

Before a Commissioner  
Appointed by the Christchurch City  
Council

Under the Resource Management Act 1991

In the matter of a resource consent application for a free-standing digital  
billboard at 235 Manchester Street (RMA/2020/1877)

---

**Statement of Evidence of Brett Harries**

17 February 2022

---

**Applicant's solicitors:**

Alex Booker  
Anderson Lloyd  
Level 3, 70 Gloucester Street, Christchurch 8013  
PO Box 13831, Armagh, Christchurch 8141  
DX Box WX10009  
p + 64 3 379 0037  
alex.booker@al.nz

**anderson  
lloyd.**

- 1 My full name is Brett Harries.
- 2 I am a New Zealand Chartered Professional Engineer, and am registered as an International Professional Engineer / APEC Engineer.
- 3 I hold a Bachelors degree in Civil Engineering (1982) from the University of Auckland. I have been in professional practise as a specialist consultant traffic and transportation engineer since 1982.
- 4 I am:
  - (a) a Fellow of Engineering New Zealand;
  - (b) a Fellow of the Institute of Transportation Engineers (USA);
  - (c) a Life Member of the Association of Consulting and Engineering (NZ);  
and
  - (d) an Associate Member of the NZ Planning Institute.
- 5 I am currently a Transport Sector Leader for Stantec (NZ) Limited and have held that position for the past four years. Prior to my current position, I worked for Traffic Design Group Limited (TDG), a specialist transportation engineering consultancy. I held various roles within that firm, most latterly as Managing Director for 18 years until TDG's acquisition by Stantec in 2018.
- 6 Over the course of my career, I have been engaged by both public and private sector clients from throughout New Zealand, Australia and the Pacific, to provide designs, assessments and advice on all manner of traffic engineering and transport planning projects.
- 7 Throughout my 39 years' as a specialist transport engineer, I have also gained significant experience and expertise in human factors associated with driver performance and behaviour, and the safety-related driver responses to various traffic environments. Much of this expertise has been obtained through my involvement as an expert vehicle crash analyst / crash reconstructionist. I have qualifications in vehicle crash analysis from Northwestern University in Chicago, and am one of a small handful of practitioners in New Zealand that through qualifications and experience has been accepted as an expert vehicle crash analyst in the High Court of New Zealand.
- 8 I describe this background in crash analysis because it is directly relevant to the assessments I undertake in relation to how drivers might respond and react to a whole range of elements and visual stimuli that make up the

traffic environment, including those that are directly related to the driving task (for example, traffic control devices, other vehicles, etc.), and some of which form parts of the fabric of the wider driving environment (such as surrounding activities, people, scenery, buildings, and of course advertising billboards).

- 9 With regard to experience that is particular to billboards, I have undertaken hundreds of formal assessments of all manner of signs including on-premise advertising (both static and digital); off-premise static signs and billboards; dynamic advertising media such as large balloons, blimps, giant inflatables, buntings, and on-vehicle signs; static and digital bus shelter and pedestrian shelter signs; and digital billboards.
- 10 In addition to the assessments undertaken for consenting purposes, I have also been involved in numerous post-consent reviews of road safety performance at operating billboard sites as part of monitoring consent conditions.
- 11 I maintain my knowledge of the traffic safety implications of static and digital signs and billboards through extensive reading of published papers on the subject; particular visits to many western cities where digital billboards are now an accepted and intrinsic part of the urban fabric; attendance at international conferences where research relating to the traffic safety effects of digital billboards are presented (the latest being the “*7th International Conference on Driver Distraction and Inattention*” held in Paris last year); and participation in post-implementation traffic safety reviews of established digital billboard operations in New Zealand.
- 12 I also participated in a 2012 trial of digital billboard operating characteristics (dwell times, image transition methods and times, and lamination levels) that was held in Auckland during daytime and night-time conditions, and was also attended by various experts from, and consultants representing, Auckland Council, Auckland Transport, and industry representatives.
- 13 My role in relation to Wilson Parking New Zealand's application for consent for signage at 235 Manchester Street, Christchurch has been to provide advice in relation to the traffic safety aspects of the digital billboard proposal (as described in the AEE and its attachments), and to specifically comment on the following matters
  - (a) The adequacy of the information that has been provided in the evidence provided by Mr. Carr, particularly in relation to the assessment of the road safety implications of the proposal, and the sufficiency of information from which a decision can be made.

