IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of a resource consent application to **TASMAN DISTRICT COUNCIL** by **BEKON MEDIA LIMITED** to install a digital billboard at 322 Queen Street in Richmond.

STATEMENT OF EVIDENCE OF BRETT HARRIES

1. INTRODUCTION

1.1 My full name is Brett Harries.

1.2 I am a director of Harries Transportation Engineers Limited which is a specialist transportation engineering consultancy that I founded in 2021. Prior to my current role, I was:

a) Market Leader - Transport for Stantec (NZ) Limited from 2018 to 2021; and

b) Traffic engineer and ultimately Managing Director of Traffic Design Group Limited from 1982 to 2018.

Qualifications and experience

1.3 I am a New Zealand Chartered Professional Engineer and am registered as an International Professional Engineer / APEC Engineer.

1.4 I hold a Bachelor of Civil Engineering degree from the University of Auckland (1982).

1.5 I have 43 years' post graduate professional experience as a practising specialist traffic and transportation engineer.

1.6 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.

1.7 Throughout my career as a specialist transportation engineer, I have been engaged by both public and private sector clients from throughout New Zealand, Australia and the South Pacific to provide designs, assessments and advice on all manner of traffic engineering and transport planning projects.

1.8 As part of this broader experience, I have gained significant experience and expertise in human factors associated with driver behaviour, and the safety-related driver responses to various traffic environments. Much of this expertise has been obtained through my involvement as an expert forensic vehicle crash analyst. I have qualifications in vehicle crash analysis from Northwestern University in Chicago and am one of a small handful of professional engineers in New Zealand who, through qualifications and experience, has been accepted as an expert vehicle crash analyst in the High Court of New Zealand.

1.9 I describe this background in crash analysis because it is directly relevant to the assessments I routinely undertake in relation to the driver behavioural and performance responses to potential visual stimuli that make up the traffic environment, including those that are directly related to the driving task (for example, traffic control devices, other road users, road layout, etc.), and those that form part of the fabric of the wider driving environment (such as surrounding activities, people, scenery, buildings, and of course advertising signs and billboards).

1.10 With regard to experience that is particular to the assessment of the road safety effects of signs and billboards, I estimate that over the past 13 years I have undertaken or contributed to the formal assessment of over 350 digital signs and billboards throughout New Zealand.

1.11 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 digital sign and digital billboard sites, typically as part of monitoring conditions of consent.

1.12 I have presented expert evidence on the traffic engineering and road safety implications of signs and billboards on numerous occasions throughout New Zealand.

1.13 I maintain my knowledge of the traffic safety implications of digital billboards through extensive reading of published papers on the subject; and through regular attendances at international conferences where research relating to the traffic safety effects of digital billboards are presented, the latest being the "*5th International Conference on Driver Distraction and Inattention*" held in France in 2021.

1.14 I also participated in a 2012 trial of digital billboard operating characteristics (dwell times, image transition methods and times, and luminance levels) which 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.

1.15 From the knowledge I have accumulated throughout my career that is specific to the potential road safety implications of signs and billboards (particularly digital billboards), I have gained a sound appreciation of the distinction between commonly-held perceived effects, versus those that are evident in practice. This understanding is crucial, because even amongst traffic engineering professionals there can be a disconnect between assumed and actual driver responses to external elements such as signs and billboards, which then leads to a wide mismatch between the assumed and actual road safety outcomes due to those elements.

Involvement in the application

1.16 I was engaged by Bekon Media Limited ("Applicant") in February 2024 to peer review the traffic assessments undertaken by the Applicant's consultant traffic engineer, Andy Carr of Carriageway Consulting, in relation to a proposal to establish a single-sided roof-mounted digital billboard at the northwestern corner of 322 Queen Street in Richmond ("Application").

1.17 My evidence in relation to this application builds upon that initial work by providing a peer review of the evidence of Mr Carr, along with comments where necessary to assist the Commissioner to understand why there are differences in the opinions reached, particularly between those described by Mr Carr, and those described by submitters, (including the submission from Waka Kotahi NZ Transport Agency ("NZTA")) and by the Tasman District Council's ("TDC") consultant traffic specialist.

1.18 The key assessments and reports I have reviewed for the purpose of undertaking my analysis and producing my evidence include:

a) *Proposed Digital Billboard, Queen Street, Nelson – Assessment of Transportation Matters,* dated 21 May 2024, prepared by Andy Carr of Carriageway Consulting, as lodged with the Application ("ATM");

b) *Application for resource consent to the Tasman District Council - land use consent to establish a single-sided, 24.5m2 digital billboard for off-site advertising at 332 Queen Street, Richmond*, dated 21 May 2024, prepared by Town Planning Group (NZ) Ltd, as lodged with the Application ("AEE");

c) Various *Submission on Resource Consent Application* forms as received by TDC from lay submitters;

d) The NZTA submission, dated 14 October 2022, prepared by Jeremy Talbot for NZTA;

e) The TDC Section 42A report prepared by Victoria Woodbridge for the purposes of the consent hearing ("s42A report");

f) The *Consent Application RM230535, 332 Queen Street, Richmond – Review of Traffic Effects* dated 19 September 2024 prepared for TDC by Ari Fon of Affirm NZ Ltd ("TDC Traffic Review");

g) The Town Planning Group letter of 7 October 2024 from Ms Collie advising TDC of proposed amendments to the application;

h) *Proposed Digital Billboard, 322 Queen Street: Proposed Reorientation,* dated 4 October 2024, prepared by Andy Carr; and

i) The statement of evidence of Andy Carr, dated 17 October 2024 ("Mr Carr's evidence").

1.19 I am familiar with the site and its environs and last visited the site specifically in relation to this proposal on Thursday, 22 August 2024.

Purposes and scope of evidence

1.20 The purposes of my evidence are generally threefold:

a) To provide a general overview of the current state of applicable New Zealand and international research regarding the road safety implications of, and the optimum operating characteristics for, digital billboards of the nature proposed in this application.

b) To provide:

(i) comments on the assessments described by Mr Carr in his statement of evidence as a result of my peer review of those assessments; and

(ii) additional analyses and assessments where they may assist in the understanding of the road safety implications of the proposal.

1.21 Accordingly, my evidence provides:

a) A brief summary of the key elements of the proposal (Section 3);

b) A brief review of the nature of the traffic environment (Section 4);

c) A summary of the international research basis for the assessment of digital billboards, with a particular focus on the research that is appropriate and relevant for New Zealand conditions (Section 5);

d) A detailed examination of the actual road safety implications of advertising signs in general, and digital billboards in particular, by reference to the New Zealand crash database (Section 6);

e) A review of consistency with the traffic engineering requirements of the Tasman Resource Management Plan (Section 7);

f) A brief review of Mr Carr's assessments of the proposal against the locational and operational recommendations contained within the NZTA *Traffic Control Devices Manual – Part 3 – Advertising Signs (2011)* ("TCDM3") (Section 8);

g) Response to the road safety matters raised by submitters, including NZTA, (Section 9);

h) Comments on the TDC Traffic Review (section 10);

i) Comments on the proposed conditions of consent as offered by the Applicant (Section 11); and

j) My conclusions (Section 12).

