwell time of eight seconds, as proposed herein, constitutes intermittent light, something expressly prohibited by the Highway Beautification Act.
- The third listed specification is titled: “Brightness of digital display” (MND, pg. 6). This specification is incomplete and inappropriate, as described in more detail below. There are two basic methods for measuring “brightness” of a digital display. The first, used in this MND, and recommended by the Outdoor Advertising Association of America (OAAA) is known as *illuminance*. The second, recommended by scientific experts (6, 7, 8, 9) and governments around the world (e.g. 10, 23) is known as *luminance*. Despite their similar names, they utilize different measurement methods, equipment, and techniques. The method proposed in the MND is the one recommended by the outdoor advertising industry; however it is generally agreed, as shown in the research cited above, that this method is not reasonable for use in this application.
- The specification titled: “Display Dimming” (MND, pg. 6) is either inadequate, or inadequately described. It is necessary, but not sufficient for the display to be dimmed “during hours of darkness” as described in the specification. The display must also be dimmed during storms, dark clouds, etc., when the sky may darken during normal daylight hours. A display that dims during hours of darkness typically relies on a timer to provide such dimming, rather than an optical sensor that can dim the display during sky darkening events that may occur during daylight hours.
- The specification titled “Visual Verification” (MND, pg. 6) states, in its entirety, “Webcams would be installed for visual verification.” As written, this statement is confusing. What is it that is being *verified*? If the intention is that a webcam will be used to ensure that the display brightness is appropriate for the environmental conditions at any given time, then this should be so stated, and the method of operation specified. Conversely, many digital billboards include cameras or other recording devices that are aimed at, and record approaching traffic. Such devices, often included under the guise of providing feedback to the advertiser that their message is actually being observed by motorists can, in fact, serve to invade the privacy of drivers and their passengers by recording their automobile, license plate number, and occupant’s faces. If it is this alternative that is proposed under “visual

verification,” this should be specified and detailed.

- The specification titled Energy Demand states that the two message boards (4 faces) would consume approximately 526,000 kilowatts per year, and would operate 24 hours per day. Given that this energy demand is approximately equivalent to that needed to fully power some 88 typical California homes, and given the likelihood that traffic volumes (and hence, potential viewers) are greatly reduced during late night and early morning hours, has the City performed a cost-benefit study to determine the wisdom of such 24 hour operation?

Section 4.0.

Section 4.0: Environmental Initial Study Checklist is inadequate

- This section discusses the Federal-State agreement (FSA) entered into by FHWA and California. The first stated restriction as part of this agreement states: “No signs shall imitate or resemble any official traffic sign, signal, or device...” How does the City intend to enforce this provision of the FSA, when violations of this restriction are not uncommon? What penalty will be applied to such violations if and when they occur, and how will such penalties be enacted?

Section 5.1c.

Section 5.1c asks: “Would the project substantially degrade the existing visual character or quality of the site and its surroundings?” (MND, pg. 33-4), and responds that it would have “less than significant impact.” We disagree.

- Figures 4 and 5 of the MND show a simulation of the proposed digital sign at the West Vista Way location. The MNB takes the position that because “the proposed message board would have a footprint of approximately 8-feet by 8-feet” (presumably this is the approximate size of the base of the sign support column) “the message board would result in a change of character to a small portion of the site” and “would not result in a substantial degradation of the site or its surroundings. If we have interpreted this statement correctly, the MND is addressing the *physical* degradation of an 8-foot by 8-foot footprint (along with its associated minor visual impact), and ignoring the enormous visual and aesthetic degradation of the site caused by placing a 672 ft billboard, 40-50 feet above a hillside that is currently covered completely with vegetation. While the MND admits that the proposed billboard site currently “provides a natural setting,” it takes the position that, because the site is zoned commercial, it might be developed at some point in the future. The report then reaches the conclusion that, because of these two reasons, the impacts associated with the degradation of visual character or quality would be less than significant. As pointed out above, it is not the 8x8 foot footprint of the proposed sign’s support column that adversely affects the visual character of the site; rather it is the 40-50 foot high, 672 square feet large sign looming above this “natural setting.” And because this MND addresses only the proposed billboard, and not some undefined, unplanned, possible future use, it is inappropriate to use such undefined alternative use as a basis to claim a less than

significant impact. In fact, the impact is significant, and cannot be mitigated because it is the billboard that is the sole cause of the impact.

