

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of hearing of a submission and further submission lodged by the **OUT OF HOME MEDIA ASSOCIATION OF NEW ZEALAND INC.** in respect of the 'Signs' Chapter and the 'Signs' Design Guide **Proposed Wellington City District Plan**

**REPLY EVIDENCE OF BRETT HARRIES
FOR OUT OF HOME MEDIA ASSOCIATION OF AOTEAROA
ON THE PROPOSED WELLINGTON DISTRICT PLAN – HEARING 7**

TRAFFIC

27 MARCH 2024

1. INTRODUCTION

1.1 My name is Brett Harries. My qualifications and experience are set out in my primary statement of evidence on this topic, dated 5 March 2024. I confirm that I am continuing to abide by the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023, as applicable to this Independent Panel hearing.

1.2 The purpose of this reply statement is to respond to the submission provided by Dr. Paul Van Houtte whose evidence (in part) sought to establish a causal connection between the existence of digital billboards and adverse traffic safety effects by reference to overseas studies.

2. THE RELATIONSHIP BETWEEN RESEARCH AND EXPERIENCE

2.1 As I have tried to carefully explain in both my primary evidence, in my verbal summary of that evidence and in response to questions from the Panel, much of the research that can be found by searching on the internet that relates to digital billboards is either:

(a) derived from laboratory experiments (mostly by way of driving simulator studies)¹ and which are only able to infer potential safety effects given the absence of any real-world validation;

and/or

(b) is related to studies undertaken in locations where the operations of digital billboards may differ significantly from those that apply in New Zealand (and Australia) and which are sought by the Proposed District Plan (for examples, implicit in the research may be animation / full-motion video displays; and/or use of significantly higher luminance levels; and/or

¹ Including the two research papers that Dr Van Houtte stated in response to a question to him regarding the papers that he considered were of most relevance to his presentation, being Meuleners *et al* (2020) and Mollu *et al* (2018)

instantaneous transitions; and/or shorter dwell times; and so on);

and/or

(c) is related to studies that include digital billboards in high-speed traffic environments such as on motorways or freeways.

2.2 If all the research papers in the internet world that contain the words 'billboard' and 'distraction' are considered as being relevant and appropriate to apply to the consideration of digital billboards in Wellington without any regard given to what sits behind that research, then through a process of selection that research will give you whatever answer you want it to give.

2.3 It is also important to acknowledge that while research that attempts to infer or predict the road safety effects of billboards (mostly from laboratory studies), may have been helpful in the days when digital billboards were emerging as a new advertising medium, the relevance of such research has now diminished, being replaced by what can be actually observed and measured in practice. As I have described in my primary evidence, New Zealand now has a 12-year history of digital billboard operations, (some other western countries now have 15-20 years operational experience), which enables the road safety effects of digital billboards to be evaluated first-hand and in detail. In other words, as every day of operational experience passes, research that attempts to predict the outcomes of those operations becomes less and less relevant.

3. Empirical Studies Cited by Dr. Van Houtte

3.1 Of the papers that Dr. Van Houtte has cited, just two involved empirical studies, these being Gitelman *et al* (2019), and Dukic *et al* (2013). However, both are fraught in terms of their relevance to the New Zealand context. I briefly discuss each separately as follows.

Gitelman

- 3.2 I briefly discussed the study by Gitelman *et al* (2019) me during my presentation in response to a question from the Panel. As described, the study involved the measurements of crashes that occurred on a section of highway prior to, during, then after covering or removal of all advertising signs on the highway (the periods studied encompassed six years between 2006 and 2012). The primary issue I have with that research, however, relates to context.
- 3.3 The study involved Ayalon Highway which is a freeway that crosses the greater Tel Aviv – Yafi metropolitan area in Israel and which operates with a general speed limit of 90km/h. Typically, it accommodates 4-5 lanes in each direction, with some sections that accommodate up to 6 lanes in each direction (12 lanes total). It is reported that the Ayalon Highway has 700,000 vehicles entering onto it each day². In the traffic engineering world (as verified by traffic congestion indices such as TomTom), Ayalon Highway is known as one of the more congested highways in the world.
- 3.4 The diagram below shows a view of one direction of the Ayalon Highway within Tel Aviv.



