M2 Motorway - Epping
Digital Signage Safety Assessment

Prepared for:

Ethos Urban

1 December 2020

The Transport Planning Partnership

M2 Motorway - Epping

Digital Signage Safety Assessment

Client: Ethos Urban

Version: V02

Date: 1 December 2020

TTPP Reference: 20406

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	30/11/20	Kenta Lam	Santi Botross	Wayne Johnson	
V01	01/12/20	Kenta Lam	Santi Botross	Wayne Johnson	

Table of Contents

Tables

Figures

APPENDICES

1 Introduction

1.1 Overview

Sydney Trains is seeking approval for the installation of LED digital illuminated signs on an existing overhead railway bridge above the M2 Motorway in Epping. The proposed signage is to be located on both sides of the railway bridge, aligned to face the eastbound and westbound carriageways on the M2 Motorway.

Transport for NSW (TfNSW), formerly Roads and Maritime Services, requires a signage safety assessment to be completed for the proposed signage.

The Transport Planning Partnership (TTPP) has been commissioned by Ethos Urban, on behalf of Sydney Trains, to undertake a signage safety assessment. This assessment has been carried out in accordance with Department of Planning and Environment's *Transport Corridor Outdoor Advertising and Signage Guidelines*, November 2017 (Guidelines) and State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64). The Guidelines outline best practice for the planning and design of outdoor advertisements in transport corridors. The SEPP 64 sets out rules regarding outdoor advertising signage for permissible locations and exempt developments.

1.2 Purpose of this Report

The aim of this assessment is to determine the suitability of the digital signage and provide recommendations on mitigation measures to alleviate impacts on the M2 Motorway corridor. This report sets out the findings of TTPP's signage safety assessment for the proposed digital signage above the M2 Motorway in Epping.

The following items have been considered in this report:

- Potential for the signage to obstruct or distract a driver's view of the road, traffic control devices, and merge/diverge points at entry and exit ramps.
- Distance from upstream or downstream decision points such as merge and diverge points.
- Potential for the signage to distract at a critical or for an extended period of time.
- Location relative to the carriageway and its potential to be a physical obstruction for vehicles or other road users.
- Appropriate dwell times based on the speed environment.
- Location in relation to other signage.

1.3 References

In preparing this report, reference has been made to the following:

- An inspection of the signage location from a driving viewpoint along the M2 Motorway carried out on Friday 13 November 2020.
- Austroads Guide to Road Design Part 3, Geometric Design, 2016.
- Transport Corridor Outdoor Advertising and Signage Guidelines, November 2017 by Department of Planning and Environment.
- State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64).
- Design plans of the proposed digital signage dated 29 September 2020.

2 Proposal Description

2.1 Location Details

A new digital signage is proposed to be installed off the side of the overhead railway bridge across the M2 Motorway in Epping. The railway bridge is used by trains travelling on the T9 Northern Line between Epping station and Cheltenham station.

The proposed digital sign boards will be situated on the eastern and western facades of the railway bridge. Currently, there are no sign boards placed on the railway bridge.

In the vicinity of the proposed signage location, the M2 Motorway has three travel lanes in each of the eastbound and westbound directions. In addition, the on-ramp and off-ramp to Beecroft Road is located near the railway bridge.

An aerial image of the signage location and surrounding environs are shown in Figure 2.1.

Figure 2.1: Signage Location

Map Source: Nearmap aerial imagery dated 26 September 2020

2.2 Description of Proposed Signage

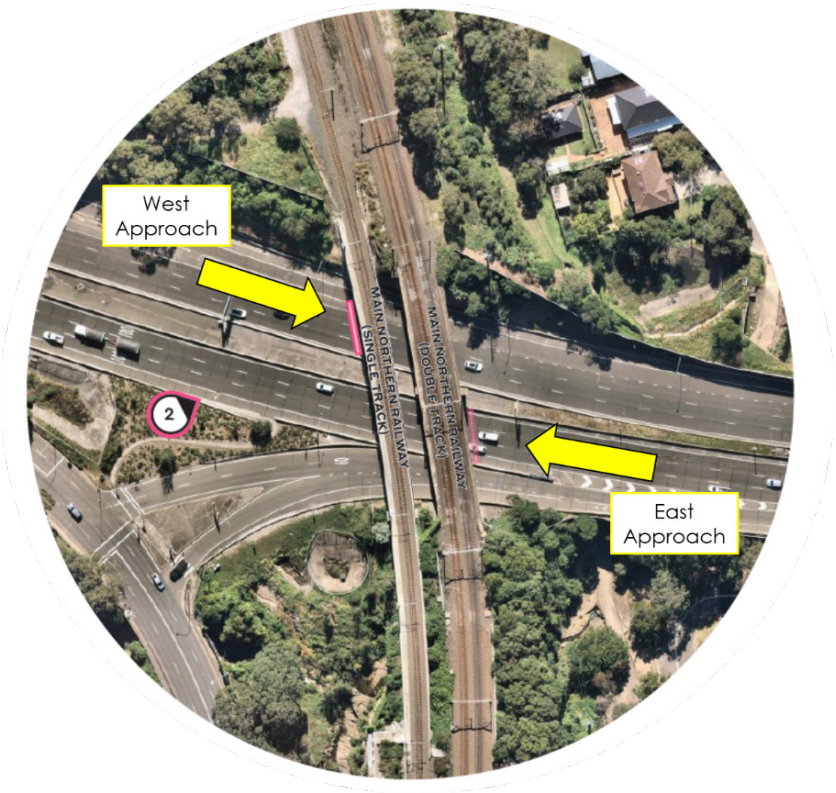
Each signage board will have a length of 15.5m and height of 3.3m, and a visual screen with a length of 12.4m and height of 3.2m (39.7m^2 area). The screen would be set upon a black cladding which will visually appear as a plain border around the visual screen. The base of the signage board will be 5500mm above the road.

The digital signage with LED panel will be installed on both sides of the railway bridge which face the eastbound and westbound travel lanes on M2 Motorway. The proposed digital signage will be used for promoting Sydney Trains and its sponsors, and third-party advertising. The digital signage will contain text and images.

2.3 Signage Exposure

The proposed digital signage would be visible to traffic travelling on the M2 Motorway on the east approach and west approach, as shown in Figure 2.2. A site visit was undertaken on Friday 13 November 2020 to inspect driver sight distances on both approaches to the proposed signage location and observe any potential crash hazards likely to result from the proposed digital signage. A description of the site investigation findings is provided herein.