1.22 A summary of my evidence is provided in Section 2.

Expert Witness Code of Conduct

1.23 Counsel for the Applicant has provided me with a copy of the Code of Conduct for Expert Witnesses as contained in the Environment Court's 2023 Practice Note. I can confirm that I have read it, and I agreed to comply with it. In particular, I can confirm that this evidence is within my area of expertise, and that I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

2. SUMMARY OF EVIDENCE

2.1 In my road safety assessments of this proposal, my starting point has been to reference relevant international research that is applicable to the manner that digital billboards operate in New Zealand, and to then build upon and ground-truth that research by examination of digital billboard safety performances from the New Zealand recorded crash database, and by reference to road safety monitoring studies that have been undertaken at numerous individual billboard sites. In this regard, I note that there are now over 1,000 digital advertising screens located in towns and cities throughout New Zealand[1] that have been developed over the past 12+ years. There is, therefore, a wealth of digital billboard operational experience in New Zealand from which road safety conclusions can be confidently derived.

2.2 Without a sound appreciation of either the complexities associated with the interpretation of the research data, or the applicability of that research to New Zealand conditions, it might seem at first glance that the research is contradictory, and sometimes even unsupportive of digital billboards from a road safety perspective. However, when appropriate weight is given to empirically derived research that is applicable to the New Zealand context, a clearer picture emerges.

2.3 The research I describe in my evidence reveals, amongst other things, that:

a) Even within complex traffic environments, digital billboards are not inherently distractive to drivers to the extent that they cause a deterioration in road user behaviours or driver performances that could then lead to road safety effects. Indeed, Australian research that I will describe reveals that drivers are inherently able to self-regulate and

[1] The 1,000+ digital screens consist of generally equal proportions of large format digital billboard screens, and smaller format digital advertising screens (such as often incorporated into bus shelters, pedestrian shelters, EV chargers, etc.).

prioritise their attention to the matters necessary for the driving task (such as the presence of other road users, for example), and will de-prioritise their attention to matters that are unnecessary for that task (such as looking at advertising, for example). This enables drivers to safely negotiate their way past digital billboards in more complex traffic environments with no apparent reduction in driving performance or road safety.

b) While some drivers can and do glance at digital billboards, those glance durations are little different from those made to any other sort of external element of the driving environment (such as people, buildings, roadworks, roadside activities, shops, and so on), and such glances are not of a duration that result in any measurable adverse road safety effects.

2.4 An important tool that is available to measure the road safety implications of digital billboards in New Zealand is the NZTA Crash Analysis System ("CAS") national database of all recorded crashes (both non-injury and injury). While CAS records only those crashes that were reported to or attended by the New Zealand Police, it is an invaluable source of crash information from which road safety patterns can be confidently derived. CAS is routinely referred to and applied by all road controlling authorities throughout New Zealand, including TDC.

2.5 I have examined CAS for the whole of New Zealand for the period since digital advertising screens first appeared in New Zealand in 2012 and have used the searchable crash factor "*attention diverted by advertising or signs*".[2] That search revealed zero crashes that were attributable to digital advertising screens. That outcome, in and of itself, speaks volumes regarding the relative safety of digital billboards in New Zealand.

2.6 The evidence-based approach I have adopted by reference to relevant research and recorded crash data, differs from the approach taken by a number of submitters, the TDC traffic review, and the NZTA submission which include perception-based descriptions of the road safety implications of digital billboards, generally without any supporting empirical evidence or data. The impression given is that the proposed digital billboard and its receiving traffic environment are in this case somehow so unique that it is not possible to evaluate it against the 1,000+ existing digital advertising screens that currently operate throughout New Zealand, the vast majority of

[2] CAS contributing cause factor code 356.

which are located at or proximate to busy and/or complex intersections. I do not consider that to be the case at all.

2.7 My examination of the specifics of this proposal reveals that, subject to the conditions of consent proposed by the Applicant as appended to the evidence of Ms Collie, the establishment of the proposed digital billboard would be unlikely to generate additional distractive effects to motorists to the extent that such effects would result in any measurable deterioration to the safety, function, or performance of the local traffic environment.

2.8 My review of Mr Carr's evidence confirms that, in my opinion, he has undertaken a thorough and objective evaluation of the proposal. The descriptions and assessments that he has provided have been completed using appropriate methodologies and good engineering practice. Having undertaken my own assessments of the proposal, I am able to concur with and adopt the conclusions he reaches as summarised in Section 2 of his evidence.

2.9 In summary, it is my opinion that:

a) Current research related to the manner in which digital billboards operate in New Zealand indicates that the proposed billboard can be compatibly and safely integrated into the traffic environment within which it will be located.

b) The research shows that while some drivers can and do choose to glance at digital billboards, those glance durations are sufficiently brief to ensure that they do not become a distraction to the driving process to the extent that it could lead to adverse road safety outcomes. This finding is amply demonstrated in practice by the fact that over the past 12+ years of digital billboard operations in New Zealand, there have been no recorded crashes that suggest in any way that the presence of a digital billboard has been a contributing factor.

c) In this case, the design, placement and operation of the proposed digital billboard will ensure that it can be compatibly and safely integrated into its traffic environment. In this regard, the Applicant's intention to re-orient the billboard away from Lower Queen Street to be predominantly directed at Gladstone Road, and the intention to increase dwell time to 30-seconds, should, together, on any objective analysis, address most (if not all) of the traffic-related concerns as expressed by submitters, NZTA and the TDC Traffic Review.

d) The proposed adoption of a minimum 30-second dwell time for image displays as now proposed is entirely appropriate to ensure the safe and acceptable operation of the billboard within this particular traffic environment. Significantly, both international research and operational experience in New Zealand now confirms the acceptability of this dwell time. In this case there is certainly no technical justification for, or road safety advantage to, requiring a minimum dwell time that is greater than 30 seconds at any time of the day.

2.10 Having considered the relevant international research and applied the knowledge and experience of digital billboard operations in New Zealand, it is my opinion that there are no material traffic engineering or road safety reasons that would preclude a grant of consent for the amended digital billboard as now proposed.

3. THE PROPOSAL

3.1 The traffic-related aspects of the proposal have been described in detail in Mr Carr's TA, his report on the amended proposal, and in section 3 of his evidence. From a transportation perspective, my understanding of the relevant traffic-related elements of the proposal include the following:

a) The billboard will be single-sided and landscape oriented with dimensions of 7m width by 3.5m height.

b) The billboard will be roof mounted within a supporting parapet. The height above ground level to the underside of the screen will be about 5.3m, giving an overall height to the top of the screen of 8.8m.

c) In the original application it was proposed that the billboard would be directed toward both the Lower Queen Street southbound and Gladstone Road eastbound approaches to the Gladstone Road / Queen Street / Richmond Deviation (SH6) / Lower Queen Street intersection ("subject intersection"). However, with my support, that original orientation has subsequently been amended to now be angled away from the Upper Queen Street southbound approach so that it is primarily directed only toward the Gladstone Road (SH6) eastbound approach. Some limited glimpses of parts of the screen may potentially still be available from Lower Queen Street and Queen Street, but these will be incidental and of little or no practical consequence. The screen will not be visible at all from the Richmond Deviation.

d) In the original application it was proposed that the billboard would operate with a minimum image dwell time of 8 seconds. However, that dwell time has subsequently been amended, again with my support, so that a minimum image dwell time of 30 seconds is now proposed.

e) The images displayed will remain static while they are displayed; and the transitions between images will involve a 0.5-second cross-dissolve.

f) The screens will operate with luminance maxima of 5,000cd/m² during daylight and 150cd/m² during night-time. Luminance will also be automatically managed to be responsive to ambient light conditions.