- (b) To comment on the main area of contention which is in relation to the visual overlapping that will occur between the proposed billboard and the secondary traffic signal.
- 14 In preparing this statement of evidence I have considered the following documents:
- (a) The Assessment of Environmental Effects (**AEE**) prepared by Town Planning Group.
  - (b) The Assessment of Transportation Matters (**TA**) prepared by Mr. Carr that was appended to the AEE.
  - (c) The section 42A report prepared by Council.
  - (d) The traffic assessment prepared by Mr. Downard-Wilke, attached as Appendix 1a to the section 42A report.
  - (e) The summary of submissions, attached as Appendix 4 to the section 42A report.
  - (f) The statement of evidence on traffic prepared by Mr. Carr.
- 15 I have not visited the site of the proposed billboard specifically in relation to this application, but I am familiar with the area, and I have observed video and photographs recorded on 16 February 2022 as provided to me by local Stantec Christchurch staff.

### **Code of Conduct for Expert Witnesses**

- 16 While this is not a hearing before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Executive Summary**

- 17 In my opinion, the analyses undertaken and assessments described by Mr. Carr in his evidence are of an appropriately high technical standard. As best I know, they accurately describe the traffic environment within which the billboard will sit; and they comprehensively describe the likely implications of the billboard on the safety and operation of the target audience of southbound traffic on Manchester Street. I am confident that

the assessments he describes are based on current best practice, and take into account both the practical road safety experience of digital billboard operations in New Zealand, and relevant international research.

- 18 The traffic review of the proposal authored by Mr. Downard-Wilke and included in the section 42A report, is based on the information provided to him in the TA. Mr. Downard-Wilke provides a sound review of the TA, and quickly and appropriately focuses on the issue of visual overlapping between the billboard in the background, and a traffic signal in the foreground, as being the only potential road safety issue. Mr. Downard-Wilke also helpfully brings into focus how the extent of visually overlapping should be measured.
- 19 Having now read Mr. Carr's evidence alongside Mr. Downard-Wilke's traffic assessment, there now appears to be comparatively little difference between the two when considering the extent of the Manchester Street southbound approach to Gloucester Street that will be affected by the visual overlapping. Where the assessments differ however, (and it appears to be the single potential issue of contention), is in the interpretation of whether that visual overlapping will lead to adverse road safety effects.
- 20 In this regard, it is my opinion that Mr. Carr has appropriately examined the likely implications of the visual overlapping by applying an evidential approach to his assessments, which has involved:
  - (a) drawing upon the generally observed road safety implications of digital billboards in New Zealand;
  - (b) examining locations in New Zealand where similar visual overlapping occurs between a traffic signal and a digital billboard; and
  - (c) referring to international research.
- 21 Somewhat by contrast, Mr. Downard-Wilke has applied a presumption-based approach with a series of 'what-if' scenarios, with no evidentiary basis to those scenarios. The conclusion he reaches is that the proposal "*may create risk, with the most significant consequences arising from a driver not noticing the signals changing away from green*", from which he concludes non-support for the proposal.
- 22 My evidence therefore provides an independent, objective evaluation of the issue of visual overlapping, with a particular focus on context, and what can reasonably be expected from drivers when within the area where visual overlapping occurs. This requires consideration of expected driver behaviours and anticipated driver responses to the traffic environment

when on the southbound approach. The conclusion I reach is that the proposed mid-block location of the billboard is a good one, and the extent of visual overlapping that will occur will have no discernible adverse impact on either driver behaviour or driver performance that could in any way impact on road safety at the Manchester Street / Gloucester Street intersection.

## **Evidence of Mr. Carr**

### *Context*

- 23 I have reviewed the traffic-related statement of evidence of Mr. Carr. In reviewing this evidence, I have considered:
- (a) the relevance, completeness, accuracy and understanding of the assessments that are provided;
  - (b) the applicability of the evidence in relation to the current state of international knowledge regarding the road safety implications of digital billboards; and
  - (c) the accuracy and relevance of the assessments undertaken of the visual relationship between a southbound driver's view of the secondary traffic signal (also referred to as signal pole 5).

