

PROPOSED CONSENT VARIATION DIGITAL BILLBOARD DWELL TIME

440 MT WELLINGTON HIGHWAY MT WELLINGTON



TRAFFIC ENGINEERING REPORT

Prepared For Jaafar Holdings Limited

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1 Introduction

This report provides a traffic engineering and road safety assessment of a proposal by Jaafar Holdings Limited (“Applicant”) to vary a condition of consent which relates to the image dwell time that applies to the existing north-facing screen of a double-sided V-oriented digital billboard pair that is located near to the northwestern corner of the site at 440 Mount Wellington Highway in Mount Wellington (“Site”). The north-facing billboard faces southbound traffic on Mount Wellington Highway (“MWH”). The proposed variation seeks to modify the minimum 30-second dwell time that currently applies to the billboard, to a reduced minimum dwell time of 8-seconds, (“Proposed Variation”).

The subject billboard is one of four digital billboard screens (arranged as two V-oriented double-side billboard pairs) that are currently located on the MWH frontage to a site at 430-440 Mt Wellington Highway. Land use consent to enable the construction and operation of the four billboards was granted in August 2019 (LUC60326896), and they became operational on 22 December 2021.

Condition 10 of LUC60326896 specified the dwell time to apply to all four billboard screens as follows:

Dwell time - the display time for each image - shall be a minimum of thirty (30) seconds and the image has to change at the same time for all proposed LED billboards or as otherwise required by monitoring the effects of this display time under condition 16.

After the billboards had been operating for about 17-months, an application was made to change Condition 10 to enable the minimum dwell times for the four billboard screens to be reduced to 8-seconds. The application was accompanied by a Harries Transportation Engineers report “*Digital Billboard Dwell Times – 430-440 Mt Wellington Highway, Mt Wellington - Traffic Engineering Report*” (May 2023).

Section 92 requests for further information arose from the application, and those relating to traffic matters were responded to in a Harries Transportation Engineers memorandum “*LUC60326896-A: Jaafar Holdings Limited, Digital Billboard Dwell Times - 440 Mt Wellington Highway, Mt Wellington, Response to S.92 Request for Further Information – Traffic Engineering*” (4 July 2023).

As a consequence of road safety concerns expressed by Auckland Council (“Council”) and Auckland Transport (“AT”) traffic representatives in relation to the implications of the proposed reduced dwell time on the northern north-facing billboard (“Billboard”), it was agreed that its proposed dwell time reduction would be withdrawn from the Application to enable further investigations and assessments to be pursued.

Subsequently, the application to change Condition 10 to enable a reduction in the minimum dwell time from 30-seconds to 8-seconds was granted by way of decision LUC60326896-A in October 2023, but only insofar that it applied to three of the four billboards being the south-facing billboard on the northern billboard pair, and both of the southern billboard pair, i.e. the consent did not include the subject Billboard.

Following the issue of LUC60326896-A, further discussions with Council and AT traffic representatives were held specifically in relation to the Billboard, and further investigations and assessments were undertaken in an attempt to address the concerns held. These

further assessments were described in two Harries Transportation Engineers memoranda, being:

- a) *“Jaafar Holdings Limited, 440 Mt Wellington Highway, Mt Wellington, Existing Digital Billboard Dwell Time Assessment”* (17 July 2024).
- b) *“PRR00041653: Jaafar Holdings Limited, Digital Billboard Dwell Times - 440 Mt Wellington Highway, Mt Wellington”* (8 August 2024).

Despite the additional assessments, at a Pre-Application Consenting meeting held on 8 May 2024, Council and AT traffic representatives indicated non-support for the reduced dwell time proposal for the Billboard, with this position being articulated in the meeting minutes *‘Pre-Application Consenting Memo (Pre-Application No. PRR00041653’* dated 31 January 2025 (“Pre-app Memo”).

Notwithstanding this non-support, it is considered that the Proposed Variation does have technical merit. In this regard it is considered that the primary road safety concerns expressed by the Council and AT traffic representatives are either over-stated, and /or cannot be supported by probative evidence. Accordingly, the Applicant wishes to pursue the Proposed Variation.

It is relevant to confirm at the outset that the Proposed Variation seeks only to modify a single aspect of operation of the existing Billboard, being Condition 10 that relates to dwell time. All other operations related to the Billboard, and all of its physical attributes including location, orientation, size, and relationship to the nearby intersection remain as per LUC60326896-A. Accordingly, this report is primarily focussed on dwell time. Having said that, other aspects such as the Billboard’s physical relationship to its traffic environment are considered in as much as the Billboard’s dwell time may influence or be influenced by those broader considerations.

In order to fully describe the traffic engineering and road safety aspects of the Proposed Variation, this report brings together, where relevant, all the assessments that have been undertaken to date, including responses to the specific matters raised by the Council and AT traffic representatives in the Pre-Application Consenting Memo.

The structure of this report is therefore as follows:

- a) Section 2 provides a brief description of the existing traffic environment, and includes information on the measured approach travel speeds to the Billboard.
- b) Section 3 provides an assessment of the approach visibility to the Billboard, with a particular focus on its existing relationship with the traffic signals that operate at the nearby upstream intersection.
- c) Section 4 provides an assessment of the crashes that have occurred on MWH upstream of the Billboard since commencement of its operation, with a particular focus on any crashes that are likely to have been either the result of the Billboard, or which provide evidence of having been contributed to by the Billboard. The analyses of crash information also include comparisons of crash patterns that occurred prior to the implementation of the Billboard against those that have occurred since, with a view to establishing whether there has been any material change that is potentially indicative of an adverse road safety influence by the current operation of the Billboard.

- d) Section 5 provides an assessment of the overall road safety implications of digital billboard operations in New Zealand.
- e) Section 6 addresses the primary issue of dwell time, and includes descriptions of the research that applies to digital billboard dwell times, with a particular focus on research that is relevant to the manner in which digital billboards operate in New Zealand (Section 6.1); an assessment of current industry practice in New Zealand in relation to dwell times (Section 6.2); the dwell time that is proposed in this case (Section 6.3); and an assessment of the extent that the proposed 8-second dwell time will be in accordance with Auckland Unitary Plan – Operative in Part (“AUP”) standards, and the guidance provided by the New Zealand Transport Agency Waka Kotahi (“NZTA”) ‘*Traffic control devices manual, 2011, Part 3 Advertising signs*’ (“TCDM3”) (Section 6.4).
- f) Section 7 provides responses to the particular matters of concern raised by the Council and AT traffic representatives.
- g) Section 8 provides a summary and conclusions of traffic engineering and road safety findings with regards this proposed variation.

These and other relevant matters are discussed in the detail of this report to follow. By way of a summary of the assessments and analyses that will be described, it is concluded that the Proposed Variation can be accepted as having a less than minor potential to adversely impact on the function and safety of the local traffic environment.

2 The site

2.1.1 Billboard location

The Billboard site has frontages to MWH to the west, the Mt Wellington Interchange northbound off-ramp from the Southern Motorway to the north, and the Eastern Line railway line to the southeast.

Figure 1 shows the location of the site, with the position of the Billboard augmented in red. (It is noted that the red line has been placed on the top of the screen as it appears in the aerial photograph, which may vary slightly from reality due to parallax effects associated with the position from which the aerial photograph was taken). The Billboard is located in the north-western portion of the site to be visible to southbound traffic on MWH.

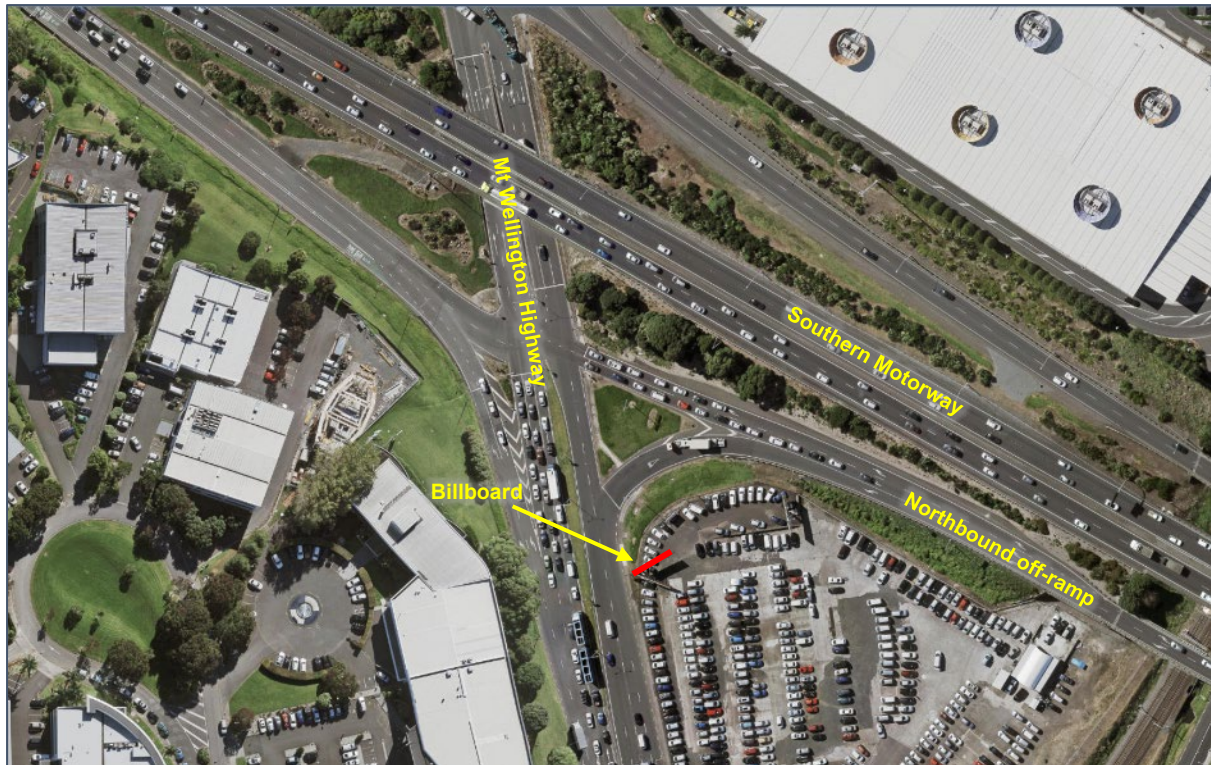


Figure 1: Billboard location

The Billboard will not be practicably visible to traffic approaching MWH from the off-ramp, although it may be incidentally visible to road users who are stationary at the off-ramp left turn lane prior to proceeding southbound on MWH.