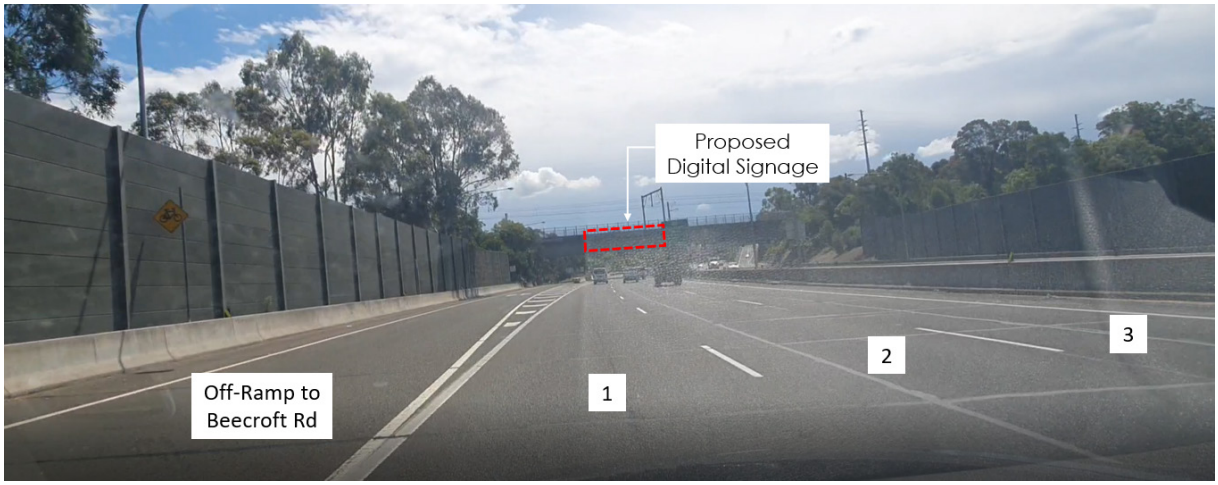
Figure 2.2: M2 Motorway Approaches



2.3.1 M2 Motorway East Approach

The lane configuration on the M2 Motorway east approach in the vicinity of the proposed signage location is shown in Figure 2.3. Travel lanes are numbered from 1 to 3 starting from the travel lane adjacent to the exit off-ramp lane to Beecroft Road.

Figure 2.3: M2 Motorway East Approach Lane Configuration



Source: Photograph taken by TTPP on 13/11/2020

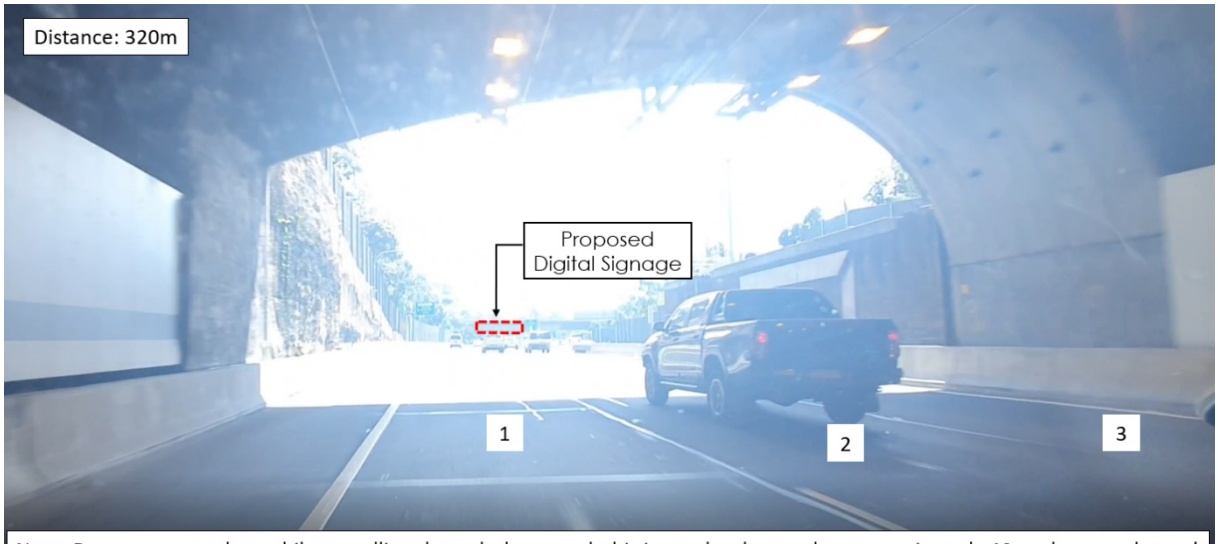
- The east facing digital signage would be visible to motorists on M2 Motorway travelling westbound.
- The digital signage would likely be visible in traffic lanes as follows:
  - In Lane 1 (through lane), 320 m from the sign on the east approach.
  - In Lane 2 (through lane), 320 m from the sign on the east approach.
  - In Lane 3 (through lane), 280 m from the sign on the east approach.
  - In the off-ramp lane to Beecroft Road, 240m from the sign on the east approach. However, the sign would be visible prior to changing lanes from Lane 1.
- In all lanes, the digital signage would become out of driving view approximately 10m south of the proposed signage.

Figure 2.4 shows the perspective of the designer's impression of the concept design at the proposed signage location. Likely visible distances on the M2 Motorway east approach are shown in Figure 2.5 to Figure 2.8.