### *Road Safety Records*

- 24 In his Paragraph 29, Mr. Carr refers to the road safety record on Manchester Street for a distance of 100m either side of the proposed billboard, which includes the two signalised intersections at Gloucester Street and Worcester Street. Mr. Carr notes that an updated search (2021 to present) showed no additional crashes from the four crashes recorded in the 2015-2020 search period as reported in his TA.
- 25 In order to verify the road safety record in the area, I undertook my own search within the same 200m length of Manchester Street for the five-year period 2017 to present. The search revealed just the one crash (noting that the other three recorded by Mr. Carr occurred prior to 2017). The single identified crash occurred midblock on Manchester Street south of Gloucester Street, and involved a diabetic driver who suffered a medical event and lost control of his vehicle.
- 26 In my view, the lack of any recorded crashes on the Manchester Street approach to Gloucester Street, or at the Manchester Street / Gloucester Street intersection, is significant, because it clearly demonstrates that there are no inherent road safety issues with either the layout or operation of the

traffic environment that could otherwise potentially influence the acceptability or otherwise of the proposed billboard from a road safety perspective.

### *Research*

- 27 In his paragraphs 30 and 31, Mr. Carr summarises the current state of international research with regard to the road safety implications of digital billboards. More detailed descriptions of that research are described in Section 3.2 of his TA. I am familiar with the research that he has cited, and consider that he has referred to the studies that are most relevant to the nature of the billboard that is proposed in this application. I also consider that he has fairly and appropriately summarised that research.
- 28 I would note in this regard the importance of referring to research that is applicable to the way that digital billboards are operated in New Zealand. This point is often missed by many well-meaning practitioners who will undertake a web search of any and all articles and papers related to digital billboards without any consideration of their relevance. There are numerous papers that conclude that digital billboards do have some potential to generate adverse road safety effects, but when examined in detail it is often revealed that they are based on digital billboard studies that include characteristics that we do not apply in New Zealand, such as full-motion video for example.
- 29 In terms of the outcomes of the review of research that Mr. Carr has described in his paragraph 31, I concur with his opinion that if applied to this proposal, then it can be concluded that it will be unlikely that adverse safety-related effects will arise from the operation of the proposed billboard.

### *Visual overlapping of the secondary traffic signal with the billboard*

- 30 The bulk of the remainder of Mr. Carr's evidence responds to the primary concern expressed by Mr. Downard-Wilke that a visual overlap of the secondary traffic signal with the billboard 40m behind it, as viewed by drivers on the Manchester Street southbound approach to the Gloucester Street intersection, will create such an unsafe situation that it is unable to be supported.
- 31 What appears to be common ground in the assessments described by Messrs Downard-Wilke and Carr are that:
- (a) The visual overlap occurs with the secondary traffic signal only. None of the remaining three traffic signals are affected in any way.