The Billboard is also incidentally and briefly visible to the southbound direction on the Southern Motorway, although during the normal course of driving it is not noticed by drivers for the reasons that it sits outside a driver's normal field of vision; the necessarily long viewing distances are such that the Billboard appears indistinct and certainly does not enable any legibility of screen content; and when viewed from a standard vehicle the view of the billboard is significantly interrupted by the rear of the sign mounted on the overbridge which is directed toward MWH northbound traffic. For all these reasons, unless a driver has prior awareness of, and is deliberately looking for the Billboard, it sits too far to the right of where a driver would normally be focused on traffic ahead while driving, and sufficiently far into the distance, to not even be noticed by that driver even in peripheral vision.

There is no practical visibility of the Billboard from the northbound direction on the Southern Motorway, as roadside trees and bushes fully conceal its presence.

2.1.2 Southbound traffic speeds

As part of the consultation process, AT requested that a southbound speed count be undertaken in the section of MWH between the off-ramp intersection and the off-ramp left-turn lane slip lane. AT's intention of recording at this position was to enable the measurement of essentially free-flow speeds on the downstream side of the off-ramp intersection, i.e. so that the recorded speeds are not materially influenced by upstream queuing effects or the overall slowing that typically occurs when approaching an intersection, especially if not faced with a green signal. This means that the speed measurements undertaken are either of vehicles moving through the intersection on a green signal, or are

accelerating away from the intersection having received a green signal. It would be expected that these more free-flowing speeds would be greater than would be expected on approach to, (i.e. upstream of), the off-ramp intersection, and/or traffic that is slowing to turn right onto the city-bound on-ramp. They are, however, indicative of the southbound speed of vehicles as they pass through the off-ramp intersection.

TEAM Traffic were commissioned to undertake the week-long southbound traffic speed count using a pole-mounted radar recorder. This was undertaken in the week 22-28 February 2024. Figure 2 shows the count location in relation to the position of the Billboard.



Figure 2: Speed count location.

The count measured a 7-day average daily traffic flow of 11,572 vehicles per day (“vpd”); and a weekday average daily flow of 12,781 vpd. Figure 3 below shows the hourly traffic flow profiles through each day of the week.

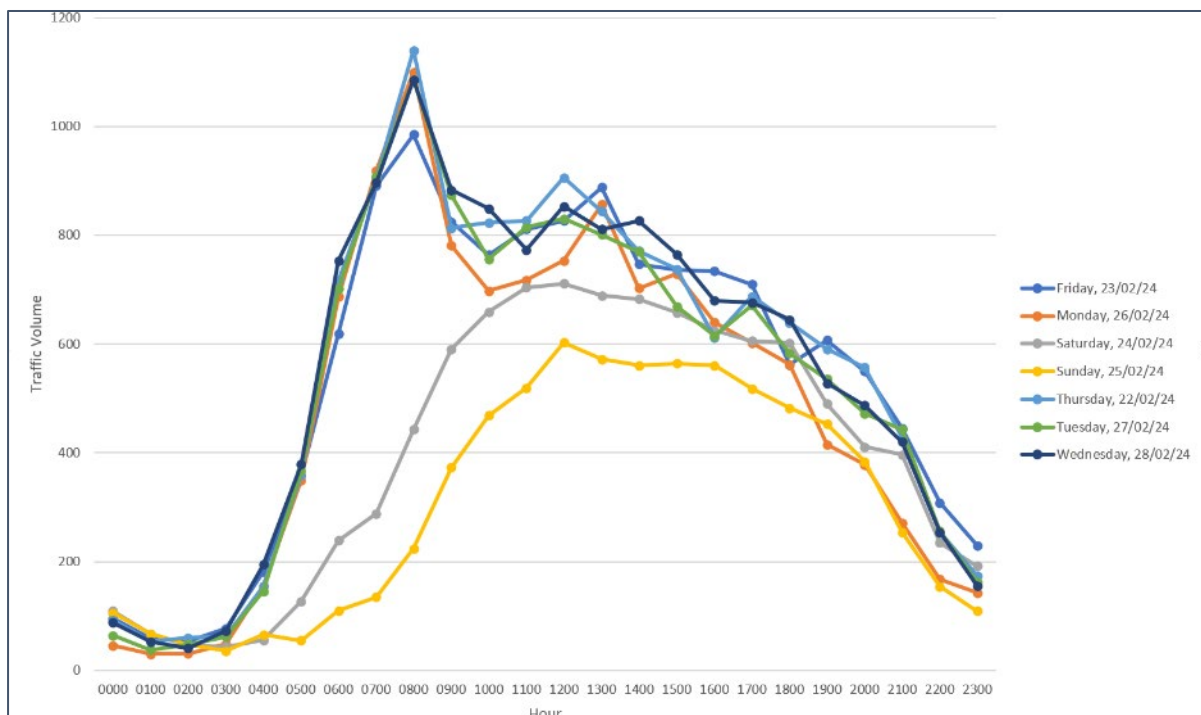


Figure 3: Southbound hourly traffic flow profiles by day (Source: TEAM Traffic)

In terms of travel speeds, the data revealed:

- a) A 7-day mean speed of 47.6 km/h.
- b) A 7-day 85th percentile speed of 54.0 km/h.

Even notwithstanding that speeds in advance of the intersection are likely to be lower than recorded downstream of the intersection, the 85th percentile speed of 54 km/h as recorded would be considered typical of an arterial road traffic environment, and certainly not unexpected or unreasonably high.

A closer examination of the temporal profile of measured hourly 85th percentile speeds throughout an average weekday and an average weekend day is illustrated in Figure 4.

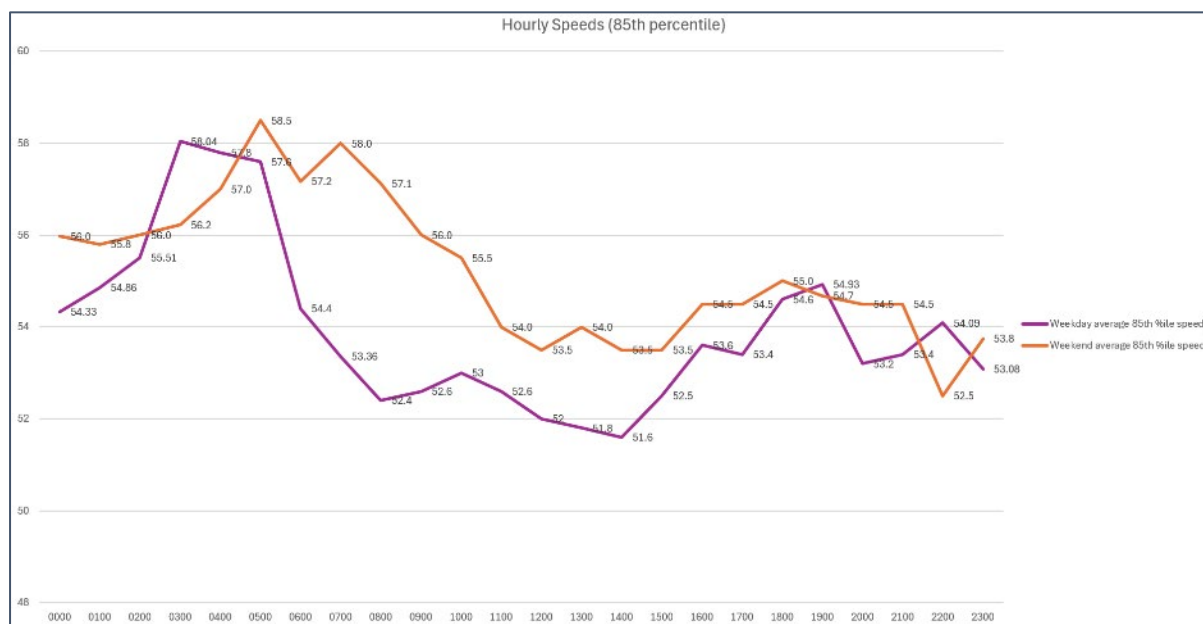


Figure 4: Hourly 85th percentile speeds by average weekday and average weekend day.

The above graph demonstrates that on weekdays, hourly 85th percentile speeds are highest between about 2am and 7am, reaching a peak of 58 km/h in the hour ending 5am. However, during the day, i.e. between 6am and midnight, the 85th percentile speeds remain consistently between 52km/h and 55 km/h, being about 53km/h on average during this period.

During the weekend, the higher early morning 85th percentile speeds persist longer, remaining above 55 km/h between midnight and 10am. However, between 10am and midnight, the hourly 85th percentile speeds remain below 55km/h, being about 54km/h on average during this period.

3 Southbound Visibility of Billboard

3.1 The intersection layout

The MWH southbound approach to the billboard is characterised by its two closely spaced signalised intersections that occur at the SH1 ramp intersections with MWH. The two intersections are coordinated, so that in the main, when road users have travelled through the northern of the two intersections, they are met with a green signal as they approach the

second (southern) intersection so that they can proceed through on a green wave, (although this does not necessarily always apply to the right turn signal).

When on the southbound approach to the second signalised intersection (i.e. that is just north of the Billboard at the intersection of the SH1 north-facing ramp connections with MWH), MWH is characterised by its three lanes that accommodate an exclusive through lane (Lane 1), a shared through and right lane (Lane 2), and an exclusive right turn lane (Lane 3).

There are four signal heads that are directed toward this southbound approach, with one at each corner of the intersection as shown in Figure 5 below.