3.2 In point c) above, I have noted that the proposed re-orientation of the billboard screen away from Lower Queen Street will result in little or no interest in viewing by southbound road users.

3.3 In his evidence, Mr Carr has explained in detail what is likely to be seen of the screen from the very acute viewing angles that will remain on the Lower Queen Street approach.[3] I have independently examined Mr Carr's analyses, and can confirm that from a viewing angle of about 20°, image content is not legible, so that there will be little or no interest from road users to attempt to look at the image.

3.4 The diagram below shows a V-oriented billboard that I examined, where the screen on the right is viewed from largely head-on, while the screen on the left is viewed at an angle of 20°. The same image and same luminance occurs on both screens. As evident in my example, the presence of an image on the left screen is apparent, but it is certainly not legible. It also appears noticeably darker than the screen on the right. As a motorist, if all I had to look at was the screen on the left, I simply would not bother. I therefore concur with Mr Carr's evidence in this regard.

[3] EIC Andy Carr, paragraphs to 3.10 to 3.17.

3.5 Accordingly, I fully support the amended orientation and operation of the proposed billboard. Its operational characteristics are tried-and-true and, along with the re-orientated screen as now proposed, will enable its safe and compatible integration into its traffic environment.

4. THE TRAFFIC ENVIRONMENT

4.1 Section 2 of the TA and section 4 of Mr Carr's evidence describe the traffic environment within which the proposed billboard will be established, with descriptions of the geometries of the roads and adjacent intersection, traffic signal layouts, traffic volumes, applicable speed limits, and road safety history. I generally concur with his descriptions.

4.2 As Mr Carr has described, both Gladstone Road and Lower Queen Street operate with a speed limit of 50km/h. While not noted by Mr Carr, Queen Street operates with a different posted speed limit of 30km/h given its function as part of Richmond town centre's road network.

4.3 I further note from my own investigations and observations that:

a) Given the various traffic demands that the intersection is required to accommodate, its layout is appropriate and suitable, although I suspect that the existing Give Way controlled left turn slip lane from Lower Queen Street into Gladstone Road would likely be reviewed if the opportunity ever arose to upgrade / modernise the intersection.

b) I observed that the operations of the traffic signals are appropriate to manage the traffic demands that the intersection is required to accommodate.

c) While the road safety history at the subject intersection is comparatively poor when compared to other intersections in Richmond, this appears to be more a function of the volume and nature of traffic that passes through the intersection, rather than any inherent deficiency in either the design or operation of the intersection. When compared to other comparable State highway urban connector arterial intersections throughout New Zealand, its road safety performance is largely as would be expected. I further discuss the crash history at the intersection in paragraphs 4.6 to 4.10 and 10.2 to 10.11 below.

d) All four approach roads to the intersection are appropriately open and clear, with good sight lines through the intersection, and good inter-visibility between motorists and the numerous vulnerable road users (pedestrians, cyclists and mobility scooterists) that use the intersection. This includes the Give Way controlled left turn from Lower Queen Street into the Richmond Deviation, which is open and uncluttered, and provides good advance visibility of any pedestrians using the zebra crossing on that left turn.

e) The visual environment that road users experience when approaching the intersection is one characterised by its town centre fringe location. This means that road users are exposed to:

    (i) consistently busy traffic conditions;

    (ii) a range of retail / commercial / restaurant activities with their associated on-premise signage;

    (iii) side-friction by way of driveway movements and nearby intersection movements; and

    (iv) the presence of all road-user types.

f) Whilst being a visually busy traffic environment, I do not consider it to be a noticeably difficult or complex one for road users to negotiate, and certainly do not consider that it would be sufficient to cause road users to become overwhelmed to the point that it adversely impacts on driving performance.

4.4 Based on all these observations and considerations, I concur with Mr Carr's opinion[4] that the introduction of a digital billboard into this traffic

[4] EIC Andy Carr, paragraph 2.13.

environment will not present any particular road safety concerns provided that suitable controls on its operation are put in place. I say this because the location and operation of the billboard would in my opinion be unlikely create conditions that could compromise the road safety performance of the intersection.

4.5 Section 2.3 of the ATM provides a five-year summary of crashes within 100m of the approaches to the proposed billboard, and paragraphs 4.13 to 4.19 of Mr Carr's evidence provides a detailed update to that crash search which reflects the re-orientation of the proposed billboard. I am able to verify the veracity of Mr Carr's investigations in this regard.

4.6 One key feature of the crash records that became immediately apparent to me was the noticeable proportion of crashes where the 'at-fault' driver has approached the intersection from the Richmond Deviation approach. A likely reason for this is that prior to reaching the intersection from that direction, drivers have been on a 100km/h expressway that transitions to 50km/h about 375m from the intersection. In this regard, I note that five of the seven crashes that involved a driver running a red light did so where the at-fault driver had approached from the Richmond Deviation. I also note that the proposed billboard will not be visible to traffic on the Richmond Deviation approach to the intersection.

4.7 Over the past five years, two crashes within the search area involved a pedestrian. One of these occurred at the McDonalds driveway on Lower Queen Street about 40m west of the intersection. The other involved a pedestrian crossing the Richmond Deviation approach to the intersection from west to east, where the pedestrian attempted to cross on a red signal through moving traffic. At neither location would the proposed billboard be visible.

4.8 Overall, in relation to the road safety performance of the intersection, I concur with Mr Carr's assessment that notwithstanding the existing presence of crashes at the intersection (as typically occurs at any signalised intersection of arterial roads), there do not appear to be any particular inherent road safety deficiencies that the proposed billboard is likely to further compromise, or that would preclude the appropriately safe operation of the proposed billboard. I expand on this point further in response to the TDC Traffic Review in paragraphs 10.2 to 10.11 of my evidence below.

4.9 I also note that NZTA's Safe Systems "MegaMaps" tool does not show the intersection as a 'blackspot' location. Rather, it shows its assessments of

Infrastructure Risk[5] (medium), Collective Risk[6] (medium) and Personal Risk[7] (medium-low) for Gladstone Road as all falling within generally expected parameters for a State highway urban arterial road.

5. RESEARCH BASIS FOR THE ASSESSMENT OF DIGITAL BILLBOARDS

Research relevance

5.1 Paragraphs 5.1 to 5.19 of Mr Carr's evidence provide a succinct summary of the substantial body of available international research that relates to digital billboards. From his examination of that research, Mr Carr found that the supporting arguments for a link between road safety and digital billboards to be not particularly compelling, and that:

> *"Taken overall, my view is that the published research does not:*
>
> *(a) Show a demonstrated link between the presence of digital billboards and an increase in the number of crashes recorded, for the way in which the billboard will be operated in this instance.*
>
> *(b) Provide supporting arguments for any compelling link between adverse road safety effects and digital billboards"*[8]

5.2 I would further note in relation to the available international research that it varies significantly in terms of its age, relevance, and the extent that it has been validated to actual digital billboard operations. This has led to inconsistent, if not sometimes contradictory, research outcomes as Mr Carr has described. In this regard, and as Mr Carr has noted[9], it is important to recognise the difficulties associated with assuming that all research is relevant.