- Figure 6 presents a simulation of the proposed digital sign called University Alternate #1, and raises the same aesthetic concern as that discussed above. The argument made in the MND seems to be: because this site is surrounded by high density residential, and commercial uses, and because it is a city right-of-way buffer, and because it is planted with non-native ornamental vegetation, then a digital billboard at this site would not degrade the existing visual character or quality of the site. This logic makes little sense. For purposes of the aesthetic value of the site, it does not matter who the owner is, or whether the ornamental vegetation is native or not. What matters is that a motorist's view of an existing, planted hillside will be negatively impacted by the billboard. This is a significant negative impact, and it cannot be mitigated because it is the billboard that is the cause of the adverse impact. Further, it appears that no attention has been paid to the residents of the "high density residential uses to the west" of this location. A 672 sq. ft. billboard, changing its image, and hence its colors and contrast, every (approximately) eight seconds, may be a significant adverse aesthetic impact to those whose windows look out on the billboard as well as to pedestrians and bicyclists in the area.
- We note that there appears to be an error in one of the simulations shown in Figure 6 or 7. Figure 6 purports to show the eastbound view of University Drive Alternate 1, and Figure 7 purports to show the westbound view of the same proposed sign. But Figure 7 also depicts an existing on-premise sign that appears to be essentially adjacent to the DBB, and rising to essentially the same height above grade, yet Figure 6 does not depict this sign. It cannot be determined which of these two Figures is erroneous, but the reader is unable, due to this confusion, to reach an informed understanding of the potential impacts of the proposed digital sign. Further, the image shown in Figure 7 appears to be artificially compressed in depth, as might occur from the use of a telephoto lens. This is especially significant when this image is compared to the same approximate view from another source, such as Google Earth, or Google Street View. The image as shown in the MND appears to have been made from a vehicle exiting a left-hand horizontal curve, but at this point on the roadway the existing on-premise sign would appear much smaller than it does in Figure 7. Thus, one wonders whether the scaling of the image shown in Figure 7 (and, perhaps, in other images as well) is realistic. Specifications should be provided (e.g. film or sensor size, lens focal length, etc., for all of the photographic renderings contained in the MND to ensure that they do not depict the apparent sign sizes unrealistically.

Section 5.1d.

Section 5.1d asks (MND, pp. 34-5): "Would the project create a new source of substantial light or glare which would adversely affect day or nighttime view in the area?" and responds that it would have "less than significant impact." We disagree.

- Motorists complain about the blinding brightness of digital billboards routinely. In fact, excessive brightness (properly called luminance) is the single greatest cause of complaints about such signs from the traveling public (11). While it is fine to have regulations enforced by Caltrans, one must wonder why sign luminance seems never to be adjusted to

acceptable levels until after considerable public complaint.

- While equipping digital billboards with sensors that automatically reduce luminance levels during hours of darkness is appropriate, it is insufficient, by itself, to address the concern of excessive brightness. That is because it is the billboard owner or operator who must establish the luminance levels to which the automated sensors will be set. As such, it is critical to understand how each sign's maximum levels will be set, and to what values. It is then equally critical that such maximums be tested to ensure that they do not exceed acceptable limits.
- Studies have shown that existing illuminated on-premise signs, as well as conventional floodlit billboards are easily readable at night by approaching drivers, and do not cause excessive levels of glare (6, 7, 8, 9). These studies suggest that there is no reason why digital billboards should not be held to the same luminance levels as such conventionally lit signs. Maintaining this standard will bring about added benefits, including: fewer, if any, complaints about excessive brightness from the public; avoidance of concerns about discomfort or disability glare to motorists; reduced likelihood that the digital billboard will dominate the visual environment to the detriment of all other signs within the field of view; and fewer concerns about light trespass into the night sky.
- The appropriate procedures for measuring billboard luminance have been discussed extensively elsewhere (see, for example, 3 [pg. 156-8], 7, 8, 9) and will not be repeated here.
- Nowhere in the MND did we see a specification for the maximum brightness (luminance) from the proposed signs. This value, as well as information pertaining to the "256 levels of dimming," is necessary for a reviewer to determine whether excessive brightness or glare is likely from the proposed signs.
- The MND states (p. 35): "There are residential uses in the vicinity of the project that would be sensitive to light. The nearest residential homes range between 150 to over 500 feet north of the West Vista Way Site and are orientated north away from the digital message boards" Later in this paragraph, a similar description is given for the University Drive Site Alternative 1: This site: "would be approximately 250 feet away from high density residential to the west of the project site." Because we were unable to find in the MND specific location information for the proposed signs using latitude and longitude data, we have had to approximate the proposed locations using Google Earth and Google Street View. Although the MND suggests that the orientation of the proposed signs would not align with the orientation of windows in any of these residences, apparently no study has been made of the potential light and glare that might affect such residents. Further, an inspection of the Vista Way site from Google Earth seems to show that the MND is incorrect - that several nearby homes are oriented such that their windows would look almost directly at the proposed billboard. (See Attachment 1 to this letter for a screen capture of the Google Earth view. In our work we have observed that digital billboards, even when dimmed for nighttime use and not on-axis with the viewer, are highly visible from substantial distances - six (6) miles or greater, and appear as the brightest objects in the environment. Accordingly, the MND's conclusion that: "the glare from a message board in

these locations would not affect nearby residences" seems implausible without documented study, and appears to be erroneous from our analysis using Google Earth. In light of these concerns, we must ask whether these potentially affected residents have been contacted.