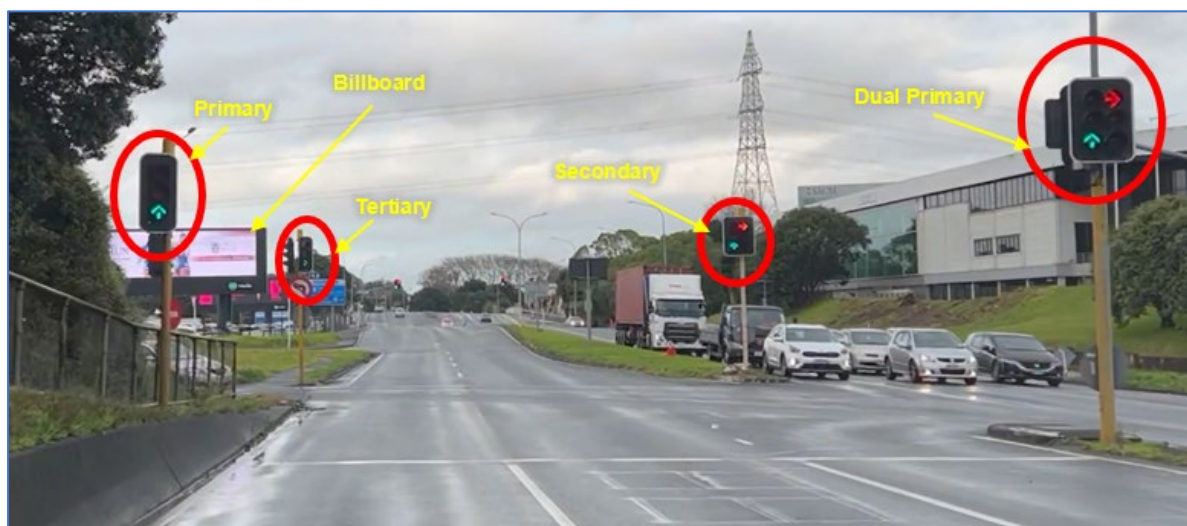


Figure 5: Southbound traffic signal faces

The primary traffic signal face (which is the traffic signal near to the near-left corner of the off-ramp intersection), consists of a single column, three aspect signal head with full discs for the red and amber displays, and a straight through arrow for the green display. This signal face sits about 88m in advance of the Billboard.

This primary signal face is supported by three other signal faces being a tertiary (with the same format as the primary); and a secondary and dual primary (each with six aspect signal faces).

The dual primary and secondary signal faces have one column that controls straight through movements, with the other controlling right turn movements. The secondary and dual primary are the only signals that control right-turn movements onto the city-bound on-ramp.

3.2 Advance visibility

The Billboard achieves initial visibility of its western edge, and full visibility of the entire screen, from each lane in the southbound approach as summarised in Table 1 below:

Advance Visibility	Lane 1 (through)	Lane 2 (through & right)	Lane 3 (right)
Initial (partial) visibility	137m	168m	213m
Full visibility	103m	116m	141m

Table 1: Initial and full visibility distances from each southbound approach lane

For all three approach lanes, further visibility is restricted in each case by trees located within the road reserve at the northeastern corner of the northbound off-ramp intersection with MWH.

3.3 Relationship between the Primary Signal and the Billboard

3.3.1 Overview

In the consultation discussions, Council and AT traffic representatives expressed concerns regarding the relationship between the primary traffic signal (as identified previously in Figure 5), and the Billboard some 88m behind it, over those sections of the southbound approach where the two visually overlap from a driver's perspective.

Notwithstanding that this is an existing situation that is not changed by the Proposed Variation, the concern expressed by the Council and AT traffic representatives was that this arrangement is not ideal from a road safety perspective, and reducing the dwell time on the Billboard will exacerbate any potential adverse road safety effects that might be inherent in such an arrangement.

The merits or otherwise of this concern are discussed in the following sections of this report

3.3.2 Extent of visual overlapping

Figure 6 below shows a plan-view projection from the north-facing billboard screen through the primary signal to the southbound approach to the intersection. The extents of the three approach lanes that fall within the projection 'shadow' is indicated by the yellow shaded area of the diagram.



Figure 6: Projection from billboard through the primary signal to the southbound approach

3.3.3 Visual overlapping from Lane 1

Figure 7 below is in effect an extract from Figure 6 that shows the plan view projection from the billboard through the primary signal to Lane 1 only. As with the previous diagram, the projection shadow into Lane 1 is indicated by the yellow shaded area.

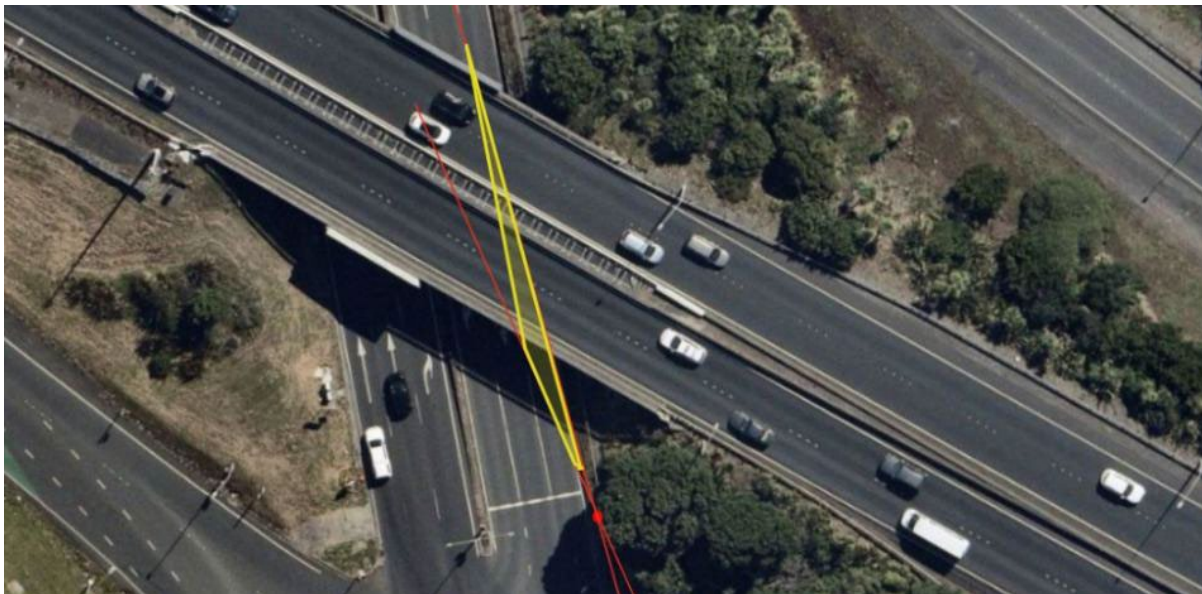


Figure 7: Projection from billboard through the primary signal into Lane 1

It can be seen from Figure 7 that the extent that Lane 1 is subject to visual overlapping is a small component of the total overlap area. When measured from a driver's position within the lane, it commences at about 40.5m from the limit line, (about 130m from the billboard) and terminates about 12.5m from the limit line, (about 102m from the billboard) thereby covering a distance of approximately 28m.

Figure 8, Figure 9 and Figure 10 to follow show windscreen cam views¹ from positions where (in plan-view), the visual overlap area commences, midway through the visual overlap area, and where the visual overlap area terminates, respectively.



Figure 8: Lane 1 commencement of plan view visual overlap (~40.5m from limit line)



Figure 9: Lane 1 middle point of plan view visual overlap (~26.5m from limit line)

¹ The windscreen cam was located to the immediate left of a driver's head position at eye level (i.e. approximately 1.1m above ground level)



Figure 10: Lane 1 termination of plan view visual overlap (~12.5m from limit line)

What the above diagrams show is that when consideration is given to:

- a) the vertical relationship between the primary traffic signal and the billboard;
- b) when the overlap occurs with either the red or amber lantern; and
- c) a driver's normal lateral position within the traffic lane,

then the actual extent of visual overlapping in Lane 1 is much less than suggested by the plan-view analysis alone.

The actual visual overlap area extends over a comparatively short distance of about 17.5m between approximately 40.5m and 23m from the limit line. It is noted that when travelling at 50km/h, 17.5m is traversed in 1.3 seconds, which demonstrates that the extent of visual overlapping is fleeting, and unlikely to be of any practical significance to the actions a driver would take.

Figure 8 above also serves to demonstrate that even when overlapping occurs, the traffic signal remains visually prominent over the billboard screen that sits a further 88m in the background. The black target board that frames the signal lanterns obviously assists significantly in this regard. Further, when the overlap occurs, the full width of the billboard cannot be viewed, so it would be less likely to be of interest to a viewer until they can see the whole screen.

It is also relevant for this Lane 1 approach, (which of the three lanes is the one most dependent on the primary signal face), that by the time that a driver is within the visual overlap area, that driver is already committed to either proceeding through the intersection or to stopping at the limit line.

In this regard, the last point at which drivers have the ability to react and respond to a traffic signal change is the 'Approach Sight Distance' ("ASD") as defined by Austroads. The ASD consists of a perception-reaction time, and a vehicle stopping time from the operating approach speed.

The Austroads formula for ASD is as follows:

$$ASD = \frac{R_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where

- ASD = approach sight distance (m)
- R_T = reaction time (sec), refer to *AGRD Part 3* (Austroads 2016b) for guidance on values
- V = operating (85th percentile) speed (km/h)
- d = coefficient of deceleration, refer to Table 3.3 and *AGRD Part 3* for values
- a = a longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

In order to calculate the ASD from this formula, the following inputs are assumed:

- a) a 50 km/h operating speed²;
- b) a flat gradient;
- c) a coefficient of deceleration of 0.36g,³ and
- d) a reaction time of 1.5 seconds⁴.

Application of these inputs results in a calculated ASD of 48m.

This means that the start of the area where visual overlapping between the billboard and a traffic signal commences (i.e. at about 40.5m from the limit line), drivers are already beyond the 48m ASD point. In other words, once drivers are within the visual overlap area, they have necessarily already committed to either stopping or proceeding through the intersection, which means that whatever is displayed on the traffic signals when within the visual overlap area is immaterial to the actions those drivers are already committed to.

Taking into consideration all the above points, it can be concluded that the brief extent of visual overlapping between the primary signal face and the billboard behind when viewed from southbound Lane 1 is very unlikely to be compromising the operation or safety of the intersection, and is equally unlikely to be influenced by the change in dwell time from 30-seconds as existing to 8-seconds as proposed. To put all of this together, an image change occurs over 0.5 seconds, and the overlap occurs for a maximum temporal window of 1.3 seconds, such that only one driver could ever be in the right position to potentially observe the change of the image at the same time that the signal is viewed in front of the partially obscured billboard, at a position where the driver is already committed to moving or stopping.

² Given the southbound operating speed of 54km/h as measured downstream from the intersection where vehicles are either proceeding through on a green or accelerating away from the intersection; the operating speed upstream of the intersection, where vehicles are either proceeding through on a green or slowing on approach to the intersection, will inevitably be less. The conservative assumption is therefore made that the approach speeds toward the intersection will be 50km/h

³ Refer Table 3.1 on Page 17 from Austroads 2021 "Guide to Road Design Part 4A; Unsignalised and Signalised Intersections."

⁴ *ibid* Austroads 2021

3.3.4 Visual overlapping from Lane 2

While the primary signal face is relevant to road users in Lane 2, the more prominent views of the secondary and dual primary signal faces (refer Figure 5) make it less imperative than it is for road users in Lane 1.