Figure 2.4: Designer's Impression on East Approach

Source: Ethos Urban Pty Ltd dated 29/09/20

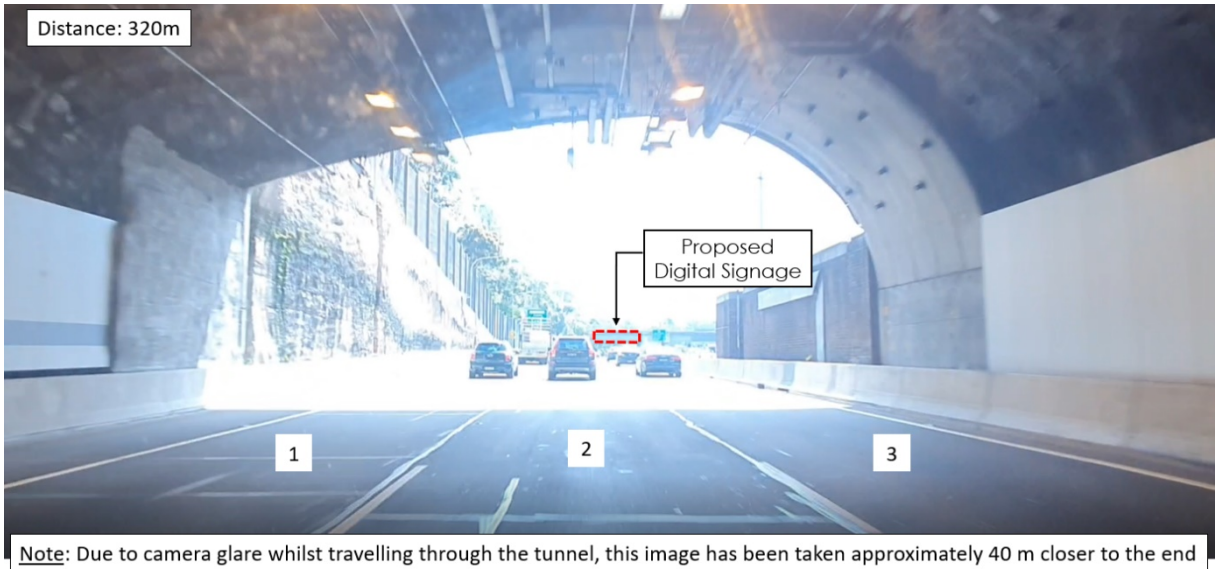
Figure 2.5: East Approach Signage Exposure – Lane 1



Note: Due to camera glare whilst travelling through the tunnel, this image has been taken approximately 40 m closer to the end of the tunnel i.e. 40m closer to the signage location.

Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.6: East Approach Signage Exposure – Lane 2

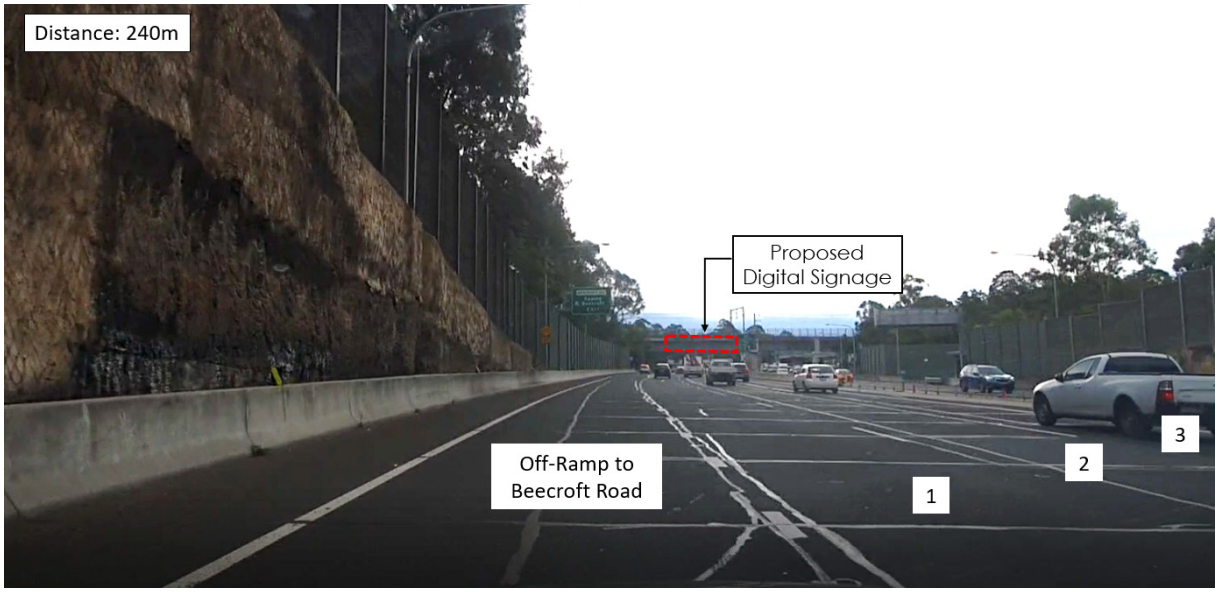


Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.7: East Approach Signage Exposure – Lane 3

Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.8: East Approach Signage Exposure – Off-Ramp to Beecroft Road



Source: Photograph taken by TTPP dated 13/11/2020

2.3.2 M2 Motorway West Approach

The lane configuration on the M2 Motorway west approach in the vicinity of the proposed signage is shown in Figure 2.9. There are three travel lanes and an on-ramp lane (from Beecroft Road) on approach to the proposed signage location.

Figure 2.9: M2 Motorway West Approach Lane Configuration

Source: Photograph taken by TTPP on 13/11/2020

- The west facing digital signage would be visible to motorists on the M2 Motorway travelling eastbound.
- The digital signage would likely be visible in traffic lanes as follows:
  - In Lane 1 (through lane), 400 m from the sign on the west approach.
  - In Lane 2 (through lane), 380 m from the sign on the west approach.
  - In Lane 3 (through lane), 380 m from the sign on the west approach.
  - In the on-ramp lane from Beecroft Road, 310 m from the sign on the west approach.
- In all lanes, the digital signage would become out of driving view approximately 10m west of the proposed signage.

Figure 2.10 shows the perspective of the designer's impression of the concept design at the proposed signage location. Likely visible distances on the M2 Motorway west approach are shown in Figure 2.11 to Figure 2.14.