5.3 Further points that I note in this regard are as follows:

a) Much of the earlier research in relation to digital billboards was based on theoretical and/or driver simulation studies that attempted to make

5 **Infrastructure risk** is the likelihood that the physical environment—such as road design, traffic controls, or adjacent structures—could contribute to a road crash or amplify the severity of a crash.

6 **Collective Risk** highlights which road links have a high number of fatal and serious crashes on them – which can be used to help determine where the greatest road safety gains can be made from investment in engineering.

7 **Personal Risk** shows the likelihood of a driver or rider, on average, being involved in a fatal or serious road crash on a particular stretch of road.

8 EIC Andy Carr, paragraph 5.20.

9 EIC Andy Carr, paragraph 5.15.

inferences about the potential safety effects of billboards without 'real-world' validation. For example, researchers often attempted to extrapolate road safety effects from secondary factors such as glance durations, changes in vehicle tracking when passing a billboard, changes in vehicle headways, and so on. However, these various characteristics were rarely ever validated by correlating the predictive characteristics being examined to any actual identifiable impact to road safety. In fact, some studies showed that the opposite was the case, as I explain later in my evidence.

b) Many studies have involved examination of the implications of driver behaviours / driver responses relative to digital billboards that have largely uncontrolled operational characteristics, that can, in turn, produce a range of effects that may indeed be potentially distractive when compared to current New Zealand digital billboard operations. Some billboard characteristics associated with these studies include:

    (i) poor placement and alignment of the billboards; and/or

    (ii) overly bright displays; and/or

    (iii) inappropriate image transitions; and/or

    (iv) dynamic display elements, most particularly animation or full-motion video.

c) These operational characteristics are often quite different from the much more tightly bound operational characteristics that apply in New Zealand, wherein, in the vast majority of cases, we have:

    (i) strict limits on maximum luminance levels;

    (ii) managed luminance that is responsive to ambient lighting conditions;

    (iii) images that are static while being displayed;

    (iv) dwell times that are set by reference to the traffic environment (typically 8-seconds in urban areas); and

    (v) 0.5-second dissolve transitions between images.

d) The upshot is that many studies, especially those undertaken in countries that can have quite different and variable operational characteristics, can produce results that have only limited (if any) relevance to New Zealand.

5.4 As the research in relation to the road safety effects of digital billboards can be inconsistent, I have looked closely at all of the available research but have given more weight to studies that are based on empirically derived evidence in preference to inferred evidence; and, perhaps more importantly, research that relates to the manner in which digital billboards operate in New Zealand. Simply accessing Google and adopting an overseas study without proper consideration as to its relevance and applicability to New Zealand billboard operations and traffic conditions is generally unhelpful, especially if its consideration of 'digital billboards' includes animated and/or full-motion screen content.

5.5 For all these reasons, I have looked more closely at recent, predominantly Australasian-based research on the basis that billboard operational characteristics, traffic environments and traffic conditions will more likely be comparable and relevant. Some of the key research papers are briefly summarised below.

Relevant and applicable international research

5.6 An Australian study by Samsa (2015)[10] describes experiments that involved comparative assessments of driver responses to the presence of on-premise advertising signs[11], static billboards, and digital billboards. The research found that:

> *"Generally, participants tended to fixate most on the road ahead when driving, which is a positive finding in terms of road safety. There were also no differences in this on-road viewing between the three signage types",* [i.e. on-premise advertising signs, standard billboards and digital billboards].
>
> *"When participants looked at billboards and on-premise signs, the average fixation durations were all well below 0.75s, which is considered to be the equivalent minimum perception-reaction time to the slowing of a vehicle ahead".*
>
> *"In regard to driver performance variables, the data showed no significant differences in average vehicle headway for any of the signage types", and "… the headways found in the present study would have given drivers enough time to detect the slowing of a vehicle in front and respond accordingly".*
>
> *"… the findings show that digital billboards do not draw drivers' attention away from the road for dangerously long periods of time compared to other signage types, and*

[10] Samsa, C. (2015) "*Digital billboards 'down under': are they distracting to drivers and can industry and regulators work together for a successful road safety outcome*?" Proceedings of the 2015 Australasian Road Safety Conference 14 – 16 October, Gold Coast, Australia.

[11] On-premise signs are first-party signs that relate to the activity within the site on which they are located. They predominantly consist of business identification signs.

> *drivers maintained a safe average vehicle headway in the presence of these signs".*
>
> [Underlining is mine.]

5.7 The key point to be drawn from Samsa's research is that digital billboards are no more distractive to drivers than any other signage type, and that when glances are made at billboards, these glance durations are below the threshold that would likely result in road safety issues.

5.8 Another Australian study by Young et al (2015) of Monash University relates to situational awareness.[12] That research was related to static image billboards in freeway situations, but is pertinent based on its following conclusions:

> *"The billboards examined were a key element of a drivers' situation awareness when driving demand was low, such as when driving on the freeway under free-flowing, low traffic conditions. However, … when driving demands increased, drivers focused less attention on the billboards.*
>
> *"These results suggest that drivers can self-regulate their attention to billboards, reducing the attention given to them when required to focus on the immediate driving situation".*
>
> [Underlining is mine.]

5.9 The key point to be taken from Young et al (2015) is that, as a driving environment or driving task becomes more complex, drivers will focus more on the driving task and less on the things that are unnecessary to the driving task (such as advertising signs).

5.10 The ability for drivers to focus on the driving task when driving demands increase was confirmed by New Zealand research undertaken by Burdett et al (2018) of Waikato University.[13] This research involved a study of mind wandering while driving, which relates directly to situational awareness. The experimental research that was undertaken confirmed that drivers focus more on the driving task at hand when in 'complex' traffic environments, with the study concluding:

> *"Drivers were more likely to report* [in the experiments] *mind wandering in low risk than in high risk situations, and in situations of low rather than high demand".*
>
> *"Situations of high demand and the highest crashes rates were places where mind wandering was least likely to be*

[12] Young K.L., Stephens A.N., Logan D.B., Lenne M.G. *"An On-Road Study of the Effect of Roadside Advertising on Driving Performance and Situation Awareness",* Proceedings of the 4th International Driver Distraction and Inattention Conference, Sydney, Australia, 2015.

[13] Bridget RD Burdett, Samuel G Charlton, Nicola J Starkey "*Mind wandering during everyday driving: An on-road study"*, Accident Analysis and Prevention, 2018.

> *reported* [in the experiments]*, suggesting an inverse relationship between mind wandering and crash risk".*

5.11 The ability for drivers to self-regulate 'secondary task' engagement at intersections was also examined by Ismaeel et al (2018) of the Institute of Transport Studies at the University of Leeds.[14] The conclusion of that study included the following:

> *"The comprehensive data analysis indicated that the drivers engaged selectively in secondary tasks in accordance with changes in the demands imposed by driving and roadway situations. The drivers exercised self-regulation by reducing their engagement with secondary activities during more demanding driving situations."*
>
> [Underlining is mine.]

5.12 As with the previous studies, Ismaeel demonstrated that, when necessary, drivers inherently self-regulate their attention away from secondary tasks (such as, perhaps, looking at advertising) in favour of focusing on driving when in demanding driving situations.