Figure 11 below shows the plan view projections from the billboard through the primary signal to Lane 2.



Figure 11: Projection from billboard through the primary signal into Lane 2

When measured from a driver's position within the lane, the projection area commences about 78m from the limit line, (about 168m from the billboard), and terminates about 28.5m from the limit line, (about 119m from the billboard) thereby covering a distance of approximately 49.5m.

Figure 12, Figure 13 and Figure 14 to follow show windscreen-cam views from positions where the plan view visual overlap area commences, midway through the visual overlap area, and where the visual overlap area terminates, respectively.



Figure 12: Lane 2 commencement of plan view visual overlap (~78m from limit line)



Figure 13: Lane 2 middle point of plan view visual overlap (~53m from limit line)



Figure 14: Lane 2 termination of plan view visual overlap (~28.5m from limit line)

At the commencement of the visual overlapping, only a corner of the billboard is visible. At this distance, the billboard is about 168m distant. The prominence of the apparently closely spaced dual primary and secondary signals (each of which has six aspects arranged in two columns) clearly dominates in terms of conspicuity of the full traffic signal set that faces southbound road users.

As a driver gets closer to the intersection, parallax effects mean that the primary signal face 'moves' reasonably rapidly from right to left across the face of the billboard screen. As particularly apparent in Figure 13 and Figure 14, the closer a driver gets, the more prominent the primary signal becomes, particularly given the effect of the target board that frames the lanterns and the inherently large distance that the billboard sits in the background. All the while during the approach, the secondary and dual primary also remain clearly in view, with all signal faces in the north-facing signal set sitting within a driver's normal forward cone of vision. This latter aspect is particularly relevant to any southbound drivers that are intending to turn right onto the city-bound on-ramp, because they will unlikely be viewing the primary lantern to their left at all, and will instead be focussed on the lanterns on their right (i.e. the dual primary and the secondary) because their intended direction of turn is to the right.

For about the first half of travel through the visual overlap area, a driver will be viewing from beyond the ASD, and in that regard will still be within the 'dilemma zone' (which is essentially the area encapsulated by Figure 13 and Figure 14). However, what these two views demonstrate is that the primary signal still remains clearly visible; and it remains fully supported by the other three sets of traffic signals that remain prominently in forward vision.

Once beyond the point that is generally depicted by Figure 13, road users are already committed to either proceeding through the intersection or stopping, regardless of any subsequent traffic signal change.

It is noted that if travelling at 50km/h, the approximately 49.5m of visual overlapping is traversed in 3.6 seconds. This means that even with a dwell time of 8 seconds, less than half the drivers who pass through the visual overlap area will see an image change.

3.3.5 Visual overlapping from Lane 3

Road users in the Lane 3 approach (i.e. the right-turn-only lane), will likely have no need to be looking at, and will likely be oblivious to the primary signal. This is because that signal face does not inform the right turn (as the dual primary and secondary do). It also requires the driver to be looking in a different direction to the intended direction of travel, and it requires looking over two adjacent lanes of traffic.

Notwithstanding these realities, Figure 15 below shows the plan view projections from the billboard through the primary signal to Lane 3.



Figure 15: Projection from billboard through the primary signal into Lane 3

When measured from a driver's position within the lane, the projection area commences about 113m from the limit line, (about 202m from the billboard) and terminates about 37m from the limit line, (about 127m from the billboard) thereby covering a distance of approximately 76m.

Figure 16, Figure 17 and Figure 18 to follow show windscreen-cam views from positions where the visual overlap area commences, midway through the visual overlap area, and where the visual overlap area terminates, respectively.



Figure 16: Lane 3 commencement of plan view visual overlap (~113m from limit line)



Figure 17: Lane 3 middle point of plan view visual overlap (~75m from limit line)



Figure 18: Lane 3 termination of plan view visual overlap (~37m from limit line)

At the commencement of the visual overlapping, only a small corner of the billboard is visible, with the majority of the signal head sitting below the billboard screen. At this distance, the billboard is about 205m distant.

As a driver gets closer to the intersection, the primary signal face appears to move from right to left across the bottom face of the billboard screen. Figure 17 shows that from a position about midway along the visual overlap extent, the primary is at the point where the red and amber lanterns are overlapping with the billboard screen behind. But once at this point, and as is obvious from Figure 17, the primary signal sits appreciably to the left of forward vision, whereas the secondary and dual primary sit directly ahead in central vision.

This is even further accentuated at the end of the visual overlap extent as demonstrated in Figure 18. By this stage the secondary and dual primary are clearly and prominently in forward vision.

Further, given that Lane 3 provides for right turning road users only, it is reasonable to expect that drivers will inherently be more fixated on the secondary and dual primary signals which are the only signals to control that turn, and which sit squarely ahead in central vision. It would not be realistic to expect that these road users intending to turn right are tempted to

look away from the right turn, to look at either the billboard and/or the primary signal which sits well to the left.

3.3.6 Summary of visual overlapping

The key points to note from the above analyses of visual overlapping between the primary signal and the Billboard a further 88m beyond are as follows:

- a) The relevance of the standard primary signal is greatest to southbound road users in Lane 1, as it sits closely proximate to that lane, and because Lane 1 accommodates only through traffic movements which is the only movement that the primary signal controls.
- b) The visual overlapping that occurs in Lane 1 is considerably less than is suggested by a plan-view analysis alone due to the vertical relationship between the primary and the billboard when viewed from within the visual overlap area. Where visual overlapping does occur, it all sits within the ASD, which means that once drivers are within the Lane 1 visual overlap area, they are already committed to either stopping at the intersection or proceeding through, regardless of any changes from green to amber that might occur on the primary. This applies regardless of what dwell time the Billboard is operating at. In other words, the proposed reduction in dwell time on the billboard will have no material impact on Lane 1 motorists.
- c) The relevance of the primary to Lane 2 traffic is reduced by virtue of the fact that the more closely spaced 6-aspect secondary and dual primary signals are positioned closer to a driver's viewing position than the primary; and because Lane 2 accommodates right-turners in addition to through vehicles, whereas the primary does not control right turners.
- d) The visual overlapping in Lane 2 occurs over a greater distance of about 49.5m, although the latter half of that overlap area occurs beyond the ASD point. Throughout all of the overlap area, parallax effects mean that the primary signal face 'moves' reasonably rapidly across the face of the billboard (noticeably 'faster' than occurs in Lane 1). Throughout the period of visual overlapping, the apparent movement of the primary, and the black target board that frames the lanterns, together ensure that the primary signal face remains prominent and clearly visible, even if focussing attention on the billboard. Notwithstanding that the primary remains clearly visible and prominent throughout the overlap period, it is also supplemented by the secondary and dual primary signals that sit closer to central vision (by virtue of the driving position in Lane 2); and by the dominance of the secondary and dual primary pair by virtue of the facts that they appear closely aligned to each and that together they provide four displays at any one time compared to the single lantern displayed by the primary. As previously noted, with an 8-second dwell time as proposed, less than half the vehicles that pass through the visual overlap area in Lane 2 will see an image change. Taking all the above points into account, it is considered that the proposed dwell time reduction to 8-seconds will also have no material impact on Lane 2 motorists.
- e) The visual overlapping from Lane 3 occurs over the greatest distance of about 76m, but also occurs farthest from both the billboard and the primary signal. Based on the assessments provided, it is considered that the visual overlapping

that occurs from this lane has either a negligible or nil potential to impact on the right-turning drivers that occupy Lane 3. This occurs because when turning right, drivers are focused on the secondary and dual primary signals which are the only signals that control the right turn; and because the secondary and dual primary signals sit squarely ahead in central vision. It is simply too uncomfortable, and in practice too difficult, to be aware of the controls that apply to the right turn and to prepare for that right turn, while also looking to the left away from the controls and the alignment relating to the intended right turn. In these regards, the proposed reduction in dwell time on the billboard will likely have no impact on Lane 3 motorists.

All the points listed above indicate that the visual overlapping that now exists will unlikely lead to any identifiable adverse road safety effects due to the relationship between the billboard and the primary traffic signal. This means that if an examination of the road safety effects of the existing operation of the Billboard confirms this proposition, then there would be no reason to suggest that this would change as a consequence of the proposed change to the dwell time.

If there were to be a potential effect, it would be that a driver in Lane 1, or possibly but less likely in Lane 2, might fail to observe or comprehend a change in signal display from green to amber. There can be no other effect produced. If the traffic signal was already displaying an amber signal before moving into the visual overlap area, then the approaching driver would be aware of that amber display, and would already be in the process of responding to it regardless of when it changes to a red. Similarly, if the traffic signal was already displaying a red signal before moving into the visual overlap area, then the approaching driver would be aware of that red display before moving into the visual overlap area, and would already be in the process of responding to it regardless of when it changes to a green.

As explained above, in the case of the Lane 1 approach, any signal change from green to amber while within the visual overlap area which was either not observed or comprehended, would unlikely have any effect on the driver because that driver would already be within the ASD distance, which means that the driver would already be committed to either stopping or proceeding, regardless of any signal change. Put another way, even if a driver was to observe a change from green to amber while within the ASD distance, that driver would already be aware of not having the road space available to perceive and then physically respond by bringing the vehicle to a halt before entering into the intersection.

In the case of Lane 2, there is visual overlapping that occurs prior to reaching the ASD area, this being over an approximately 30m distance between about 168 and 138m from the billboard (i.e. about 78m and 48m from the limit line). However, when travelling in Lane 2, both the dual primary and the secondary sit clearly within a driver's vision, with the primary and tertiary providing support roles, all as is apparent in Figure 12 and Figure 13 as previously referred to. In other words, even if a change in image on the Billboard occurred simultaneously with a signal change from green to amber, and that the new image displayed also happened to have an amber background, it is highly unlikely that a driver approaching in Lane 2 would fail to be informed by at least one of other three traffic signals that are directed to that approach, and which (at the distances involved) all sit clearly within a driver's central vision.

All these points can be readily verified by examination of the 4.2-year crash history on the approach to the Billboard since it first became operational on 22 December 2021. It is noted

that with the recorded southbound traffic volume of around 12,780 vehicles per day, there would have been around 17 million vehicles that have travelled through the intersection during the period that the Billboard has been operating. With this level of exposure, if the existing operation of the Billboard was creating road safety issues for drivers, then it would almost inevitably be evident in the crash data. Accordingly, the following section of this report examines the crash history in detail.