Section 5.16b.

Section 5.16b asks (MND, pp. 63-4): "Would the project conflict with an applicable congestion management program, including but not limited to level of service standards ... ?" and responds that it would have "no impact." We disagree.

- Changeable message signs (CMS) visible to drivers on roadway are known to adversely affect traffic movement, as drivers slow to observe and read the message(s) on the sign. This is true for both CMS for official highway use and traffic control, as well as for commercial advertising signs, such as those addressed herein (12). Thus, there *will* be an adverse affect on traffic flow in the vicinity of the signs, and it is necessary to determine how this will affect the roadway Level of Service.

Section 5.16d.

Section 5.16d asks (MND, pp. 64-7): Would the project substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections or incompatible uses (e.g. farm equipment)? and responds that it would have "less than significant impact with mitigation incorporated." We disagree.

The MND states (p. 64): "The message boards would be visible by passengers ..."

- The MND should, of course, mention that the signs would also be visible by drivers, and this is the cause of the potential safety problem.

The MND states (p. 64): "the image on each display panel would be static for *usually* (italics added) eight seconds before cycling to the next image."

- The term "usually" is inadequate as a specification for this critical sign function. It has been repeatedly shown in scientific studies that the message change itself is the single greatest cause of driver distraction from digital billboards, which can lead to driver error, and ultimately crashes. This author has developed a model formula by which a reasonable location-specific message dwell time can be determined; the term "usually" provides no confidence that the message change interval will not be variable, or modified to change at a level that is unsafe and that violates Federal regulations against intermittent light.

The MND states (p. 64) that the FHWA, as part of its agreement with various states pursuant to the Highway Beautification Act, "has confirmed that ... signs may not be installed in such a manner as to ... obstruct or physically interfere with the vision of drivers in approaching, merging, or intersection traffic." The MND further states that FHWA's agreement with the State of California also requires Caltrans to enforce these provisions. And "the proposed project would be in compliance with the above measures by not ... placing (a) message board near an (sic) approaching, merging,

or intersecting traffic.”

- A review of Figure 9, which depicts westbound traffic at the University Drive Alternative 2 site, shows that the MND is incorrect. This Figure clearly shows a two-lane, high-speed traffic merge directly adjacent to the proposed sign, and is thus in violation of the FHWA Federal-State Agreement (FSA) with the State of California.

The MND states that FHWA has “monitored the issue (of driver distraction from digital billboards) closely, and released a report updating the agency’s view of the issues and research.” The MND then cites one sentence of a 96-page report, (which appears on page 2, not page 14 as stated in the MND). Further reading of this report would demonstrate a different perspective than that stated in the MND. For example:

- When scanning for hazards, drivers’ eye movements tend to fall within a horizontal window centered on the focus of expansion in the forward view. This focus of expansion is related to the visual flow of the moving scene where points and objects all emerge from a single point. Because an attention-getting billboard may be able to attract a driver’s glance even unintentionally, a CEVMS that falls within this scanning pattern can interrupt the pattern and cause a distraction at an inopportune time. Furthermore, research suggests that the distraction from a roadside billboard may be unconscious. Consequently, drivers may not be aware that they are being distracted, and they are unable to verbalize that any distraction occurred. (2, 16-17).

In the same paragraph, the MND cites an NCHRP Report (3), and correctly reports that the study recommended that CEVMS should be regulated as a means of protecting the public interest.

- What the MND fails to discuss, however, is that the regulations recommended in the NCHRP report go far beyond those controls contained within the MND. The regulations recommended in the NCHRP report for dwell time, luminance, and sign placement with regard to roadside geometry would not be met with the signs as proposed in the MND.
- Finally, the MND is silent on the extensive research conducted, peer-reviewed, and published subsequent to the FHWA and NCHRP documents. Since 2008, some 12 research studies have been completed in countries including: USA (13, 14), Canada (15), Sweden (4), Norway (16), Australia (17), England (18, 19), and Israel (20). Without exception, these studies have found convincing evidence that roadside billboards (both static and video) distract drivers’ attention to a degree that results in: poorer lane keeping, poorer speed control, failure to see imminent hazards, and delayed response to sudden, unexpected movements by other drivers.