5.13 Research that is specific to digital billboards and is directly relevant to this application was undertaken by Goodsell et al (2018) of the Australian Road Research Board ("ARRB"),[15] and involved video surveys to identify before and after road safety incidents, and to evaluate before and after driver behaviours and performances, associated with the installation of new digital billboards into complex traffic signalised intersection sites. The concluding paragraph from that research is as follows:

> *"In conclusion, the current evaluation investigated the impact of the presence of digital billboards on vehicle control performance. The sites evaluated were relatively complex signalised intersections. Because of the cognitive demands associated with negotiating a signalised intersection, these are the kinds of sites where it might be expected that drivers would display impairment from distraction. However, there was almost no evidence that the digital billboards at these locations impaired driving performance. Clearly, in real world situations, the impact from the visual distraction from digital billboards is complex, and in some situations such as the installations evaluated here, there can be an apparent positive impact on driving performance from the presence of a digital billboard. If the parameters of how and when this positive impact occurs can be precisely specified, this would prove enormously valuable for all stakeholders."*
>
> [Underlining is mine.]

[14] Ismaeel R., Hibberd D., Carsten O., "*Prevalence and self-regulation of drivers' secondary task engagement at intersections: An evaluation using naturalistic driving data*", Proceedings of the 6th International Conference on Driver Distraction and Inattention (2018).

[15] Goodsell R, Dr Roberts. P "*On-Road evaluation of the driving performance impact of digital billboards at Intersections"* Project No. PRS17074 – ARRB, (2018).

5.14 The Goodsell et al (2018) research supports other similar research and demonstrates that digital billboards do not cause a reduction in driver performance that could lead to a deterioration in road safety.

5.15 Overall, it is my opinion that the body of New Zealand relevant, predominantly empirically-based research that is now emerging is increasingly confirming that digital billboards are:

a) little or no different from any other sort of advertising sign including static billboards and on-premise signs;

b) not inherently distractive to drivers to the extent that they are creating any apparent adverse road safety effects; and

c) not inherently hazardous to the traffic environment, even in complex traffic situations.

6. EXAMINATION OF ROAD SAFETY EFFECTS FROM CRASH HISTORIES

6.1 Mr Carr's evidence[16] describes the New Zealand road safety experience in relation to advertising signs by way of reference to ten years of nationwide crash data 2012-2021, wherein 73 crashes were recorded that involved the crash factor "*attention diverted by advertising or signs"*[17]*.* I note in this regard that this crash factor picks up any crash that is related to distraction by any sort of sign, not just advertising signs. These therefore include traffic signs, road works signs, directional signs, street name signs, and so on.

6.2 In undertaking my peer review, I have updated that search to include all New Zealand data from January 2012 to September 2024[18]. I have also looked further into those crashes in order to establish whether any were attributable to advertising signs including digital billboards. This was achieved by further examining the NZ Police 'Traffic Crash Report' that was associated with each individual crash, and where necessary by cross-referencing the crashes to what actually exists at the crash locations.

6.3 The 12+ year nationwide crash search revealed a total of 81 sign-related crashes. Detailed examinations of each crash reveal the following categories of signs associated with the '*attention diverted by advertising or signs*' crashes:

16 EIC Andy Carr, paragraphs 5.21–5.23
17 CAS crash factor 356
18 As at the crash search date of 9 September 2024

Category	Nature of sign	No.
Third-party advertising billboards	Digital billboard.	**0**
	Static billboard.	**4**
Commercial first-party on-premise signs	Shops / fuel price board / real estate / roadside stall.	**16**
Looking for, or at, directional signs	Street name signs / directional signs / motorway gantry signs.	**23**
Traffic signs	Traffic sign / roadworks traffic management / VMS / digital speed signs / detour sign.	**15**
Personal / community	Election hoarding / community noticeboard / place identification / protest sign.	**7**
Inappropriately coded as sign distraction	Looking for or at shops or buildings, a circus blimp, a horse statue, a navigation device, a computer, or no sign evident.	**16**
	Total	**81**

Table 1: 'Attention diverted by advertising or signs' crashes January 2012-September 2024

6.4 Table 1 shows that in the whole of New Zealand over the 12+ years of digital billboard operations, there were no crashes that involved a digital billboard, and only four crashes that involved a static third-party advertising sign. This would seem to clearly demonstrate that the presence of digital signage (and indeed third-party advertising in general), is not currently creating identifiable road safety issues.

6.5 In saying this, it is also relevant to put the number of sign-related crashes into perspective. During the 12-year search period there was an overall total of 410,800 recorded crashes in New Zealand. Even if the combined total of 20 crashes involving some sort of advertising is considered (that is, the 4 static third-party advertising signs, and the 16 first-party business identification signs), they represent only 0.005% of all crashes. The four static advertising sign crashes represent 0.001% of all crashes.

6.6 To put the 20 advertising sign-related crashes into further perspective, the CAS data reveals that a driver is:

a) 67 times more likely to have a crash due to a wheel coming off the vehicle being driven;

b) 120 times more likely to have a crash due to looking at scenery or people outside the vehicle; and

c) 570 times more likely to have a crash due to an in-vehicle distraction.

6.7 A commonly posited view in relation to the CAS crash database is that drivers might, in reporting on crashes, be unwilling to admit to, or are unaware of,

being distracted by signs in general, and digital billboards in particular. However, there is no reason why drivers who have been involved in a crash would not want to point to distraction by a billboard, any more or less than they would point to distraction by any other element of the external traffic environment, or elements internal to the vehicle.

6.8 Some of the research that I have previously referred to[19] suggests that the presence of digital billboards may assist to enhance a driver's situational awareness, that is, they may assist drivers to maintain engagement with the driving task and remain looking at the road ahead instead of being either distracted by elements within the vehicle (particularly the use of cell phones and in-car technology), or being simply inattentive due to mind wandering. To that extent, the research implies that there may be a net road safety advantage to enabling the presence of well-placed roadside digital billboards as a means of off-setting inattention or mind-wandering.

6.9 I also note in this regard that research from Queens University in Ireland found that while distraction due to objects inside the vehicle are under-reported and hence under-represented as a crash factor, no such difference was found with regard to distraction from outside the vehicle.[20] This further supports the analysis of individual crash records as providing a useful tool to understand the potential impact of advertising signs on driver attention and safety.

6.10 The absence of any recorded crashes within the CAS database that directly cite digital billboards is also supported by the broader examinations of crash histories that are often undertaken by way of post-implementation monitoring as conditions of consent for digital billboards, or specifically for the purposes of research such as undertaken and described by Mr Carr[21]. Such studies typically look beyond individual crash causes to determine whether there have been any identifiable changes to general crash patterns or crash numbers at individual digital billboard sites.

6.11 Monitoring studies that I have been involved with, and those that I am aware of that have been undertaken by others, have consistently demonstrated that even when looking beyond individual crash records to consider broader

[19] Including Young *et al* (2015), Goodsell *et al* (2018), and Cunningham *et al* (2016).

[20] Regev S, Rolison JJ, Feeney A, Moutari S "*Driver distraction is an under-reported cause of road accidents: An examination of discrepancy between police officers' views and road accident reports*", Queen's University, Belfast, presented at Fifth International Conference on Driver Distraction and Inattention, (2017).

[21] EIC Andy Carr, paragraphs 5.21 to 5.34.

road safety patterns and influences, no adverse changes have been identified that could be potentially attributed to individual digital billboard installations.