Source: Ayalon Highways (<http://www.ayalohw.co.il>)

² Source: Haaretz ([Driving to Work in Tel Aviv at Seven Miles per Hour: The Numbers Behind Israel's Traffic Woes - Business - Haaretz.com](#))

- 3.5 Aside from its rather remarkable scale, the Ayalon Highway had historically suffered from the unregulated establishment of billboards, with generally little or no control on:
- (a) sign proximity to the highway;
 - (b) sign orientation to moving traffic (most are aligned parallel, not perpendicular to the traffic lanes);
 - (c) placement in relation to traffic control devices, directional signs and interchanges;
 - (d) sign density in relation to other signs; or
 - (e) sign size.
- 3.6 It is estimated that during the experiment that was undertaken as reported by Gitelman, many hundreds, if not thousands of billboards were covered over or removed for a period of about one year. It is not reported within the Gitelman paper whether any of the signs and billboards were digital, but given that the period within which they were covered (2008 / 2009), it can reasonably be assumed that none were digital as they were not commonly in use during that period.
- 3.7 Below are two examples of some of the numerous static billboards on the Ayalon Highway, these examples having been extracted from Appendix B to the Gitelman paper. The massive sizes of the billboards and their poor placements are readily apparent.



Source: Gitelman *et al* (2019)



Source: Gitelman *et al* (2019)

A further example to illustrate the proliferation, size, proximity and poor orientation of billboards as extracted from Google Streetview is shown below.



Source: Google Streetview

- 3.8 With all due respect to Dr. Van Houtte, there is little, if anything, about the Gittleman paper that will help the Panel to understand the implications of digital billboard operations in Wellington. All that can be reasonably be taken from the paper is that if proposing to enable billboards on high-speed motorway locations, care must be taken to ensure appropriate standards relating to billboard size, placement and density.
- 3.9 It is also perhaps relevant that, notwithstanding the Gitelman paper, a significant number of digital billboards have since been established in Israel that operate within Israel, including adjacent to the Ayalon Highway.³

Dukic

- 3.10 Dukic *et al* (2013) is a Swedish study that recorded the glances made to a group of four digital billboards, and compared those to glances made to a group of other signs on the same road that consisted of a static billboard, 3 overhead gantry direction signs, 2 guide signs, and a bus lane sign. I note in relation to this study that:

³ See for example www.en.novamedia.co.il

- (a) all the signs, including the digital billboards, were located immediately beside a six-laned high-speed motorway; and
- (b) the four digital billboards were newly established as the first ever digital billboards in Sweden. In that regard they held a high novelty value, especially when compared to the type of signs they were being compared to (i.e. traffic signs such as the bus lane sign).

3.11 The photographic view below, which has been extracted from the Dukic paper, shows one of the digital billboards. Given the locations of the digital billboards and their novelty value in Sweden at the time, it is perhaps not at all surprising that they generated more frequent glances than those that occurred to the traffic signs and the static billboard.



Source: Dukic *et al* (2013)

3.12 Notwithstanding the comparatively more frequent and longer measured glances to the digital billboards when compared to glances to other existing standard road signs, the conclusion to the paper noted the following two important points:

“To conclude, electronic billboards appear to have an effect on gaze behavior because they attract more and longer glances than standard road signs. This clearly indicates that they do what they are built for. Whether they attract too much attention and constitute a bona fide traffic safety hazard cannot be answered conclusively based on the present data”.

and

“The present study constitutes one part of a larger investigation (Dukic et al. 2011), where analyses of speed at a macro level and accident statistics from 2003 to March 15, 2011, were included (no significant differences were found that could be attributed to the electronic billboards when comparing before and after installation).”

[Underlining is mine.]