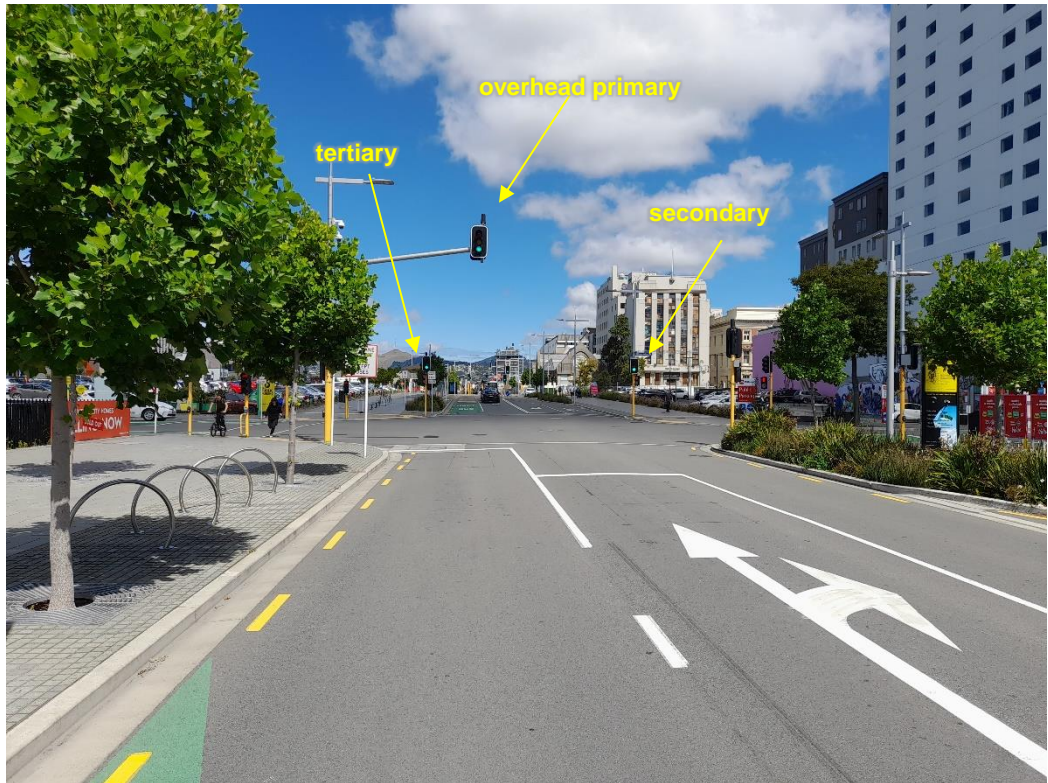
- (b) The distance calculated from the southbound limit line that represents the point that drivers travelling at 30km/h will likely proceed through the intersection rather than attempt to stop in response to a change of signal, is 22m. (This distance is determined from the 'ASD' calculation as described by Mr. Downard-Wilke).
  - (c) The section of the approach just prior to the 22m line is considered as the 'critical decision-making area'. This is the area of road where drivers who see a signal change will have the ability to perceive and react to that signal change in sufficient time to bring their vehicle to a stop at the limit line.
  - (d) The visual overlapping that occurs within the general traffic (inner) lane only occurs within the 22m ASD area where a driver would proceed through the intersection regardless of a signal change occurring. Accordingly, the general traffic lane can be deemed to be 'unaffected' by the visual overlapping.
  - (e) However, the bus (outer) lane has visual overlapping that extends 20m beyond the 22m ASD area, and can therefore be deemed to be potentially influenced by the visual overlapping.
  - (f) Austroads defines the main function of a secondary traffic signal to be a 'start function', i.e. to inform drivers who are stationary when they may move off. Its main function is not a 'stop function', but obviously it does contribute to the overall stop function message of the traffic signal group as a whole. Austroads defines the primary and overhead primary signals (at the near-left corner of the intersection), as providing the main 'warning' and 'stop' functions.
- 32 While apparently not agreed between Messrs Carr and Downard-Wilke, I concur with Mr. Carr that the analysis of visual overlapping is only applicable to the horizontal plane. In other words, the relative height of a vehicle driver makes no difference to the extent of visual overlapping that will occur.
- 33 My assessment of the issue of visual overlapping is as follows:
- (a) Even if a driver has attention drawn toward the digital billboard, and hence the secondary signal, this does not make the other signals invisible. During summer, all but the standard primary will be visible (it is obscured by trees in summer when viewed from within the bus lane); and in winter all four signals will be visible to a driver. In both summer and winter, the secondary signal, being on the right side of the road, is furthest from a driver's central vision. At all times the



overhead primary dominates, being the most prominent given that it remains squarely within central field vision when viewed from within the critical decision-making area. This applies regardless of whether a driver's focus is toward the direction of the billboard or not. This can be seen in the two photographs below. The top photograph is taken from a distance of 32m from the limit line, which is midway through the 20m critical decision-making area; while the bottom photograph is taken from a distance of 22m from the limit line which is at the end of the critical decision-making area. When looking at each of the photographs, it is clearly apparent that it would be particularly difficult for a driver to not be aware of the overhead primary signal.



*Southbound view 32m from limit line (midway within decision-making zone)*



*Southbound view 22m from limit line (end of decision-making zone)*

- (b) At the distances encompassed by the critical decision-making zone (i.e. 22m to 42m from the limit line), the billboard will be between 92m and 113m from the driver. At these distances, the billboard will not be distinct or visually dominating; and it will be of little interest to a driver given that screen content typically does not start to become legible until within 80-100m from the screen. Even its presence due to its lumination will be of little attraction, and certainly less than the inherently much brighter traffic signal lantern that is some 40m closer, and which is shielded from its background by its black backing board.
- (c) As described in Mr. Carr's evidence, the end of the critical decision area coincides with the end of the bus lane. This means that the vast majority of vehicles that pass through the critical decision-making area will be bus drivers, with only occasional illegal use by car drivers. Once drivers are in the legal extent of the outer lane, they will also be beyond the critical decision-making area, and therefore unaffected by any visual overlapping. Bus drivers will be very regular users of this road, and as professional drivers will be least likely to be 'distracted' in any way by the presence of the proposed billboard.
- (d) Mr. Downard-Wilke has raised the scenario of drivers attempting to avoid a waiting right-turner by using the bus lane to bypass any queue on the inside, and to then illegally proceed straight through the