6.12 Clearly, digital billboards are not a new phenomenon – the first digital billboard was established in 2012 and, with their very significant growth (there are now 1,000+ digital signs on New Zealand) - there is now a significant database to examine, thereby providing the ability to directly observe, measure and evaluate their actual effects in operation. The short point is that despite some particularly concerted efforts by various parties to demonstrate otherwise, digital billboards are not featuring at all in the crash statistics, and the now numerous monitoring studies of their operation have revealed no evidence of any adverse change to crash numbers, patterns, or severities as a consequence of digital billboard operations.

6.13 Accordingly, I am able to concur with the ATM[22] and Mr Carr's evidence[23] that:

> *"… a review of the Waka Kotahi CAS database shows there has been no reported crash in which distraction from a consented digital billboard has been cited as a contributing factor, and from my own research, there is no location in New Zealand where the number/rate of reported crashes has increased after a digital billboard has been installed compared to the number/rate of reported crashes prior to installation."*

7. CONSISTENCY WITH TASMAN RESOURCE MANAGEMENT PLAN

7.1 The proposed billboard does not achieve all the permitted activity standards that apply to signs located within the Central Business Zone, thereby triggering the need for a restricted discretionary activity resource consent / assessment for the proposal.

7.2 The permitted activity standards that are not met include:

a) 16.1.4.1 (a) – dimensions in accordance with Figure 16.1B; and

b) 16.1.4.1 (b) – relating only to 16.1.3.1(b) which requires that all signs relate to the activities undertaken on the site.

7.3 However, all of the traffic-related permitted activity standards for the proposal are met or can be met in practice. These include:

[22] ATM paragraph 3.2.18, page 12.
[23] EIC Andy Carr, paragraph 5.32.

a) 16.1.3.1 (f) – relating to ensuring that the sign does not mimic (by way of design, shape or colour) a traffic sign. This is addressed by the volunteered conditions 15.b and 15.d as appended to Ms Collie's evidence which together will ensure that no images will mimic or conflict with any sort of traffic control device including traffic signs, and will not direct a driver to take some sort of driving action.

b) 16.1.3.1 (g) – relating to ensuring that the sign does not incorporate retro-reflective material, or flash, or contain images that include any movement. This is addressed by proposed Conditions 7 and 15.a which together will ensure that all images shown on the LED screen (which is inherently non-reflective) will be static while being displayed.

c) 16.1.3.1 (h) – relating to text size. In relation to text size, I fully concur with the assessments related to text legibility as described by Mr Carr.[24] Any text that advertisers want to be read inherently achieves the 150mm required by the standard, or else the advertisement would be of little value to the advertiser if it was not. However, it is neither necessary nor feasible for <u>all</u> text to have a minimum height of 150mm, particularly when that text is included in product labels, logos, legal disclaimers, terms and conditions, and other text that contributes to an image but for which individual legibility is neither anticipated nor necessary.

7.4 When considering a restricted discretionary sign application, Council has restricted its discretion (in terms of traffic-related matters) to location and legibility in relation to traffic safety.[25] The traffic-related aspects of the location and legibility of the proposed billboard have, in my opinion, been comprehensively addressed in the ATM and in the evidence of Mr Carr.

8. CONSISTENCY WITH TCDM3 GUIDELINE

8.1 The ATM and Mr Carr's evidence both provide an assessment of the proposal against the guidance provided by TCDM3[26]. I agree with Mr Carr's evaluation that there are only two areas of any material inconsistency with the TCDM3 guidance, being that the proposed billboard will be located within 100m of an intersection, and that there will be less than 50m separation from other signs.

[24] EIC Andy Carr, paragraphs 6.11 and 6.12
[25] Clause 16.1.4.2(1)
[26] ATM section 4 and EIC Andy Carr, section 6.

8.2 I confirm what Mr Carr has noted that, when interpreting TCDM3, it is important to understand that it is a guideline that provides recommendations, and not a standard or rule for which compliance is mandatory.

8.3 In terms of the inconsistency of the proposal with the TCDM3 recommendation for 100m separation of any sign from an intersection, it is my opinion that:

a) requiring compliance would represent a nonsense approach given that it is virtually impossible to achieve. This proposal cannot achieve the 100m separation recommendation – indeed, existing signs and billboards in urban areas in New Zealand can rarely achieve this recommendation simply because there are very few urban locations that are not within 100m of an intersection as block lengths are typically less than 200m; and

b) the TCDM3's underlying reason for the recommendation is to ensure that signs do not detract from, obscure, or conflict with any traffic control device, which will not occur with the proposed billboard in this case.

8.4 With the amended proposal, its primary traffic audience will in effect be confined to Gladstone Road eastbound road users. When viewed from this approach, there is no visual interaction with any of the traffic signal heads. Based on the research provided by Goodsell *et al* (2018) which examined the road safety implications associated with the introduction of digital billboards at complex signalised intersections, it was demonstrated that doing so neither compromised driver performances and /or driver behaviours, nor resulted in road safety incidents. Indeed, it was suggested (albeit not proved), that the introduction of the billboards may have assisted the safety of the intersection by increasing situational awareness.

8.5 In terms of the recommended 50m longitudinal separation distance between adjacent advertising signs, I concur with Mr Carr that such a recommendation makes little sense within any commercial environment given that on-premise signs are an inherent feature of such environments, as they are in this case. This is explicitly acknowledged within TCDM3 with its explanation of the 50m sign separation recommendation, wherein it states that:

> *"The spacing is based on the time taken for a road user to read and assimilate signs of the maximum recommended complexity. <u>They may not be achievable in many</u>*

> *circumstances, such as those in lower speed, urban areas (eg 60km/h or less).”*[27]
>
> (Underlining is mine)

8.6 In all other respects relating to the locational and design attributes of the billboard, I concur with Mr Carr that the proposal is consistent with the guidance provided by TCDM3. I also agree with Mr Carr that the TCDM3 operational recommendations are all addressed by way of the recommended conditions of consent.

9. COMMENT ON SUBMISSIONS

9.1 Section 11 of Mr Carr's evidence provides a detailed response to the issues raised in submissions; however, there are some further points that I would like to elaborate on in the following paragraphs.

Driver distraction

9.2 There is a common perception amongst some submitters, including the NZTA submission[28], that digital billboards are so inherently distractive to road users that they will inevitably lead to crashes. This overarching perception is encapsulated by the following statement made in the NZTA submission:

> *"Billboards are inherently designed to capture attention, which can significantly distract a driver's focus from driving, increasing the risk of crashes."*

9.3 The difficulty with this perception is that it is not supported by any probative evidence. If a road user chooses to glance at a billboard, either while waiting at the traffic signals or while passing through the intersection, that is not a distraction unless it causes such a change in either driver behaviour or driving performance that it generates a material effect that could impinge on road safety. While some driver simulation studies have measured some changes in driver responses when exposed to a billboard in an artificial, animated video driving situation (with those responses including changed lateral position within a lane or changed following distance), the magnitudes of those changes are not such that they could or do compromise road safety. In this regard, there is no evidence that I am aware of to suggest that driver behaviour / driving performance responses to advertising signs are materially different to those that might routinely be expected to occur with any other aspect of the driving environment such as scenery, people,

[27] TCDM3 Section 5.4, Page 5-4, as a footnote to Table 5.3
[28] NZTA submission dated 9 August 2024, at paragraph 12.

animals, roadside art features, buildings, construction sites, roadworks, and so on. Rather, based both on nationwide CAS crash statistics, and before-and-after road safety studies at individual digital billboard sites, the evidence is that digital billboards are not featuring as potential sources of crashes.[29] This includes at signalised intersections within busier and more complex traffic environments than exist in this case, where the research confirms that drivers are able to self-regulate their attention to focus on the driving task at hand in favour of having attention drawn to discretionary visual elements such as, in this case, an advertising sign.[30]

9.4 As Mr Carr's evidence correctly identifies, the body of evidence that is relevant to the manner in which the proposed billboard will operate, and how road users will likely respond to it within its traffic context, suggests that it can be compatibly and safely integrated into this particular traffic environment, as has already safely occurred at hundreds of similar locations throughout New Zealand.