Figure 2.10: Designer's Impression on West Approach

Source: Ethos Urban Pty Ltd dated 29/09/20

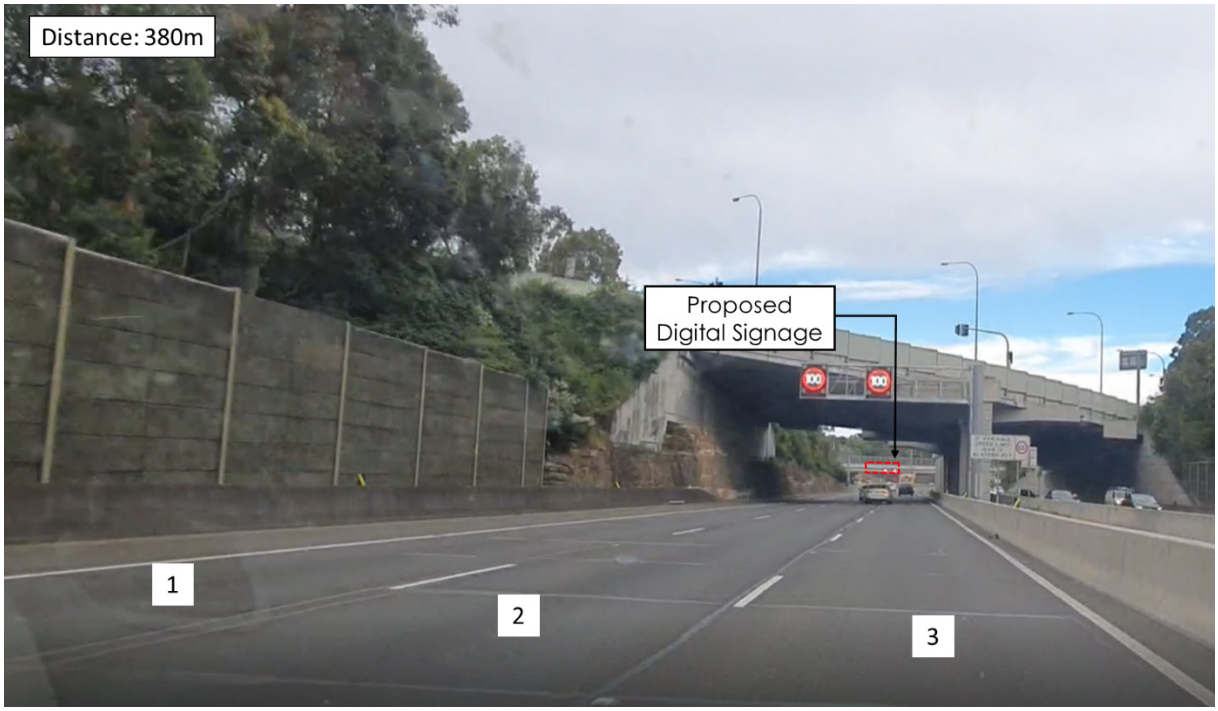
Figure 2.11: West Approach Signage Exposure – Lane 1

Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.12: West Approach Signage Exposure – Lane 2

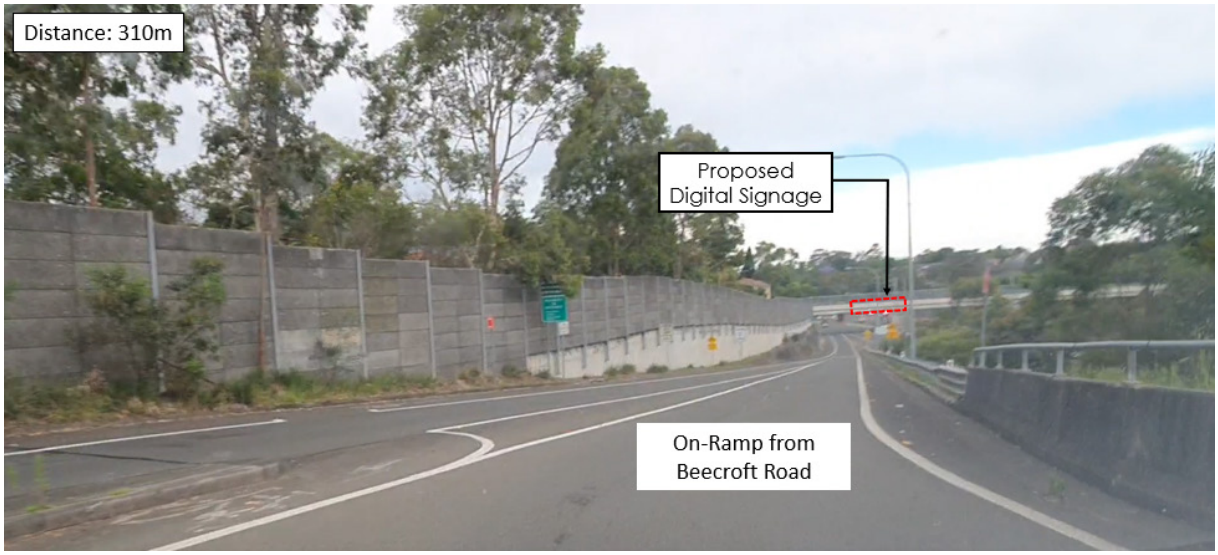
Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.13: West Approach Signage Exposure – Lane 3



Source: Photograph taken by TTPP dated 13/11/2020

Figure 2.14: West Approach Signage Exposure – On-Ramp from Beecroft Road



Source: Photograph taken by TTPP dated 13/11/2020

2.4 Crash History

Historic crash data has been obtained from Transport for NSW (TfNSW) and assessed for incidents on the M2 Motorway within the viewable distance of the proposed signage location. Based on site observations (as detailed in Section 2.3), the proposed signage location is visible from a distance of approximately up to 320m away on the east approach and up to 400m away on the west approach.

Crash history data has been assessed on both approaches to the proposed signage location between 1 January 2015 and 31 December 2019 (5-year finalised data). The location of historical crashes in the vicinity and a description of the incident are shown Figure 2.3.