4 Road safety

4.1 Crash records since establishment of the billboards

In order to examine the extent of any direct road safety impacts of the Billboard, the NZTA Crash Analysis System (“CAS”) database has been examined for all crashes that have occurred within the extent of the approach that is potentially affected by the visual overlapping between the southbound primary signal and the subject billboard. This search covered the 4.2-year period that the Billboard has been operating, i.e. 22 December 2021 to the search date of 26 February 2025.

This search revealed a total of 19 crashes, with four having occurred on the southbound approach near to the off-ramp intersection, ten having occurred within or closely proximate to the intersection, and five on the off-ramp.

Figure 19 below shows the extent of the crash search area (shaded light blue), and the grouped locations of the crashes as output from CAS.



Figure 19: CAS crash search since billboard establishment (22 December 2021 to 26 February 2025).

An extract from the CAS 'plain English' summary of each crash is provided in Table 2 as follows.

Crash road	Dis Dir	Side road	ID	Date	Description of events	Crash factors	Fatal	Serious	Minor	
MT WELLINGTON HWAY	16	S	MT WGTN OBR	2023271368	27/09/2023	Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY changing lanes to left hit Truck2	CAR/WAGON1, incorrect merging/diverging manoeuvre, overseas/migrant driver fail to adjust to nz roads	0	0	0
MT WELLINGTON HWAY	12	S	MT WGTN OBR	2022219623	21/04/2022	Van1 SDB on MOUNT WELLINGTON HIGHWAY hit rear end of Unknown2 stop/slow for queue	VAN1, failed to notice car slowing, stopping/stationary	0	0	0
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	2022230021	14/07/2022	Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY hit rear of Truck2 SDB on MOUNT WELLINGTON HIGHWAY turning right from left side	CAR/WAGON1, travelled straight ahead from turning lane or flus	0	0	0	
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	2022300651	21/11/2022	Car/Wagon2 turning right hit by oncoming Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY	CAR/WAGON2, failed to give way turning to non-turning traffic	0	0	0	
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	2024290797	23/06/2024	Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY lost control turning right but did not leave the road, Car/Wagon1 hit raised median	CAR/WAGON1, cutting corner at intersection, fatigue due to long day (working/recreation)	0	0	0	
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	2023272628	8/11/2023	Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY hit rear of Car/Wagon2 SDB on MOUNT WELLINGTON HIGHWAY turning right from left side	CAR/WAGON1, travelled straight ahead from turning lane or flus	0	0	0	
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	2022239361	28/10/2022	Car/Wagon1 WDB on MOUNT WELLINGTON HIGHWAY lost control turning right; went off road to left, Car/Wagon1 hit traffic signal	CAR/WAGON1, alcohol test above limit or test refused, other fatigue, too far right	0	0	0	
MT WELLINGTON HWAY	I	MT WGTN HWY OFF RAMP	202221906	11/05/2022	Car/Wagon1 SDB on Mount Wellington Highway hit Truck2 turning right onto AXROAD from the left	CAR/WAGON1, did not stop at steady red light	0	0	1	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2024282457	3/03/2024	Ute1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit rear end of Car/Wagon2 stop/slow for signals	UTE1, attention diverted by passengers	0	1	4	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2023245712	15/01/2023	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit Bus2 crossing at right angle from	CAR/WAGON1, did not stop at steady red light, speed entering corner/curve	0	0	1	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2023272297	24/10/2023	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP lost control turning right but did not leave the road, Car/Wagon1 hit traffic signal	CAR/WAGON1, cutting corner on bend, other fatigue	0	0	0	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2023281542	22/12/2023	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP lost control; went off road to left, Car/Wagon1 hit traffic signal	CAR/WAGON1, other lost control	0	0	0	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2022214612	22/02/2022	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit SUV2 crossing at right angle from right	SUV2, did not stop at steady red light, failed to notice control, other fatigue CAR/WAGON1, alcohol suspected	0	0	4	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2023253713	7/04/2023	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP lost control turning right; went off road to left, Car/Wagon1 hit raised median, traffic signal	CAR/WAGON1, alcohol test above limit or test refused, lost control when turning, speed approaching a traffic control	0	0	0	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2024290148	17/06/2024	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP lost control turning left; went off road to right, Car/Wagon1 hit traffic island, retaining wall	CAR/WAGON1, alcohol suspected, drugs suspected, lost control avoiding another party, speed entering corner/curve	0	0	1	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2024288769	2/06/2024	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP missed inters or end of road, Car/Wagon1 hit new jersey barrier	CAR/WAGON1, speed entering corner/curve	0	0	0	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2022217167	26/03/2022	Car/Wagon1 NDB on MOUNT WELLINGTON HWY OFF RAMP hit turning Car/Wagon2	CAR/WAGON2, did not stop at steady red light, other brakes	0	0	0	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2024314760	23/12/2024	Car/Wagon1 and SUV2 both WDB on MOUNT WELLINGTON HWY OFF RAMP and turning; collided	CAR/WAGON1, cutting corner at intersection, other inattentive	0	0	1	
MT WGTN HWY OFF RAMP	I	MT WELLINGTON HWAY	2022218802	4/04/2022	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit rear end of SUV2 stop/slow for signals	CAR/WAGON1, attention diverted by cell phone, failed to notice car slowing, stopping/stationary, new driver/under instruction	0	0	0	

Table 2: CAS extract of crash summaries

A summary of the crash types is provided in Table 3 as follows:

Crash Type	No. Crashes	Non-Injury	Minor Injury	Serious Injury
SB MWH using wrong lane and/or lane change	3	3		
SB MWH fail to stop for red signal	3	1	2	
SB MWH lost control turning	1	1		
SB MWH rear end	1	1		
Sub-total southbound	8	6	2	0
WB Off-ramp rear end	2	1		1
WB Off-ramp fail to stop for red signal	1		1	
WB Lost control turning onto MWH	6	5	1	
WB side-swipe while turning	1		1	
NB MWH illegal turn	1	1		
Sub-total westbound or northbound	11	7	3	1

Table 3: Crash type summary since billboard establishment (22 December 2021 to 25 February 2025).

Points to note from the crash history are as follows:

- a) Of the 19 crashes recorded within the crash search area over the past 4.2 years, over half (11 of 19) involved the at-fault driver not travelling southbound on MWH; leaving only 8 crashes where there could possibly have been an influence due to the Billboard.
- b) Of the 8 crashes involving the at-fault driver travelling south on MWH, five involved crash types and/or lane use that are highly unlikely to have been influenced by the Billboard. These five crashes involved travelling through from a turn lane / lane changing (3), loss of control while turning right (1), and a rear-end incident (1). It is noted that all five of these crashes involved the at-fault driver being in Lane 3, which as previously described is the approach lane where there is little or no likelihood that the driver would be looking to the left toward the primary signal in preference to the more obvious and appropriately aligned dual primary and secondary signals.
- c) The remaining three crashes involving the at-fault driver travelling south on MWH and failing to stop for a red signal. These are the only crashes where the crash type and/or lane use would provide for the possibility of influence by the Billboard.

An examination of the Police Crash Reports, including driver statements, for each of these three crashes provides no reference to, or suggestion of, the Billboard having in any way influenced the crashes, either by way of distraction from the signals, or a failure to comprehend a change in signal from green to amber. The driver statements as recorded in the relevant Police Traffic Crash Reports were as follows:

- a) Crash ID 2022217167
"I saw the light turning red pressed on break but my break didn't work. I turned right"
- b) Crash ID 2022214612
"I was too tired and did not see the red light."
- c) Crash ID 2022217167
"I was distracted and drove through a red light. I've been so stressed with work and everything else going on that I was distracted and didn't even see the light change."

In relation to these three crashes, they are typical of any signalised intersection regardless of the presence or not of a digital billboard. With regard to the latter two crashes in particular, while they do refer to elements of impairment while driving, (i.e. tiredness and stress respectively), neither refers to any influence of the Billboard as a factor in the failures of the drivers to be fully focused on the driving task.

It is noted in this regard however, that during the consultation discussions with Council and AT traffic representatives, it was suggested that the drivers in each case may have also been impaired by the visual overlapping between the primary traffic signal and the Billboard, but were either not aware of that additional impairment or were not prepared to refer to that additional impairment when giving their statement to the Police. It is considered, however, that in the complete absence of any such references in the applicable Police Crash Reports, the suggestion is both unhelpfully speculative and unlikely in practice.

Further, and as will be described in the section below, the average annual rate of these crashes at 0.72 per annum is actually less than the rate of 1.2 per annum of the same crash type that occurred during the comparable 4.2-year period preceding the establishment of the billboard.

Overall, it is considered that the examinations of recorded crashes since the Billboard has been operating all confirm no identifiable reason to suggest that it has been operating unsafely. Given the demonstrably safe operation of the Billboard with a 30-second dwell time, there is accordingly nothing to suggest that reducing the dwell time to 8-seconds, (with no other changes proposed), will cause the Billboard to suddenly operate unsafely.

Further, there is nothing about the road safety records at this location, nor from examination of the New Zealand-wide crash records, (noting that the considerable majority of the more than 1,000 digital advertising screens currently operate with an 8-second dwell time), to suggest that a reduction in the operational minimum dwell time to 8-seconds cannot be achieved in a manner that similarly results in no identifiable adverse road safety outcomes. Section 5 below provides further detail on the nationwide crash data that relates to signs, including digital billboards.

4.2 Comparison of before and after crash patterns

As an extension of examination of the road safety performance of the existing operation of the Billboard, a further road safety analysis has been undertaken to compare overall crash numbers and crash patterns as experienced in the 4.2 years since to establishment of the Billboard (as described above), with a similar 4.2-year period prior to its establishment, (at which time the billboard was a 'static' stretched skin billboard.

The prior 4.2-year period (21 October 2018 to 21 December 2021) revealed a total of 21 crashes. Figure 19 shows the grouped locations of crashes as provided by CAS, while Table 4 below it provides an extract from the CAS plain English summary of the 21 crashes.