Crash history of the intersection

9.5 A number of submitters have cited the road safety record at the intersection as being a reason for opposing the proposed billboard. In my opinion, however, when the crash patterns at the intersection are considered in detail, particularly in relation to how the proposed billboard could potentially influence or be influenced by those patterns, the conclusion reached is that this proposal will unlikely have any more impact on the road safety performance of the intersection than any other non-traffic generating activity that could be established. This conclusion is supported by:

a) there being no evidence to show that digital billboards in general impact on the road safety performance of traffic environments including intersections;[31]

b) the nature and location of crashes at the intersection being reasonably typical of what might be expected at any signalised intersection of urban arterial roads, with little to indicate any particular issue for the Gladstone Road approach from which the billboard will be visible;[32] and

c) there being no particular inherent road safety deficiencies that the proposed billboard is likely to further compromise, or that would

29 Refer to my paragraphs 6.2 to 6.6 above.
30 Refer to my paragraphs 5.7 to 5.13 above.
31 Refer to my section 6 above.
32 Refer to my paragraphs 4.6 to 4.8.

otherwise preclude the appropriately safe operation of the proposed billboard.

9.6 I address these points further in my section 10 below in my response to the TDC Traffic Review.

NZTA Submission

9.7 It appears from the NZTA submission that the key issue is the perceived risk to the safe operation of the intersection due to the introduction of the proposed billboard, particularly for the zebra crossing on the Give Way controlled left turn from Lower Queen Street into the Richmond Deviation. This issue has since been resolved by reorienting the billboard away from this left turn.

9.8 The NZTA submission also raised the issue of the originally proposed dwell time of 8-seconds (which applies to the vast majority of digital billboards in New Zealand) as being too short. This has been addressed in the amended proposal wherein a 30-second dwell time has now been proposed.

9.9 Accordingly, with the now proposed 30 second image dwell time as volunteered by the Applicant and included in the proposed conditions of consent, and the proposed reorientation of the billboard as also volunteered by the Applicant, I concur with Mr Carr's conclusions regarding the NZTA submission[33] that:

a) There is no evidence that digital billboards give rise to any adverse road safety outcomes; and

b) The manner in which the proposed billboard will be operated and controlled in this case mitigates any potential for adverse effects.

10. COMMENT ON THE TDC TRAFFIC REVIEW

10.1 Mr Carr's evidence has addressed the TDC Traffic Review[34]. I concur with the responses provided by Mr Carr, but wish to elaborate on two issues.

Intersection safety assessment

10.2 The TDC Traffic Review makes much of the comparative road safety performance of the intersection adjacent to the proposed billboard,

[33] EIC Andy Carr, section 10.
[34] EIC Andy Carr, paragraphs 10.1 to 10.8.

describing it as having "...*both the highest number of reported crashes and the highest number of reported all-injury crashes of any urban intersection across the Nelson and Tasman regions over the five-year period 2019-2023*".[35] However, this statement is not entirely correct insofar that my examination of the CAS database for the 5¾ year period 1 January 2019 to October 16, 2024 reveals that the Whakatu Drive / Annesbrook Drive intersection has a higher total with 41 crashes within 80m of the intersection, versus 34 crashes at the Richmond Deviation intersection. I note in this regard that the Whakatu Drive approaches to Annesbrook Drive have a 70km/h speed limit, but actual speeds at the intersection are appreciably slower due to the slowing effect of the roundabout control; and they are likely comparable to the speeds experienced on the Richmond Deviation approach to Queen Street / Lower Queen Street given that the Richmond Deviation traffic has emerged from a 100km/h speed environment a short distance upstream.

10.3 Notwithstanding this comparison, the statement made in the TDC Traffic Review is clearly intended to be alarmist. However, it does little to elucidate in an evidential manner:

a) which of the crashes that have been recorded at the intersection are relevant to the ability of road users to actually see the proposed billboard, because clearly the majority of crashes have occurred where there is no ability to see it;

b) which crash types are relevant in terms of potentially being further influenced by the presence of the proposed billboard, and why; and

c) how, and to what extent, will the overall number and pattern of crashes at the intersection be potentially affected by the proposed billboard.

10.4 In relation to the above points, it is relevant that the billboard will now be primarily visible to the eastbound Gladstone Road approach only. There will be no visibility from the Richmond Deviation approach, and only incidental visibilities from the Queen Street and Lower Queen Street approaches.

10.5 The only extent that the TDC Traffic Review attempts to link crash history for the wider intersection to billboard effects is through its statement that: "*A summary of the contributing crash factors across all 47 reported crashes for the ten-year period 2014 – 2023 shows that the main factor was poor observation, which was recorded in 25 crashes or just over half of all crashes.*

[35] TDC Traffic Review, Section 5, paragraph 4.

Poor observation includes both driver inattention and distraction".[36] With respect, this statement is so broad in its description of crashes, and so tenuously linked to the determination of potential road safety effects of establishing the proposed billboard that it provides no meaningful assistance at all.

10.6 In particular, the statement that over half the crashes at the intersection are due to "poor observation" is so wide and vague in its interpretation and meaning that it cannot be credibly relied upon as the basis of a technical road safety assessment. Further, whatever "poor observation" might mean in terms of driver behaviours, my experience in forensic crash analysis is it would likely be best described as encompassing mind wandering, an inability to see something that should be seen, inattention, and cognitively impaired attention. I am unaware of any source that suggests that "poor observation" could be considered as encapsulating "distraction".

10.7 I note in this regard that the CAS database has a range of specific codes that enable searches on 'distraction', and which cover virtually every type of distraction that I can think of. I have therefore undertaken a 10-year crash search at the subject intersection and have specifically queried whether any crashes have recorded some form of distraction as a possible contributing factor. There were zero.

10.8 Further, and as previously described in sections 6, 9.2 and 9.3 above, the New Zealand-wide search of crashes over 12+ years that digital signs have been operating has revealed zero crashes where distraction due to a digital billboard have been recorded as a possible contributing factor.

10.9 This means that regardless of what the existing road safety performance of the subject intersection has been in the past, there is no material evidence to suggest that it will be inherently further compromised by the proposed billboard as has been implied in the TDC Traffic Review. In this regard therefore, I certainly do not agree with the assumption made in the TDC Traffic Review (that is made without supporting probative evidence) that the proposed billboard "...*has a likelihood of adverse effects on traffic safety that will be more than minor*."