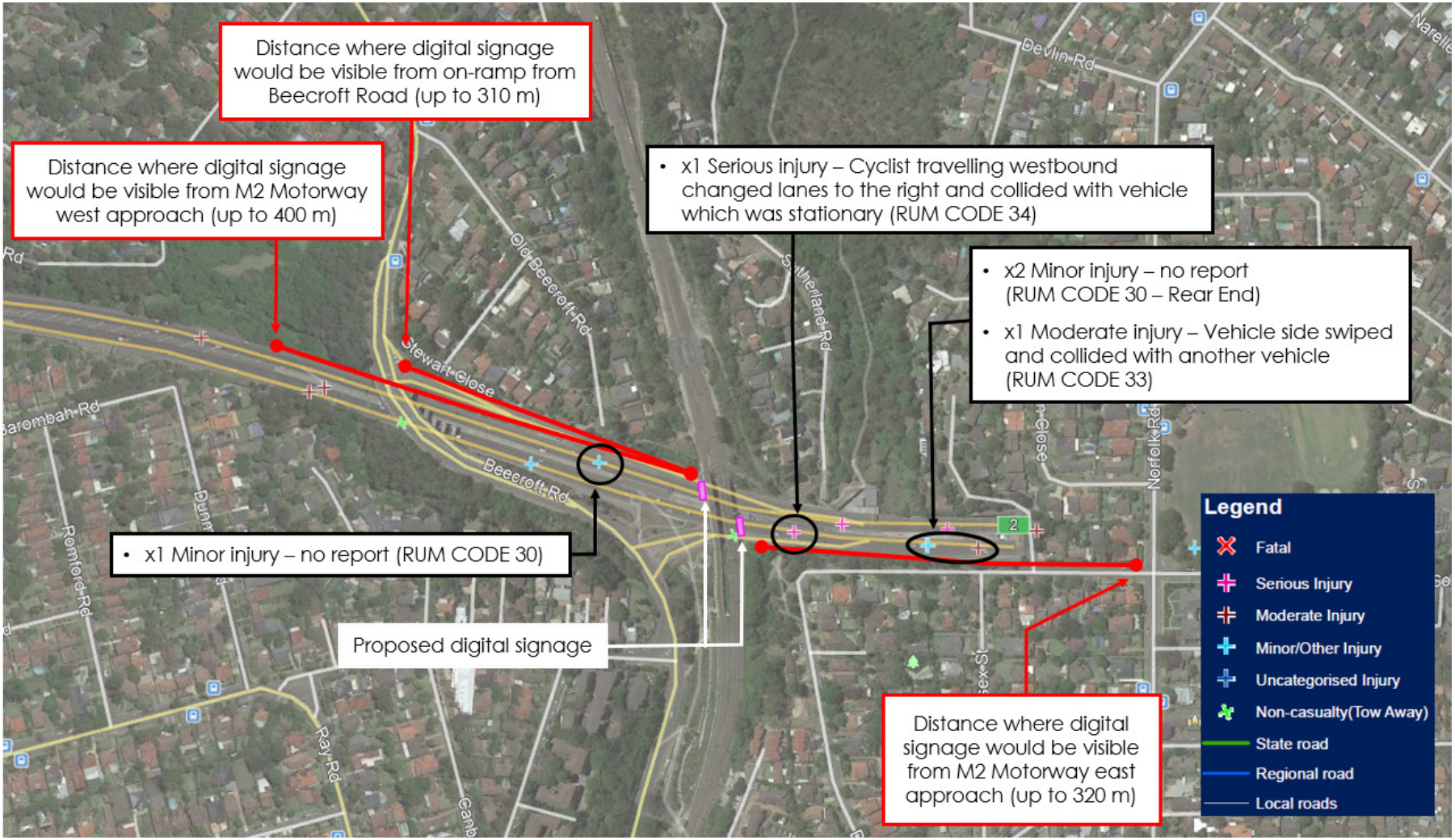
A summary of the crashes in the vicinity of the proposed digital signage is presented in Table 2.1.

Table 2.1: Crash Type and Severity

Location	Crash Type	Crash Severity (No. of Crashes)				
		Fatality	Serious Injury	Moderate Injury	Minor Injury	Non-casualty (tow-away)
Within visible distance of digital signage on M2 Motorway east approach (up to 320 m away from signage)	Rear End (RUM CODE 30)				2	
	Same Lane Side Swipe (RUM CODE 33)			1		
	Lane Change Right (RUM CODE 34)		1			
	Sub-total		**1**	**1**	**2**	
Within visible distance of digital signage on M2 Motorway west approach (up to 400 m away from signage) -	Rear End (RUM CODE 30)				1	
	Sub-total	**0**	**0**	**0**	**1**	**0**

Source: Transport for NSW

Figure 2.15: Crash Locations in Recent 5-Year Period



Source: Transport for NSW

Four incidents were recorded in westbound direction (320 m visible distance) and one incident was recorded in the eastbound direction (400 m visible distance). Of these five accounts, one crash resulted in a serious injury while the remaining incidents were classified as moderate injury or minor injury.

The most common incident to occur in the vicinity of the proposed signage is a rear end crash type (RUM CODE 30) i.e. three out of five crashes. The crash which resulted in a serious injury was classified as a lane change right (RUM CODE 34), and involved a cyclist and a vehicle.

3 Statutory Requirements

This section of the report assesses the compliance with the road safety assessment criteria established in the Guidelines and SEPP 64 requires analysis as to whether the proposal will reduce the safety of:

- Any public roads
- Pedestrians and cyclists
- Pedestrians by obscuring sight lines from public areas.

The proposed design has been assessed against the relevant statutory requirements and guidelines. In order to assess any new installation against the above key road safety assessment criteria, a series of detailed criteria are set out in Section 3, *Advertisements and Road Safety* of the Guidelines.

3.1 Sign Location Criteria

3.1.1 Road Clearance

(a) The advertisement must not create a physical obstruction or hazard. For example:

i. Does the sign obstruct the movement of pedestrians or bicycle riders? (e.g. telephone kiosks and other street furniture along roads and footpath areas).

ii. Does the sign protrude below a bridge or other structure so it could be hit by trucks or other tall vehicles? Will the clearance between the road surface and the bottom of the sign meet appropriate road standards for that particular road?

iii. Does the sign protrude laterally into the transport corridor so it could be hit by trucks or wide vehicles?

The digital signage will not physically obstruct any vehicle, pedestrian and cyclist movements as it will be placed on the side of the railway bridge above the M2 Motorway. The digital signage will not protrude below the underside of the railway bridge, and hence the vertical clearance will be maintained as per existing conditions.

The concept design for the signage and its positioning on the sides of the railway bridge are shown in Appendix A.

(b) Where the sign supports are not frangible (breakable), the sign must be placed outside the clear zone in an acceptable location in accordance with Austroads Guide to Road Design (and RMS supplement) or behind an RMS-approved crash barrier.

The digital sign boards will be installed on both sides of the railway bridge which is positioned above the M2 Motorway carriageway and outside of the clear zone. Hence, it would not require an RMS-approved crash barrier.

(c) Where a sign is proposed within the clear zone but behind an existing RMS-approved crash barrier, all its structures up to 5.8m in height (relative to the road level) are to comply with any applicable lateral clearances specified by Austroads Guide to Road Design (and RMS supplements) with respect to dynamic deflection and working width.

The digital sign boards will not be located within the clear zone.

A minimum vertical clearance of 5 m will be maintained as per the existing conditions.

(d) All signs that are permitted to hang over roads or footpaths should meet wind loading requirements as specified in AS1170.1 and AS 1170.2. All vertical clearances as specified above are regarded as being the height of the sign when under maximum vertical deflection.

As part of the detailed design phase, the proposed signage will be designed in accordance with Australian Standards AS1170.1 and AS1170.2 to meet the requirements for wind loading, whilst having consideration for height of the sign boards when under maximum vertical deflection.

3.1.2 Line of Sight

(a) An advertisement must not obstruct the drivers view of the road particularly of other vehicles, bicycle riders or pedestrians at crossings.