Figure 20: Crashes prior to billboards: 5 years 22 December 2016 – 22 December 2021

Crash road	Dis Dir	Side road	ID	Date	Description of events	Crash factors	Fatal	Serious	Minor
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	201954690	23/01/2019	Truck1 SDB on MOUNT WELLINGTON HIGHWAY hit Car/Wagon2 turning right onto AXROAD from the left	TRUCK1, did not stop at steady red light, speed on straight	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	201986584	2/12/2019	Truck1 SDB on MOUNT WELLINGTON HIGHWAY changing lanes to left hit Car/Wagon2	TRUCK1, incorrect merging/diverging manoeuvre	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	201954697	23/01/2019	SUV1 SDB on MOUNT WELLINGTON HIGHWAY hit Truck2 turning right onto AXROAD from the left	SUV1, alcohol test below limit, did not stop at steady red light	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	201966675	11/09/2019	Car/Wagon1 and Truck2 both WDB and turning; collided	CAR/WAGON1, alcohol test above limit or test refused, did not check/notice another party from other dirn, too far left TRUCK2, alcohol test above limit or test refused	0	0	1
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	2021221620	13/06/2021	Ute1 SDB on MOUNT WELLINGTON HIGHWAY hit rear end of SUV2 stopped/moving slowly	UTE1, following too closely	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	201895911	1/12/2018	Car/Wagon1 SDB on MT WELLINGTON HWAY hit rear end of Car/Wagon2 stopped/moving slowly	CAR/WAGON1, failed to notice car slowing, stopping/stationary	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	2020146433	22/02/2020	Van1 SDB on MOUNT WELLINGTON HIGHWAY hit Car/Wagon2 turning right onto AXROAD from the left	VAN1, did not stop at steady red light CAR/WAGON2, alcohol test below limit	0	0	1
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	2021203833	24/10/2021	Ute1 SDB on MOUNT WELLINGTON HIGHWAY hit Ute2 turning right onto AXROAD from the left	UTE1, did not stop at steady red light, other inattentive	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	2020162241	29/05/2020	Car/Wagon1 NDB on MT WELLINGTON HIGHWAY hit rear end of Truck2 stopped/moving slowly	CAR/WAGON1, misjudged another vehicle, other inattentive	0	0	0
MT WELLINGTON HWAY		I MT WGTN HWY OFF RAMP	2020169398	4/07/2020	Car/Wagon1 SDB on MOUNT WELLINGTON HIGHWAY overtaking hit Car/Wagon2 SDB on MOUNT WELLINGTON HIGHWAY turning right	CAR/WAGON1, non-compliance with regulatory device with sign or, travelled straight ahead from turning lane or flus	0	0	0
MT WELLINGTON HWAY	10	N MT WELLINGTON HWAY	2020166494	2/10/2020	Car/Wagon1 NDB on MT WELLINGTON HWAY hit rear end of Car/Wagon2 stopped/moving slowly,	CAR/WAGON1, alcohol test above limit or test refused, following too closely	0	0	1
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2021225044	5/11/2021	Car/Wagon1 SDB on MOUNT WELLINGTON HWY OFF RAMP hit rear of left turning SUV2 SDB on MOUNT WELLINGTON HWY OFF RAMP	CAR/WAGON1, following too closely	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2018100912	3/12/2018	Truck1 and Car/Wagon2 both SDB on MOUNT WELLINGTON HWY OFF RAMP and turning; collided	CAR/WAGON2, other postion on road	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2018101501	13/12/2018	Truck1 and Car/Wagon2 both SDB on MOUNT WELLINGTON HWY OFF RAMP and turning; collided	CAR/WAGON2, new driver/under instruction, too far right	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2021205612	23/10/2021	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit rear end of Car/Wagon2 stop/slow for signals	CAR/WAGON1, alcohol suspected, failed to notice car slowing, stopping/stationary, ENV: heavy rain	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2020146460	26/02/2020	SUV1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit rear end of Car/Wagon2 stop/slow for cross	SUV1, failed to notice car slowing, stopping/stationary, other inattentive	0	0	1
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2021233849	16/12/2021	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP hit Truck2 reversing along road	TRUCK2, did not check/notice another party behind	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2020156247	26/06/2020	Truck1 and Car/Wagon2 both WDB on MOUNT WELLINGTON HWY OFF RAMP and turning; collided	CAR/WAGON2, other misjudged speed, distance or position, overtaking on left without due care	0	0	0
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2020171206	25/11/2020	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAMP lost control turning right but did not leave the road. Car/Wagon1 hit concrete	CAR/WAGON1, lost control when turning, ENV: slippery road due to rain	0	0	1
MT WGTN HWY OFF RAMP		I MT WELLINGTON HWAY	2021203269	23/10/2021	Car/Wagon1 WDB on MOUNT WELLINGTON HWY OFF RAM hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, did not stop at steady red light CAR/WAGON1	0	0	0
SOUTHERN MOTORWAY	5	E MT WGTN OBR	2020176286	10/07/2020	Car/Wagon1 EDB on SOUTHERN MOTORWAY changing lanes/overtaking to right hit Left scene2	CAR/WAGON1, incorrect merging/diverging manoeuvre	0	0	0

Table 4: Crashes for the prior 4.2-year period

The 21 crashes over the 4.2 years prior to operation of the Billboard equates to an annual average crash rate of 5.0 per annum, which compares to 4.5 per annum after the Billboard was established. While the after-period crash rate has reduced from the prior-period, the rates are not dissimilar. The important outcome is that the crash rate has not increased following operation of the Billboard.

In terms of the crash types, these are compared and summarised in Table 5 below. As will be seen, the changes associated with each crash type are generally small. Those of particular relevance to the Billboard are the southbound crashes that involved either a failure to stop for a red signal, or a rear-end crash. With the former there was a reduction by two from 5 to 3; and with the latter there was a reduction by one from 2 to 1. Importantly in relation to the Proposed Variation, there is nothing to indicate that the existing operation of the Billboard has had any compromising effect to either of these two crash types, and hence there is nothing to extrapolate from to suggest that the proposed reduction to an 8-second dwell time cannot also occur without identifiably compromising road safety.

Crash Type	Prior-Period	After-Period	Change
SB MWH using wrong lane and/or lane change	3	3	-
SB MWH fail to stop for red signal	5	3	-2
SB MWH lost control turning	0	1	+1
SB MWH rear end	2	1	-1
Sub-total southbound	10	8	-2
WB Off-ramp rear end	3	2	-1
WB Off-ramp fail to stop for red signal	0	1	+1
WB Lost control turning onto MWH	1	6	+5
WB side-swipe while turning	3	1	-2
Misc	5	1	-4
Sub-total westbound or northbound	11	11	-

Table 5: Crash type summary since billboard establishment (22 December 2021 to 25 February 2025).

5 General Road Safety Implications of Digital Billboards

Given that the considerable majority of digital advertising screens in New Zealand operate with an 8-second dwell time, and given that several hundred of the 1,000+ digital advertising screens are at or proximate to signalised intersections, it is feasible to gain a strong indication of the road safety acceptability of the 8-second dwell time by searching the crash data for any indication that digital advertising signs in general are contributing to crashes.

Digital billboards have been operating in New Zealand for 13 years since 2012. This duration of operation provides a sound appreciation of their actual road safety implications. Accordingly, in order to further this understanding, a search was made of the NZTA CAS database for all crashes in New Zealand for the period 2012 to 2025⁵. In this search, contributing cause factor 356 (*“attention diverted by advertising or signs”*) has been focused on. It is noted in this regard that this code picks up any crash that is related to distraction by any sort of sign, not just advertising signs, i.e. it includes traffic signs, road works signs, directional signs, street name signs, and so on.

The CAS database produced a list of 86 crashes throughout the country where the crash involved, or was interpreted to involve, distraction due to a sign. Each of these crashes has been examined in detail by referencing the Police comments and driver statements that are contained in each individual Police Crash Report, and where necessary cross-referencing to what actually exists at the crash locations.

An examination of each crash revealed the following categories of signs associated with the *‘attention diverted by advertising or signs’* crashes:

⁵ Search date 21 January 2025

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.	17
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 / motorway gantry sign.	18
Personal / community	Election hoarding / community noticeboard / place identification / protest sign.	6
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.	18
Total		86

Table 6: 'Attention diverted by advertising or signs' crashes 2012-2025

The table above shows that in the whole of New Zealand there have been 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.

In saying this, it is also relevant to put the number of sign-related crashes into perspective. During the 13-year search period there was an overall total of 421,400 recorded crashes in New Zealand. Even if the combined total of 21 crashes involving some sort of advertising is considered (that is, the 4 static third-party advertising signs, and the 17 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.

To put the 21 advertising sign-related crashes into further perspective, the CAS data reveals that a driver is:

- a) 13.5 times more likely to have a crash due to a wheel coming off the vehicle being driven;
- b) 116 times more likely to have a crash due to looking at scenery or people outside the vehicle; and
- c) 820 times more likely to have a crash due to an in-vehicle distraction.

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 (scenery as an example), or elements internal to the vehicle (cellphones as an example).

It is also noted in this regard that research from Queens University in Ireland found that while distraction due to objects inside the vehicle (particularly the use of cell phones and in-car technology) are under-reported and hence under-represented as a crash factor, no such

difference was found with regard to outside the vehicle distraction.⁶ This further supports the analysis of individual crash records as providing a useful tool to understand the potential impact of third-party advertising on driver attention and safety.

Some research⁷ 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 (but does not prove) 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.

The lack of crashes relating to digital billboards is also evident when a broader examination of crash histories is undertaken (usually in relation to post-implementation monitoring conditions related to consented digital billboards). Such studies often 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.

Based on numerous monitoring studies that have been undertaken, even when examinations are made that look beyond the face of the crash records to overall influences, it has been consistently found that there are no identifiable road safety impacts due to the establishment of digital advertising signs / digital billboards.

From these analyses the following can be concluded:

- a) Digital advertising signs / digital billboards are not a new phenomenon that we know nothing about. Rather, there is now a significant database of digital billboards to examine, which provides the advantage of being able to directly observe, measure and evaluate their actual effects. This is, of course, far preferable to inferring potential effects from theoretical studies, or making assessments based on unfounded perceptions.
- b) Digital advertising signs and digital billboards are not featuring at all in the crash statistics.
- c) Based on numerous monitoring studies that have been undertaken, there are no sites where digital sign operations have resulted in any identifiable adverse change to overall crash numbers, crash patterns, or crash severities.
- d) There is no evidential basis for suggesting that drivers do not admit to, or are unaware of, being distracted by an advertising sign, especially given that so many other external and internal distractors have made their way into the crash statistics.

The key point to be made from all the above is that despite perceptions to the contrary, relevant research and empirical evidence confirms that digital billboards, operated as they do in New Zealand with predominantly 8-second dwell times, do not generate identifiable adverse road safety effects, even when concerted efforts are made to find those effects.

⁶ 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).

⁷ Including Young *et al* (2015), Goodsell *et al* (2018), and Cunningham *et al* (2016).

The evidence therefore strongly indicates that digital billboards present a negligible level of road safety risk to road users.