- 3.13 The point to be taken from the above is that regardless of whether or not drivers are likely to glance at digital billboards more frequently and / or for longer than they might glance at standard road signs, there is no evidence that such glances have any measurable adverse impact on driver performances or road safety.
- 3.14 Similarly to the Gitelman paper, the Dukic paper is helpful in highlighting the need for some care in the placement and operation of digital billboards if they are to be seen from a high-speed motorway. However, that is about the extent of it. It is also interesting to note that notwithstanding the Dukic paper, there are now as many digital billboards operating in Sweden as would be typically expected for any western country, with the size of its digital billboard industry being comparable to that in New Zealand.⁴

4. Dr. Van Houtte Criticism of Reliability of Research

- 4.1 I take issue with the impression given by Dr Van Houtte in his presentation that all the research that I have cited in my primary evidence is ‘industry sponsored’ and therefore lacks credibility.
- 4.2 I do acknowledge that two of the five papers that I specifically referred to in my evidence received funding from the Australian Outdoor Media Association (**OMA**), but both were undertaken by highly credible researchers, and both were prepared with the knowledge of the relevant roading authorities. I discuss the probity of each of the Samsa and Goodsell papers briefly below. I note that all the other papers I have cited were funded, as far as I am aware, by the institutions that undertook the research, and were either published as research reports and/or were presented at international conferences.

⁴ See [Creative Outdoor Advertising Takes over the Sweden Market - \(movia.media\)](#)

Samsa

- 4.3 The Samsa (2015) paper describes research that involved the first-ever quantification of glance durations to different sign types, (i.e. digital billboards, static billboards, and on-premise signs).
- 4.4 Discussions that I have personally had with Ms Samsa, (and as also noted in her paper), reveal that the genesis of, and objectives for, the research arose from a meeting held between OMA and several road controlling authorities including the (then) New South Wales Roads and Traffic Authority (**NSW RTA**).
- 4.5 Ms Samsa was chosen for the research because of her background and experience. She is a Registered Psychologist and road safety behavioural specialist who has experience in road safety research and policy development. Ms Samsa is also certified by RMS as a road safety auditor (Level 3: Lead Auditor). She has previously worked for the NSW RTA as a road safety strategist and policy analyst; OMA as a policy advisor; and independently as a consultant.
- 4.6 Ms Samsa is well recognised as a competent and highly ethical researcher who has an intimate knowledge of driver behaviour and road safety. The fact that OMA chose to fund the research that had been discussed with the RCA's should in no way diminish the value of her research. I note in this regard that her 2015 paper was peer-reviewed for presentation at the 2015 "4th International Driver Distraction and Inattention Conference" (which I attended, and can confirm that the paper was well received); and at the 2015 "Australasian Road Safety Conference". Her paper was subsequently published in the proceedings of both conferences.

Goodsell

- 4.7 Similarly, Goodsell *et al* (2018) was research initiated by OMA in order to measure and quantify driver behaviours and driver performances prior to, then following the establishment of digital billboards at signalised intersections. This research was undertaken by the Australian Roads Research Board (**ARRB**), which undertakes the vast

majority of transportation-related research in Australia and New Zealand, with clients that are drawn from both the private and public sectors. ARRB is internationally recognised as one of the world's top four transportation research organisations. I note that NZTA has a representative on the Board of Directors of ARRB.

4.8 In my opinion, given that the authors of both the Samsa and Goodsell papers are particularly renowned and credible researchers, and given the circumstances and nature of the research they undertook which clearly seeks to genuinely advance road safety knowledge, there is absolutely no reasonable basis that I can see to question the objectivity or voracity of either.

5. Absence of Evident Road Safety Effects Due to Digital Billboards

5.1 As explained in my primary evidence, there is no evidence from the 12 years of digital billboard operations in New Zealand to suggest that there are any adverse road safety effects due to digital billboards. As also explained, this finding is arrived at from two directions, being:

- (a) examination of crashes that have occurred proximate to digital billboard locations to see if any either directly or indirectly refer to any distractive effects due to the digital billboard; and
- (b) comparisons of the crash numbers and crash patterns that occurred prior to installation of the billboard, with those that occurred following installation, to identify any potential changes that may be due to the presence of the digital billboard.