The digital signage will be positioned at the height of the railway bridge, not impeding the motorists' visibility of the road alignment. The digital signage would not protrude below the underside of the railway bridge, and hence would not be obstructing visibility to any vehicles and cyclists on the M2 Motorway.

(b) An advertisement must not obstruct a pedestrian or cyclist's view of the road.

The proposed digital signage will not obstruct cyclist's view of the road. Pedestrian access along the M2 Motorway is prohibited.

(c) The advertisement should not be located in a position that has the potential to give incorrect information on the alignment of the road. In this context, the location and arrangement of signs' structures should not give visual clues to the driver suggesting that the road alignment is different to the actual alignment. An accurate photo-montage should be used to assess this issue.

The proposed digital signage will be positioned at the same height as the railway bridge which would not impede a driver's visibility on the alignment of the road. The digital signage would not indicate misleading information or information contrary to the existing roadway. This is supported by the designer's impression of the proposed signage as depicted in Figure 2.4 and Figure 2.10.

(d) The advertisement should not distract a driver's attention away from the road environment for an extended length of time. For example:

- ***(i) The sign should not be located in such a way that the driver's head is required to turn away from the road and the components of the traffic stream in order to view its display and/or message. All drivers should still be able to see the road when viewing the sign, as well as the main components of the traffic stream in peripheral view.***
- ***(ii) The sign should be oriented in a manner that does not create headlight reflection in the driver's line of sight. As a guideline, angling a sign five degrees away from right angles to the driver's line of sight can minimise headline reflections. On a curved road alignment, this should be checked for the distance measured back from the sign that a car would travel in 2.5 seconds at the design speed.***

The proposed digital signage would be located within a driver's line of sight for both eastbound and westbound movements on the M2 Motorway with visible distances of up to 400 m and up to 320 m, respectively. In addition, the digital signage would be placed above the road therefore, a driver would not be required to turn away from the road in order to view the digital signage.

3.1.3 Proximity to Decision Making Points and Conflict Points

(a) A sign should not be located:

- ***(i) Less than the safe sight distance from an intersection, merge points, exit ramp, traffic control signal or sharp curves.***

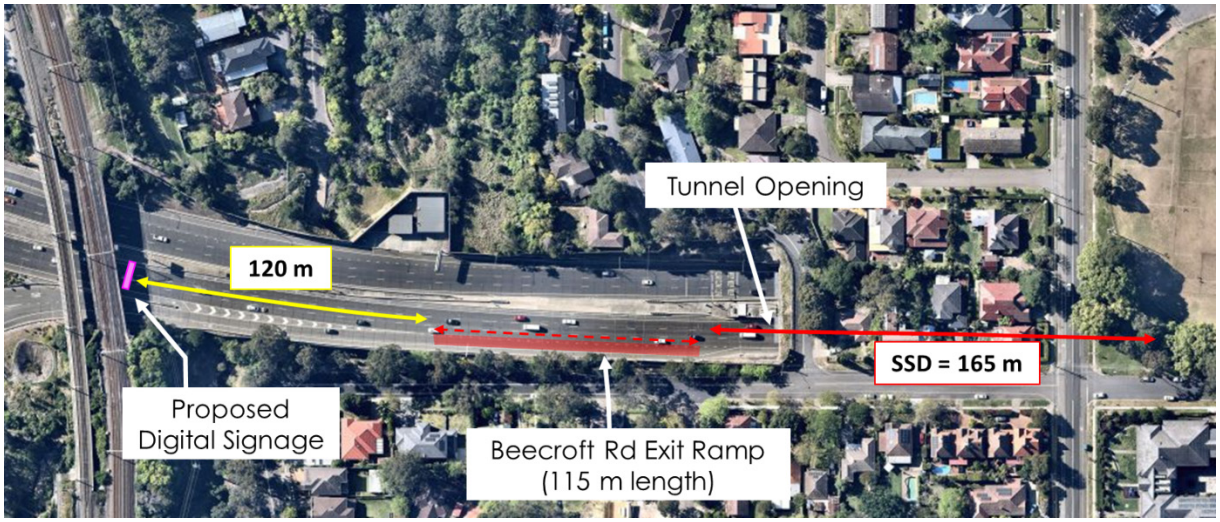
The existing diverge point/ exit ramp for Beecroft Road is 115 m in length; the western end of the diverge would be located 120 m in front of the digital signage. The proposed digital signage would be located beyond the exit ramp, and thus, would not be situated within the safe sight distance. This arrangement is shown in Figure 3.1.

As per Austroads Guide to Road Design Part 4A, the minimum Stopping Sight Distance (SSD) refers to the distance to enable a normally alert driver, travelling at the operating speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead. This distance is dependent on the operating (85th percentile) speed of the road, road gradient and other road characteristics.

For the purpose of this assessment, an operating speed of 100 km/h has been used to calculate the minimum SSD. According to Austroads, the minimum safe stopping sight distance for a 100 km/h speed zone is 165 m.

As per the criteria, the digital advertising sign will not be located within the SSD from the Beecroft Road off-ramp, as shown in Figure 3.1.