6 Dwell Time

6.1 Dwell time research

The international research that is specific to dwell times is sparse. However, there is a study published by Goodsell *et al* from the Australian Road Research Board (“ARRB”)⁸ that involved an evaluation of the impact on driving performance of new digital billboard installations at two traffic signalised intersections in Queensland. While it is understood that neither of the intersections examined included any visual overlapping, the study is relevant to this assessment of dwell time because at each of the two digital billboard sites that were evaluated in detail, six different dwell times were examined being 8, 10, 16, 20, 24 and 30 seconds.

Extracts from its findings are provided as follows:

“Contrary to a hypothesis that digital billboards at demanding locations will inevitably create enough distraction to negatively affect vehicle control performance, the current evaluation found that, at all dwell times, vehicle lateral control performance either improved or was unaffected by the digital billboard’s presence”.

[underlining added]

“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 added]

What this ARRB research is in effect saying, is that digital billboards are not inherently hazardous to safety performance and that no road safety benefit (in terms of driver safety performance), is achieved through longer dwell times. This is an important and particularly relevant finding as it is the only empirically-based research that has assessed the relative road safety performances of different dwell times.

An occasionally posited position regarding dwell times is that drivers should see no more than one image change, as it would reduce safety if a driver was exposed to more than one image change. This position appears to have originated from an earlier (2013) ARRB document that attempted to bring together a common set of recommended standards from the digital billboard standards and guidelines that various roading authorities in Australia were applying at that time.⁹

⁸ Goodsell R, Dr Roberts. P (2018) “On-Road evaluation of the driving performance impact of digital billboards at Intersections” Project No. PRS17074 – ARRB

⁹ ARRB “Impact of Roadside Advertising on Road Safety”, AP-R420-13 (2013)

However, it appears that a key reason for the suggestion that the number of drivers who see an image change should be minimised comes from another of their recommendations that the transitions between images should be instantaneous. That thinking no longer applies (certainly in New Zealand), because of the fact that instantaneous transitions can create a visual 'flick' that does have the potential to attract the involuntary attention of a driver. It is for this reason that almost universally in New Zealand, it is a requirement that digital billboards operate with a transition between images that involves a 0.5-second cross dissolve, which produces a subtle change in images that does not materially catch the involuntary attention of passing drivers.

It is also perhaps of some interest that the lead ARRB researcher who recommended in the 2013 document that drivers should not see more than one image change, later went on to participate in ARRB's 2018 empirical research regarding dwell times wherein it was found that there is in fact no road safety advantage to having longer dwell times.

6.2 Dwell time practice in New Zealand

There are currently over 1,000 digital advertising screens in New Zealand. The considerable majority of these screens operate with a minimum 8-second dwell time.

The common use by the billboard industry in New Zealand of an 8-second dwell time did not come about by accident.

At the time that the first digital billboards were being contemplated for use in New Zealand around 2012, there was a range of dwell times being applied by overseas jurisdictions that typically ranged between 5-seconds and 30-seconds, with a majority of jurisdictions landing on a dwell time of either 8 or 10 seconds. However, there was generally no foundation to the dwell times that were adopted.

Accordingly, in order to establish what an appropriate and acceptable dwell time would be to apply in Auckland, (particularly given the upcoming Unitary Plan at that time), some practical trials were undertaken in 2012.

These trials were undertaken jointly by a group of specialists from a range of disciplines who represented Council, AT, consultants and billboard operators. This group tested, measured, and assessed various display characteristics in both daytime and night-time conditions. The outcome of those trials was the identification of practicable and appropriate operational characteristics that would be acceptable both to billboard operators and Council and AT.

Based on those trials, which were informed by international experience, the minimum image dwell time of 8-seconds was identified, along with related operational characteristics of 0.5-second dissolve transitions and controls on luminance including responsiveness to ambient lighting conditions.

Since those trials, digital billboards that operate with a dwell time of 8 seconds and a 0.5-second dissolve transition have been widely adopted by many territorial local authorities throughout New Zealand, and by all billboard operators.

6.3 The proposed dwell time variation

As noted, the Proposed Variation seeks a change to the minimum dwell time for the Billboard from 30-seconds as existing, to 8-seconds as proposed. It is intended that the 8-second dwell time will apply at all times of the day as occurs for the considerable majority of digital billboards that operate elsewhere in Auckland and throughout New Zealand.

During the course of discussions with Council and AT traffic representatives regarding the Proposed Variation, an attempt was made to address their concerns by putting to them an alternative proposal that involved two sets of dwell times, being:

- a) 8-seconds between 6am and midnight on weekdays, and between 10am and midnight on weekend days; and
- b) 30-seconds between midnight and 6am on weekdays, and between midnight and 10am on weekend days.

That consideration was based on southbound travel speeds. During the daytime periods, the 85th percentile speeds were found to be lower during the day than they were at night. During weekdays the daytime average 85th percentile speed was 53km/h compared to 56km/h during nighttime hours; and during weekend days the daytime average 85th percentile speed was 54km/h compared to 57km/h during nighttime hours¹⁰. As apparent, the differences between daytime and nighttime speeds are not great, being 3km/h in both cases. This quantum of difference is reasonably typical of what occurs anywhere in Auckland.

The relevance of the southbound travel speeds to the Billboard's dwell time arose due to concerns expressed by Council and AT traffic representatives regarding the survivability of side-impact crashes involving a vehicle turning right from the off-ramp being hit by a vehicle travelling south through the intersection on MWH. While it is correct that the survivability of side-impact crashes is speed dependent, the relevance of this concern to the Billboard and its dwell time is, from an evidential perspective, at best, tenuous, and more likely simply speculative.

What Council and AT traffic representatives have argued is that when compared to the existing Billboard's 30-second dwell time (which demonstrably has not resulted in side-impact crashes that have resulted in serious injury or death), the 8-second dwell time will increase that likelihood by virtue of southbound drivers having a higher probability of experiencing an image change. This concern is, however, without any evidential basis. The following points are noted in this regard:

- a) There is no known international empirical research to suggest that the presence of digital billboards somehow causes drivers to fail to observe or respond to a traffic signal, and neither is there any known empirical research to suggest that when there is some degree of visual overlapping between a billboard screen and a traffic signal lantern, that digital billboards will operate any more or less safely regardless of the applicable dwell times.
- b) In the 13 years of digital billboard operations in New Zealand with the 1,000+ digital advertising screens that now exist, there is no evidence whatsoever that a digital billboard has caused a crash by distracting a driver in some way. By extension, there is certainly no evidence that a driver has failed to observe or respond to a signal change because of the presence of a digital billboard or during the 0.5-second transition between billboard images.
- c) As was described in Section 4.1 above, during the 4.2-year period since the Billboard became operational with its current 30-second dwell time, during which time some 17 million vehicles have travelled southbound through the intersection, three side impact

¹⁰

Refer Figure 4 of this report

crashes were recorded, none of which involved either a serious injury or death, and none of which have either cited or inferred that the presence of the billboard has been a contributing factor.

- d) When comparing the number of side-impact crashes that have occurred at the intersection over the 4.2 years either side of when the Billboard has operated digitally, it actually shows a reduction from an average of 1.2 per annum to 0.72 per annum. While the quantum of the decrease is perhaps not particularly significant in relation to the 4.2 year durations as examined, importantly and significantly, it does not show an increase.

For all these reasons, it is considered that there is no evidence to support a concern that a reduced dwell time (and more frequent image changes) will result in a higher likelihood of side-impact crashes.

Accordingly, and given the all the relevant evidence as described in this report, the Proposed Variation seeks an 8-second minimum dwell that will apply during all periods of the day. The proposed amendment to Condition 10 has been developed accordingly.

Aside from the amended Condition 10, all other billboard operational conditions as currently required by LUC60326896-A (i.e. Conditions 4, 5, 6, 7, 8, 9, 11, 12, 13 and 14) remain applicable.

6.4 Consistency with AUP Standards & TCDM3 Recommendations

The AUP contains no specific standards that relate to dwell time.

TCDM3 refers to a minimum image dwell time as a trigger for further assessment. This occurs in its Section 6.3 under its sub-heading of '*Animated, flashing and variable message signs*', wherein it states:

"...proposals to install variable message signs should be carefully assessed where:

The minimum time for any separate display is less than five seconds".

This criterion therefore implies an element of acceptability of image dwell times that go as low as 5-seconds. There is, therefore, nothing about an 8-second dwell time that is contrary to TCDM3 expectations.

7 Responses to Council and AT Concerns

7.1 Background

As previously noted, the responses to the Proposed Variation as received from Council and AT are summarised in the Pre-app Memo. The key matters identified for non-support of the Proposed Variation include:

- a) The measured travel speeds on MWH, and the likely survivability of side impact crashes at the off-ramp intersection, and the safety of pedestrians;
- b) The dwell time reduction increasing the probability of distraction to drivers;
- c) The veracity of the data contained in the CAS database;
- d) The possibility that the Billboard has already contributed to crashes.
- e) The potential for driver distraction due to the Billboard

- f) The layout of the traffic signals at the off-ramp intersection.
- g) The concern of a flow-on effect (congestion and delay) on the motorway if a crash occurs.

Each of these matters is addressed as follows:

7.2 Travel speeds and survivability of side-impact crashes

Several references are made to the measured speeds of southbound vehicles as they emerge from the off-ramp intersection, and the survivability of any crashes involving a side impact between a southbound vehicle on MWH, and a westbound vehicle emerging from the SH1 off-ramp, and survivability for pedestrians

The concern relating to side impacts has been previously referred to in Section 6.3 above.

The Proposed Variation will have no impact on travel speeds through the intersection, or the survivability of any side-impact crashes at the intersection.

As described in Section 4.1 above, there have been no crashes that have occurred since the Billboard was established over 4 years ago that have been attributable to the presence of the Billboard; and there is no evidential basis to suggest that the adoption of an 8-second dwell time will change that situation.

As described in Sections 4.1 and 6.3 above), when looking at the potential for side-impact crashes due to a southbound driver on MWH failing to stop for a red signal, the crash rate for this type of crash has actually reduced from 1.2 per annum prior to operation of the Billboard, to 0.72 per annum since. Even allowing for the random nature of crashes, the very important point to note is that there is no evidence that the Billboard has contributed to an increase in crashes with vehicles turning from the off-ramp, either by way of any direct reference to such, or by way of crash numbers. Based on the nil effects of this crash type due to a 30-second dwell time, there is no credible basis to suggest that this will be any different for an 8-second dwell time, especially given that the very large number of digital advertising screens in New Zealand that operate with an 8-second dwell time (estimated to be over 900), have never (based on the analysis provided in Section 5 above) identifiably caused or contributed to a crash anywhere in New Zealand over the whole history of digital billboard operations in New Zealand.