5.2 However, in his presentation, Dr. Van Houtte suggests (without any supporting evidence), that digital billboards may not show up as a contributory factor to a crash because crashes are 'multi-factorial', and the influence of the billboard may be too insidious to be recalled by a driver as being a contributory cause. I do not at all accept Dr. Van Houtte's theory in this regard for the following reasons:

- (a) Even if drivers failed to, or for some reason did not want to, recall the potential influence of a digital billboard as a particular crash contributor, any such crashes would still show up as producing changes to crash numbers or crash patterns at billboard locations as described in paragraph 5.1(b) above.
- (b) The Crash Analysis System (CAS) reveals that drivers appear to have no difficulty in citing all manner of other potential distractors, both within and external to the vehicle. It seems to me highly improbable that drivers will be aware of, and will cite distractions due to scenery, people, buildings, aircraft, construction / road works sites, animals, etc; but will either be unaware of or unwilling to refer to a billboard.
- (c) Rather, my past experience as a forensic crash analyst suggests that drivers will do everything possible to implicate as many external influences as possible in order to avoid the possibility that they might be thought of as either a poor or incapable driver, or were mind-wandering, or were engaged in an activity for which there might be other ramifications (such as using a cellphone for example).
- (d) It would also appear to be contradictory of Dr. Van Houtte to describe digital billboards as being big brightly-lit signs that have as their prime purpose the capturing of a driver's attention, but to then state that if a crash occurred, drivers would not recall that they were looking at the sign. Indeed, if digital billboards were contributing to crashes but were going unreported as Dr. Van Houtte seems to suggest, then in my opinion it would require some sort of nationwide conspiracy to explain how not even one of those crashes was recorded over the past 12-years of digital billboard operations.

5.3 By way of illustration of the above points, I have looked at the crashes that have occurred in the vicinity of the billboard at the intersection of Adelaide Road and Alfred Street, which Dr. Van Houtte seemed to be particularly concerned about in terms of road safety effects, especially

to cyclists. The digital billboard at that location was established at the end of 2022 / beginning of 2023. I have therefore looked at all crashes within a 50m radius of the intersection for the prior 5-year period 2018-2022, and for the 1.2-year after-period since the billboard has been operating.

- 5.4 Whilst the after-period is relatively short, my experience in relation to a wide range of newly introduced features into a traffic environment is that it is more likely to have an affect on driver attention soon after its introduction whilst it is still new or novel; with attention that rapidly wanes as motorists become familiar with its presence.
- 5.5 In the 5-year prior period at the Adelaide Road site there was a recorded total of 16 crashes within the search area (including 2 serious crashes and 5 minor crashes). This equates to an average annual crash rate of 3.2 per annum. Following introduction of the digital billboard, there has been just one crash (non-injury), which equates to just under 1 crash per annum. (I further note that in relation to the single recorded crash, it involved two southbound vehicles that side-swiped while changing lanes, and occurred north of the billboard where the billboard would have been fully concealed to both drivers.)
- 5.6 Putting aside for the moment the apparent improvement in road safety that has resulted since the digital billboard became operational, the key point to note from this exercise is that the billboard has in no identifiable way compromised road safety, which appeared to be Dr. Van Houtte's primary concern when particularly bringing the Panel's attention to this billboard.
- 5.7 As explained in my primary evidence, this is not an isolated result insofar that at every site where I have undertaken post-implementation studies, and at other sites that I am aware of that have been studied by others, no evidence of a deterioration in road safety performance has been identified.

6. Conclusion

- 6.1 For all the above reasons, I do not agree with Dr. Van Houtte's suggestion that digital billboards are inherently unsafe to road users, and his reasoning that because some selected research papers predict that digital billboards cannot operate safely, then there must be some insidious characteristic of billboard operations that prevents any road safety effects from becoming evident in practice.
- 6.2 In my opinion, the reality is much simpler. If digital billboards are placed, designed and operated as most of them already are in New Zealand, and with the characteristics that OOHMAA is seeking to have codified into Wellington's Proposed District Plan, then digital billboards can operate as safe and compatible elements of the traffic environments within which they will sit.

Brett Harries

27 March 2024