Figure 3.1: Off-Ramp Exit to Beecroft Road



Map Source: Nearmap

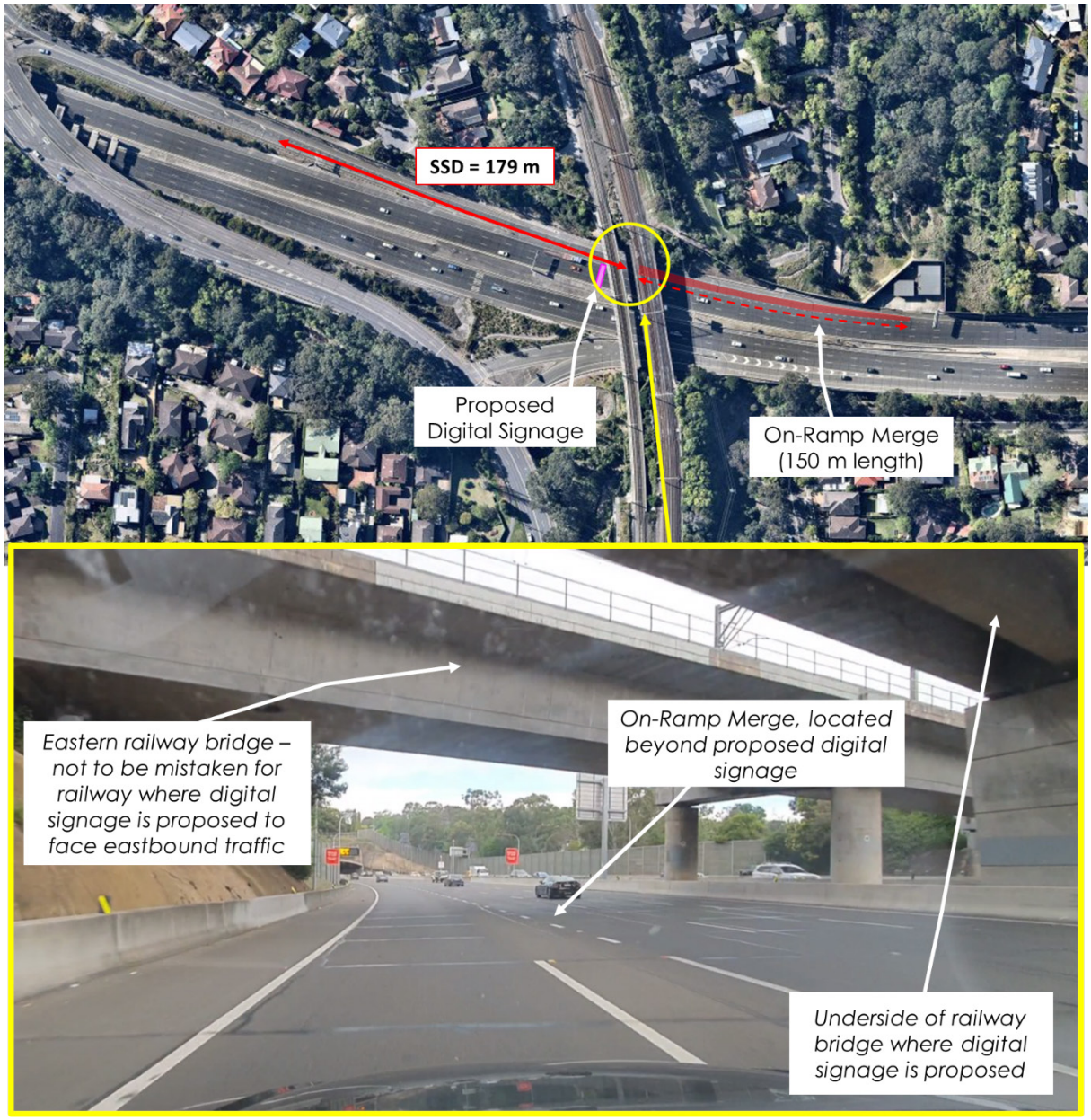
The existing merge point for the on-ramp (from Beecroft Road) is approximately 150 m in length. Notably, the beginning of the merge point is located beneath the railway bridge and beyond the visible distance of the digital signage, as shown in Figure 3.2.

The on-ramp has a variable speed limit with a typical posted speed limit of 100 km/h. Also, the on-ramp has a downward slope towards the M2 motorway road level. The average decline has been measured off Nearmap at approximately 3.6%. Where there is a slope on the approach, the Austroads Guidelines specifies a grade correction factor be applied. In this case, a correction of 14 m is added to the 165 m minimum SSD. Thus, the SSD towards the beginning of the merge point would be 179 m as shown in Figure 3.2.

As described in Section 2.3.2, the digital signage would be visible for a distance of 310 m on approach whilst travelling along the on-ramp. Therefore, a driver will have a long exposure time on approach to the digital signage. The point where a driver can merge from the on-ramp lane to Lane 1 is located beneath the railway bridge upon which the digital signage is proposed to be installed. At this point, a driver's attention will not be focused on the signage since it will be out-of-view for the driver; rather, the driver's attention would be focused on the merge point that is ahead as shown in Figure 3.2.

Based on the above, the proposed signage would not be expected to affect road safety as a result of its location.

Figure 3.2: Off-Ramp Entry from Beecroft Road



Map Source: Nearmap. Photograph taken by TTPP dated 13/11/2020

(ii) Less than the safe stopping sight distance from a marked foot crossing, pedestrian crossing, pedestrian refuge, cycle crossing, cycleway facility or hazard within the road environment.

An existing cycle crossing point is located on the M2 Motorway on-ramp from Beecroft Road. As observed on-site, there is currently no advisory signage for riders however, Google Street View imagery from September 2020 shows that previously such advisory signage did exist. The advisory signage from Google Street View is shown in Figure 3.3. At this location, a cyclist is

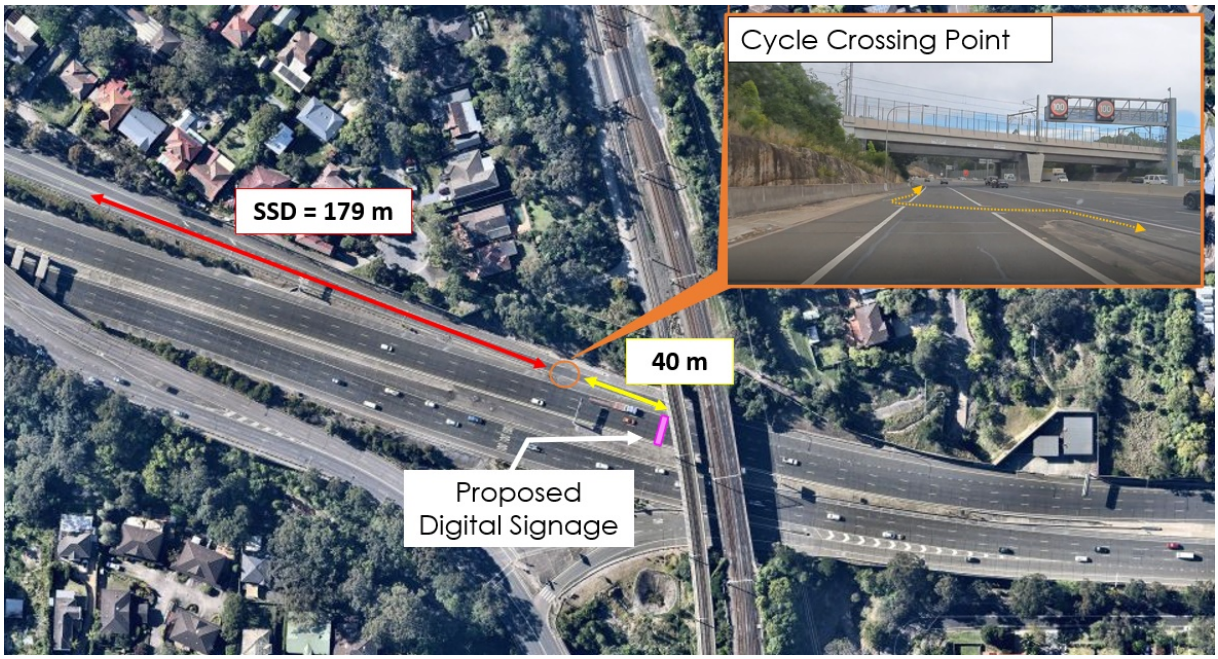
required to give-way to traffic and cross once there is a suitable gap to safely cross the road. As such, vehicles travelling along the on-ramp have priority over cyclists.