It is also relevant that when looking at crash survivability models, to ground them to the particulars of a location, so that some degree of perspective is maintained. For example, in the past 45 years of data that is held in the CAS database, (i.e. 1980 – 2025), it shows that within a 30m radius of the MWH southbound / SH1 off-ramp intersection (which happens to also include the MWH northbound / SH1 on-ramp intersection), there have been 173 recorded crashes. None involved a fatality.

Of the total of 173 crashes, 53 involved a southbound MWH driver failing to comply with the traffic signals at the off-ramp intersection. Where an injury was recorded, only six over the past 45 years involved a serious injury, with none of these occurring while the Billboard was operating digitally.

In response to the concern expressed about the survivability of side-impact crashes at this intersection, the actual occurrence of injury-resulting crashes is low, and based on all of the above analysis, there is little foundation to any suggestion that a reduced dwell time for the Billboard will cause an identifiable change from the existing situation.

In relation to pedestrian safety effects, it is highly unlikely that the Proposed Variation will impact on pedestrian safety for the reasons that:

- a) Pedestrian volumes at the intersection are negligible. Indeed, having observed the site and its traffic operations and characteristics for many hours on numerous occasions over the past several years, not one pedestrian has ever been observed.
- b) There are no pedestrian crossing facilities provided at or near the intersection (such as the inclusion of pedestrian cross-walks or signal controls). This simply reflects the fact that neither pedestrian desire lines nor pedestrian demands warrant such facilities. This most especially applies to the crossing of MWH at the off-ramp intersection, as there are no footpaths available on the western side of MWH near to the intersection, and certainly nowhere for pedestrians to go to or come from on the western side of MWH. It is noted in this regard that if there was any desire for a pedestrian to cross MWH, it would almost certainly be met at the MWH / Sylvia Park Road intersection to the south of the site, where there are at least footpaths on both sides of MWH and the potential for some desire lines to exist.
- c) The only potential for pedestrian traffic at or near the intersection is in the north-south direction on the eastern side of MWH where a footpath is provided, including under the motorway overbridge, although as noted there is no provision for pedestrians within the off-ramp signal controlled intersections with MWH. Any north-south pedestrian movements that do occur along the eastern side of MWH cannot possibly have their safety compromised by the Proposed Variation because the Billboard is only directed at the southbound traffic flow which does not in any way interact with the parallel north-south movement of pedestrians along MWH.

Having investigated the concern raised in the Pre-app Memo regarding pedestrian safety, it is considered that there is no basis for such a concern either in terms of how the intersection currently operates (with no pedestrian activity or road features) or in the future (should any pedestrian features be introduced).

7.3 Increased distraction from a reduced dwell time

It is stated in the Pre-app Memo that: “...a dwell time reduction will increase the possibilities of distractions to the drivers.”

As far as is known, there is no research to indicate that with digital billboards as they are operated in New Zealand, including in this case, that a change of image increases distraction. In fact, there is little probative evidence available internationally to suggest (again in terms of how they are operated in New Zealand) that digital billboards ‘distract’ drivers to the extent that they compromise road safety. Certainly the New Zealand crash data suggests very strongly that they do not.

This is for three reasons:

- a) Firstly, the use in New Zealand (as occurs with the subject Billboard) of 0.5-second cross-dissolve transitions. These transitions provide subtle change from one image to the next that do not create a visual ‘flick’ as would occur if the transitions were instantaneous. The effect of the dissolve transitions is that they do not catch the involuntary attention of passing drivers, and in this regard do not create a distraction.

- b) Secondly, drivers typically do not allow themselves more than a momentary glance at elements of the surrounding environment that do not contribute to the driving task. These momentary glances have been measured in an Australian study to be up to only 0.75 seconds¹¹. Drivers simply do not fixate on advertisements, regardless of how attractive they might be, especially in anticipation of seeing what the following advertisement might display. One has only to think about one's own driving experience when passing a digital billboard to know that this is the case.
- c) Thirdly, the most relevant and comprehensive research into the effects of digital billboards that are located proximate to signalised intersections was undertaken by the Australian Road Research Board.¹² That research demonstrated no adverse road safety effects due to the billboards. In fact, it suggested some overall beneficial effects, likely due to the fact that the digital billboards increased a driver's awareness of the surrounding traffic environment in preference to either day-dreaming or focusing on less desirable distractions internal to the vehicle such as in-car infotainment or cellphones. Interestingly, that same research also concluded that there are no road safety advantages to longer dwell time, having tested a range of dwell times including 8 seconds and 30 seconds.

7.4 Veracity of the CAS database

The comment is made in the Pre-app Memo that “...*police's record for the reasons of the crash are heavily reliant on the drivers' statements which does not specify billboards*”. This statement is, with respect, both unsubstantiated and essentially incorrect. At face value, it seems to suggest that the lack of any evidence from the CAS database of road safety impacts due to digital billboards is a consequence of a lack of veracity of the information that is collected by the reporting Police officers. However, this contention is unsupported by any facts or research.

Section 5 of this report comprehensively addresses this matter. The point is clearly made therein that there is no reason why a driver would not refer to distraction by a digital billboard as a factor in a crash, (which is a crash factor that can be coded in the database as a factor that involves “attention diverted by advertising or signs”), any more or less than they would in referring to the very many other potential distractors that are routinely referred to such as other people, buildings, roadworks, traffic signs, etc. That is, a driver is no more or less responsible for a crash whether they were distracted by a digital billboard or by any other external factor, and therefore there is no reason why a person would be less likely to admit distraction by a billboard.

7.5 The Billboard as a potential contributor to crashes

It is stated in the Pre-app Memo that some of the “*several existing crashes between south bound highway and the motorway offramp, in which drivers attributed crashes to distraction / stress...may be potentially due to the billboard operation.*” As previously explained in Section 4.1 above, the suggestion that the crashes that have occurred may have been influenced by the operation of the Billboard is not supported by the statements provided by the drivers in

¹¹ 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

¹² Goodsell R, Dr Roberts. P (2018) “*On-Road evaluation of the driving performance impact of digital billboards at Intersections*” Project No. PRS17074 – ARRB

those crashes; and any interpretation that the Billboard may have been an unreported factor is unsupported by broader crash statistics, the relevant literature, and the lack of reporting of distraction by billboards in New Zealand when compared with copious instances of reporting of other external distractors.

7.6 The potential for driver distraction

It is stated in the Pre-app Memo that “...*distraction at this location may result in the drivers failing to notice traffic light change or failing to change to the correct lanes before entering the intersection, as there is a long distance of overlapping between the billboard and the traffic signal before drivers enter the intersection.*”

The relationship of the traffic signals to the traffic approach to the intersection is existing, and does not change with the Proposed Variation.

This point is comprehensively addressed in Section 3.3 of this report. As noted therein, there is nothing about the reduction in dwell time that will cause any identifiable change to either driver behaviours or driver performances on approach to the intersection, particularly when viewed from Lane 1 which is the lane that the affected traffic signal is primarily directed toward.

7.7 The layout of the off-ramp intersection.

The Pre-app Memo states that “...*most intersections will have overhang arms to provide additional signal displays to allow drivers to see signal displays at different position even when oversize vehicles block the view of one display, the overhang arm displays are also available. But this intersection is located near by the overbridge, no overhang arm displays are provided, which restricts drivers see additional displays.*”

It also states that “*At this site, drivers on MWH southbound do not have good visibility of the off-ramp and cannot see if vehicles on that approach are moving or stopped until they are in the intersection. This means there is limited opportunity for a southbound driver travelling at near 54 km/h to break before a collision.*”

The layout of the intersection as relates to both these points is existing, and does not change with the Proposed Variation.

Further, there is no probative basis to suggest that when compared to the existing 30-second dwell time that currently applies to the Billboard, that an 8-second dwell time will cause the intersection layout as exists to function any less efficiently or safely than it currently does. If there was any evidence from any digital billboard at any location in New Zealand to demonstrate that the presence of a digital billboard causes some sort of material degradation to road safety, then the concerns expressed may have some validity. The reality, however, is that there is no such evidence, particularly when considering that the considerable majority of digital billboards in New Zealand operate with an 8-second dwell time as is sought by the Proposed Variation.

7.8 Motorway effects

The Pre-app Memo expressed a concern regarding “...*the flow-on effect of the crash, i.e. the congestion and delay of traffic movement on the motorway if a crash occurs due to the billboard operation.*”

Potential effects to the function of the off-ramp intersection are possible for any crash that occurs at the intersection (as similarly applies to any off-ramp intersection on the motorway network). The Proposed Variation will not change this, particularly as it is considered that there is no evidential basis to suggest that the reduction in dwell time on the Billboard will generate an increase in crashes at the intersection beyond that which already now exists. The relative road safety performance of the Billboard operating with an 8-second dwell time compared to 30-seconds as existing is a matter that is addressed throughout this report.

8 Summary and Conclusions

As described, this Proposed Variation seeks a reduction of the operational dwell time on the north-facing billboard screen of a northern billboard pair located at 430 & 440 Mt Wellington Highway, from the 30-seconds as currently consented, to 8-seconds.

An examination of the road safety performance of the subject Billboard reveals nothing of concern in relation to its operation that would otherwise call into question the appropriateness of reducing the dwell time as proposed. There is no indication that the past operation of the Billboard has either directly or indirectly contributed to any identifiable compromise to road safety within its traffic environment.

The proposed use of 8-second dwell times is not without basis. This dwell time applies to the vast majority of the existing billboards that operate in a wide range of urban environments within Auckland and elsewhere in New Zealand. This has provided the opportunity for the 8-second dwell time to be widely observed and evaluated. In short, there has been no identifiable situation where road user behaviours or performances have been adversely affected, or road safety in any other way compromised, by the presence of digital billboards that operate with 8-second dwell times.

The 8-second dwell time as sought would also enable alignment with the 8-second dwell times that apply to the other three billboard screens that operate on the same site frontage.

With the Proposed Variation to enable the 8-second dwell time, no modifications or additions to the remaining consent conditions that already apply to the Billboard are necessary.

Based on all the above, it is considered that the Proposed Variation to enable an 8-second minimum dwell time to apply to the Billboard will be appropriate and acceptable from both traffic operations and road safety perspectives. It is fully supported by research and practical trials; it is consistent with industry best practice in New Zealand; and it will ensure that appropriate levels of road safety are maintained.



Brett Harries

17 March 2025