The MND is silent on the topic of roadside visual clutter.

- The subject of roadside visual clutter has arisen in recent years as a source of adverse highway safety. When the roadside visual environment contains a surfeit of visual objects, including, but not limited to, signs, studies have shown that drivers have more difficulty, require more time, and make more errors when the need arises to respond quickly and correctly to an important visual cue. Such a visual cue could be a regulatory or warning

sign, or the turn signal or brake lights of a car ahead. (5, 21, 22). Figure 8 of the MND (depicting eastbound traffic at the University Drive Alternative 2 site) exemplifies a roadway environment with a high degree of visual clutter, primarily from existing on-premise signs. Worse, this visual clutter occurs where motorists are required to negotiate a horizontal curve, an area where billboards should not be permitted at all. An inspection of Figure 8 demonstrates that three of the five vehicles visible appear to be traveling not centered in their lanes. This behavior, known as lateral placement variance, is a common result of visual distraction and visual clutter. The addition of the proposed digital billboard, larger and higher than any of the existing signs, more dominant in the drivers' field of vision, and far brighter at night than any of the other signs, will make the visual clutter worse, with the likelihood of the negative safety consequences stated above. The MND is silent on the issue of visual clutter and its safety consequences, and, in this location, the proposed digital sign will exacerbate the safety concern, not mitigate it.

The MND states (p. 66): "another area of concern is the potential development of interactive signs that would be capable of communicating with vehicles or passengers. While digital message boards are not presently capable of such one-way (sic) or interactive communication, the future development of this technology would have unknown consequences, and should be identified by the operator prior to any implementation." (Presumably the MND should specify two-way, not one-way communication, since all billboards, digital and otherwise, perform one-way communication).

- The first question that arises here is: what will the city do if the operator does identify to the city that it proposes to use such technology? If the consequences are unknown, how will the city respond? Without an answer to this question, this issue cannot be mitigated.
- More immediately, however, we must point out that the MND is incorrect in its statement regarding interactivity. Such two-way, interactive digital billboards have been in use for several years, and are in use elsewhere in the U.S. as well as in other countries. This type of sign was discussed at considerable length in the NCHRP report cited above (3, pp. 173-5), and this was four years ago. The technology has only grown since that report was issued. The following few examples should suffice to demonstrate the existence of such billboards:
 - A digital billboard in Turlock, California, records the eye movements of drivers approaching the sign, and has the capability of changing the message based on facial characteristics of such drivers.
 - A series of digital billboards for a brand of automobiles can send a personalized greeting to approaching drivers of that brand of vehicle.
 - A digital billboard for a hospital in Florida suggests that drivers send a text message to an address on the sign to learn about current wait times in their several emergency room locations.
 - Billboards have been erected with large QR codes displayed on the sign, with the suggestion that the observer use a smart phone to click on the code to obtain additional information about the advertised product.

The MND describes two components to Mitigation Measure Tra-1 (MND, p. 66): a prohibition against moving and flashing lights; and a report required from the operator if it intends to install and implement one-way (sic) communication.

- In neither case do the two components of Tra-1 serve as any kind of mitigation. In the first case, the prohibition against moving and flashing lights is already in place in both Federal and State law. And in the second case, a report to the city from the operator stating that they intend to implement some new capability for their signs does not lead, in this MND, to any action on the part of the city to control, minimize, or prohibit such new technology.

Similarly, Mitigation Measure Tra-2 (MND, pp. 66-7) requires the operator to submit an annual report that addresses several matters related to sign operation and regulatory compliance.

- But, because it is the message change interval (dwell time), and the potential for excessive luminance levels that are the source of concern for driver distraction, the requirement for reports, without any action to address these key safety factors, is not mitigation at all.

For the reasons discussed above, we request that the City reject this project as described, and the associated MND. It is our understanding that the City is required to, and will revise the MND to address all the inadequacies and errors that we have identified herein. However, we believe that a fair argument can be made that the proposed plan will have significant adverse environmental effects, even after mitigation. Consequently, an MND is not adequate for this project and the City should prepare a complete Environmental Impact Report before proceeding further.

Please acknowledge timely receipt of this letter via return email. A list of all cited references appears below. Upon request, we can provide copies of any of these references to you. Please do not hesitate to contact us should you have questions about this letter or require additional information.

Sincerely yours,

Jerry Wachtel
President

Attachment: Screen shot from Google Earth showing proximity and sightlines to Vista Way DBB from nearby residences.

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**ATTACHMENT:
Screen Capture from Google Earth
Showing Proximity and Sight Lines to Vista Way DBB
from Nearby Residences**