intersection from the left-turn-only lane. A driver making such a lane change manoeuvre will unlikely have any opportunity to look at or toward the billboard while doing so, because it would require looking in a direction other than that required to undertake such a manoeuvre, which is particularly difficult to achieve in practise. The scenario also assumes that any potential view of the billboard is not going to be obstructed by the queued vehicles that the driver is passing. While the scenario described is not impossible, if it did occur it would be a rare event, and even then the overhead primary lantern would remain the most prominent one for that driver, as shown in the two photographs above.

- (e) Mr. Downard-Wilke has also raised the prospect that a colour blind driver could potentially miss a change from a green signal to an amber signal, especially if at the very instant that the signal change occurred, an image on the billboard that just happened to be predominantly green, changes in that same instant to another image that just happens to be predominately amber. Aside from the incredulous odds of such a set of circumstances occurring, the scenario ignores the facts that the primary overhead will still be most dominant to that driver; that even colour blind drivers are able to distinguish each traffic signal by a combination of hues and the position of the lantern that is lit; and that image changes on the billboard will occur by way of a 0.5-second dissolve transition that is not instantaneous and would therefore be visually distinguishable from a change with the traffic signals.
  - (f) Mr. Downard-Wilke has referred in Section 3.1.2 of his report to right turning drivers being more likely to look at the secondary signal. That is correct. However, I concur with Mr. Carr that right turners will be doing so from the general traffic lane, which is not impacted by any overlapping of the billboard within the critical decision-making zone.
- 34 Accordingly, and with respect, I do not agree at all with the assessments described by Mr. Downard-Wilke, principally because they involve a series of presumptions and 'what-if's' that are not based on evidence or research, and lack any material credibility.
- 35 I am also concerned because the scenarios described by Mr. Downard-Wilke require a series of extraordinary coincident events including some or all of the following:
- (a) a colour-blind driver;

- (b) who has illegally manoeuvred from the general traffic lane into the bus lane;
- (c) in order to either turn left or to illegally proceed straight through the intersection from the left turn lane because a right-turning vehicle is blocking the general traffic lane;
- (d) and who while looking in the direction of the proposed billboard while undertaking the lane-change manoeuvre fails to notice the overhead primary or tertiary signals which will be directly ahead in central vision;
- (e) and while still within the critical decision-making zone experiences a change in the traffic signals from green to amber;
- (f) at exactly the same instant that the billboard image changes (by way of its 0.5 second dissolve), from an image that just happens to be predominantly green in colour;
- (g) to another image that just happens to be predominantly amber in colour;
- (h) which cause the driver to fail to notice the change in traffic signal despite the inherent brightness of the traffic signal which is also shielded by its backing board from the billboard screen that sits a further 40m behind, and
- (i) despite the presence of the other traffic signals that sit directly ahead, proceeds to travel through the intersection, unaware that it is through an amber or red signal.

36 I would suggest that such an extraordinary set of coincident circumstances would be so far-fetched and unrealistic that it would need to be described as fanciful, and certainly not even a low probability event.

### **Proposed consent conditions**

37 I have reviewed the traffic-related conditions that have been proposed by the Applicant. I agree with the nature and wording of those conditions. I have no further suggested modifications or additional conditions that would be necessary to ensure that the traffic safety effects of the proposed billboard are adequately and properly addressed.

## **Conclusion**

- 38 Having carefully reviewed the evidence prepared by Mr. Carr, and the Traffic Report prepared by Mr. Downard-Wilke, it is apparent that the only issue in real contention is the likely road safety consequence of a 20m extent of visual overlapping from the kerbside bus lane approach to the intersection with Gloucester Street.
- 39 Having undertaken my own independent assessment of that issue, I agree with Mr. Carr that "*it is very unlikely that adverse safety-related effects will arise from the operation of the billboard*"; and I do not agree with Mr. Downard-Wilke that the proposal will result in road safety effects that make the proposal unsupportable.
- 40 Accordingly, it is my opinion that there is no traffic engineering or road safety reason to preclude acceptance of this proposal, and that the likely resultant effects of the proposed billboard to the function, performance and safety of the local traffic environment, will be no more than minor.

**Brett Harries**

Dated this 17 day of February 2022