10.10 In relation to the point made in 10.3(a) above regarding the relevance of existing intersection crashes to the proposed billboard, this has been

[36] TDC Traffic Review, Section 5, paragraph 6.

addressed in Mr Carr's evidence[37] which I am in agreement with. I also note that:

a) the analysis of crashes throughout New Zealand that I have described previously in section 6 of my evidence, and the research that I have cited, provides no indication at all of billboards affecting crash rates or crash patterns;

b) the before-and-after studies at individual digital billboard sites, including the in-depth studies as described by Mr Carr[38], clearly demonstrate that the introduction of digital billboards at signalised intersections does not identifiably change either crash numbers or crash types at those intersections;

c) Mr Carr describes[39] that there is nothing extraordinary in the crash statistics for the Gladstone Road approach to the billboard that suggests anything other than a minor number of existing crashes on this approach. I have checked this from the CAS database for the 5¾ year period 1 January 2019 to 16 October 2024, and have found only three crashes (one minor injury and two non-injury) where the at-fault driver was travelling eastbound on Gladstone Road within 100m of the billboard. Of these, one involved a rear-end incident, and two involved a failure to give way to a red signal. These are low crash numbers that do not indicate to me an inherent road safety issue that is of particular concern in relation to the proposed billboard.

10.11 Clearly therefore, the reliance of the TDC Traffic Review primarily, indeed almost solely, on the inaccurate and very broad observation that the subject intersection has the worst road safety performance in the region provides little to assist in assessing the actual likely road safety implications of the proposal. This particularly applies given that the NZTA MegaMaps tool as I have previously described in paragraph 4.9 does not show the intersection or its approaches as being particularly problematic. In my opinion, the more comprehensive and detailed analysis provided by Mr Carr in his evidence enables a more accurate determination of whether or not the proposed billboard can be safely and compatibly integrated into its traffic environment. In this regard I therefore concur with the assessments and conclusions as provided by Mr Carr in his evidence.

37 EIC Andy Carr, paragraphs 10.3 to 10.4.
38 EIC Andy Carr, paragraphs 5.21 to 5.29.
39 EIC Andy Carr, paragraphs 4.13 to 4.19.

The Austroads Research Report AP-R420-13

10.12 Both Mr Carr and Mr Fon have made references in their respective reporting to the Austroads Research Report AP-R420-13 "*Impact of Roadside Advertising on Road Safety*" ("Austroads Report"); and both have taken different extracts from that report in support of their assessments. This has resulted in different interpretations being drawn from the same document. Accordingly, some further discussion of that report may be helpful to give it some context.

10.13 The Austroads Report was published in 2013. I am not certain whether Australia had any operational billboards in 2013, but if there were, there would have been a handful at most. The intent of the report was to bring together what little international knowledge was available at that time to assist Australian roading authorities to assess and evaluate the impending emergence of digital billboards, in much the same way that New Zealand's TCDM3 did (which coincidentally was also published in 2013).

10.14 Because international operational experience of digital billboards was still sparse at that time, and because of the pervading perception that digital billboards simply must be inherently and hazardously distractive, the Austroads Report was necessarily very conservative in its approach. Having said that, the Austroads Report was in its time an excellent report that served Australia well in the early stages of digital billboard developments.

10.15 However, since its publication, the theory-based research into the potential road safety effects that the Austroads Report was predominantly based on have been largely eclipsed by the operational experience of digital billboards as now available. By way of illustration of this point, I note that the lead author of the Austroads Report was a researcher by the name of Paul Roberts. Mr Roberts has subsequently published a number of other studies related to digital signage, including co-authoring one of the 2018 Australian Road Research Board papers that I referred to in paragraphs 5.13 and 5.14 above. With the benefit of direct examination of the actual driver behaviour and road safety implications of real-world digital billboards located at signalised intersections, the conclusion reached in the 2018 ARRB paper that he co-authored was that:

> *"... there was almost no evidence that the digital billboards at these locations impaired driving performance. Clearly, in real world situations, the impact from the visual distraction from digital billboards is complex, and in some situations such as the installations evaluated here, there can be an apparent positive impact on driving performance from the presence of a digital billboard."*

10.16 The point to be made from the Austroads Report that both Mr Carr and Mr Fon refer to is that it provides useful background to the evolution of assessment of digital billboards, but it would probably be unwise to place too much weight on individual sentences from that report that may not necessarily reflect its overarching intent; and which in respect of the research and operational experience advances that have been made since, should be placed in a wider context as Mr Carr has appropriately done in his evidence.

11. PROPOSED CONDITIONS

11.1 I have reviewed the traffic conditions as volunteered by the Applicant as appended to Ms Collie's letter of 7 October 2024 (which advises TDC of proposed amendments to the application).

11.2 I am satisfied that the conditions will fully and appropriately address all the potential traffic operations and road safety implications of the proposal.

11.3 In relation to dwell time, when I originally considered this proposal, the intent was that it would operate with a dwell time of 8-seconds. Based on my 13 years of assessing and reviewing digital billboards in almost every sort of traffic environment, the vast majority of which operate with an 8-second dwell time, I was quite comfortable with the 8-seconds as proposed. I understand however, that discussions held with NZTA have resulted in a now preferred dwell time of 30-seconds. In my opinion, the 30-second dwell time as now volunteered by the Applicant will result in a highly conservative dwell time for this traffic environment that will provide a 'belt-and-braces' level of comfort to the road safety acceptability of the proposal, (as has been confirmed by the analyses provided by Mr Carr in his evidence).[40]

[40] EIC Mr Carr, section 9

12. CONCLUSIONS

12.1 Based on my examination of the available relevant research, it is my opinion that the proposed digital billboard, operated in accordance with the conditions of consent proposed by the Applicant, can be established without creating any hazardous driver distraction. While some drivers may choose to glance at the billboard, the research indicates that those glances will not be of a duration that would create any identifiable adverse road safety effects.

12.2 An examination of the New Zealand crash database for all crashes in New Zealand that have occurred during the past 12+ years that digital advertising screens have been operating in New Zealand reveals no recorded crashes associated with the presence or operation of any digital billboard. This empirically based outcome confirms the research that digital billboards are not inherently detrimental to road safety.

12.3 While concerns have been expressed regarding the compatibility of the proposed billboard within this particular traffic environment, these concerns are not, in my opinion, credibly based. Rather, they are predominantly based on perceptions regarding the distractive effects of digital billboards that are unsupported by:

a) what is able to be directly observed and monitored in the real-world operations of digital billboards in New Zealand;

b) examination of country-wide and individual-site crash histories; and

c) reference to relevant international research.

12.4 In my opinion, there is nothing that is so unique about the location of the proposed billboard that it would preclude the application of the research and assessments that have been described in Mr Carr's evidence and in my evidence. Rather, it is my opinion that the proposed billboard would be unlikely to result in any material compromise to the welfare or safety of any road user. Confidence in this conclusion can be gained from the knowledge that there is no baseline of recorded crashes due to digital billboards in New Zealand, and with the design and operational attributes that are proposed, there is no credible basis to suggest that there is anything about this particular proposal that will cause it to generate crashes when no other digital billboard in New Zealand ever has.

12.5 From my review of Mr Carr's statement of evidence, I can confirm that the descriptions and assessments he has provided have been properly conducted, and that all the necessary matters required to provide an informed opinion on the proposal have been fully addressed. Having undertaken my own assessments to verify his analyses, I am able to confirm my opinion that there are no traffic engineering or road safety reasons that would preclude the establishment of the amended digital billboard proposal as presented.

Brett Harries

17 October 2024