Notwithstanding this, the minimum Stopping Sight Distance (SSD) on approach to the crossing point is required. The SSD is 179 m at this location. The digital signage location is beyond the cycle crossing point and would not be positioned within the minimum SSD, as shown in Figure 3.4.

Figure 3.3: Cycle Crossing Point Signage

Source: Google Street View, imagery dated September 2020

Figure 3.4: Cycle Crossing Point - On-Ramp from Beecroft Road



Map Source: Nearmap

Similarly, there is an existing cycle crossing point located on the off-ramp to Beecroft Road. The off-ramp has a posted speed limit of 60 km/h and a flat grade on approach to the cycle crossing point. The minimum SSD in a 60 km/h speed zone is 64 m. As shown in Figure 3.5, a minimum SSD of 64m extends beyond the posted 60 km/h area (as shown by the "60" pavement line marking). Therefore, to be conservative, an SSD for the prior speed zone (100 km/h) has been adopted to calculate the SSD. On this basis, the minimum SSD on approach to the cycle crossing point is 165 m. The proposed digital signage is located outside the minimum SSD as shown in Figure 3.5.

Figure 3.5: Cycle Crossing Point – Off-Ramp to Beecroft Road

Map Source: Nearmap

(iii) So that it is visible from the stem of a T-intersection.

There are no T-intersections in the vicinity of the proposed digital signage.

(b) The placement of a sign should not distract a driver at a critical time. In particular, signs should not obstruct a driver's view:

(i) Of a road hazard,

(ii) To an intersection,

(iii) To a prescribed traffic control device (such as traffic signals, stop or give way signs or warning signs)

(iv) To an emergency vehicle access point or Type 2 driveways (wider than 6-9 metres) or higher.

A "critical time" is understood to refer to a point in time when a driver decision is required, implying that a road safety implication could occur if a driver was distracted at this time.

The proposed digital signage on the east approach would be positioned on the existing railway bridge. An interchange sequence sign is located in the M2 Motorway median

adjacent to the proposed digital signage, as shown in Figure 3.6. For motorists travelling westbound on the M2 Motorway, the digital signage would not obstruct a driver's view of the interchange sequence sign.

Figure 3.6: Driving View of Existing Signage on East Approach

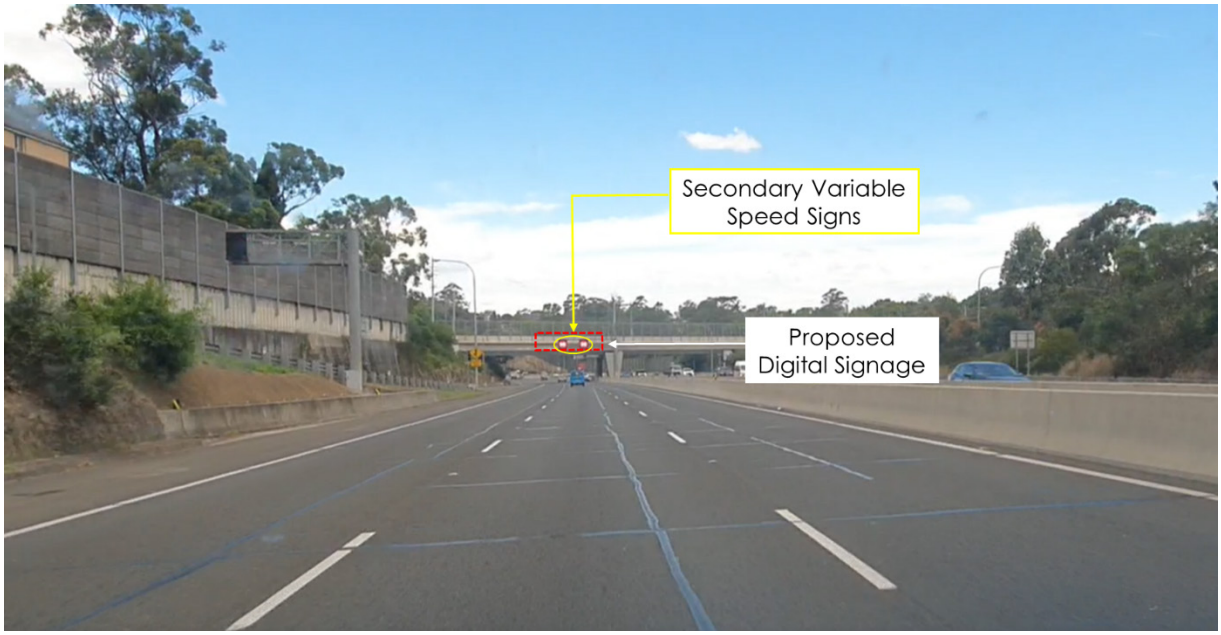
Source: Photograph taken by TTPP dated 13/11/2020

On the west approach, the digital signage will be positioned on the railway bridge above the roadway and the primary variable speed limit signs as shown in Figure 3.7. The digital signage is positioned behind the secondary variable speed limit signs as shown in Figure 3.8.

Figure 3.7: Driving View of Primary Variable Speed Sign on West Approach

Source: Photograph taken by TTPP dated 13/11/2020

Figure 3.8: Driving View of Secondary Variable Speed Sign on West Approach



Source: Photograph taken by TTPP dated 13/11/2020

Three vertical clearance signs are located on the railway bridge from the west approach. Two vertical clearance signs will be relocated directly below the digital advertising sign, as shown in Figure 2.10.

3.1.4 Sign Spacing

(a) Sign spacing should limit drivers view to a single sign at any given time with a distance of no less than 150m between signs in any one corridor. Exemptions for low speed, high pedestrian zones or CBD zones will be assessed by RMS as part of their concurrence role.

There are no other digital signs or static billboards placed within 150m of the proposed signage in both directions.

3.2 Sign Design and Operation Criteria

3.2.1 Advertising Signage and Traffic Control Devices

(a) The advertisement must not distract a driver from, obstruct or reduce the visibility and effectiveness of directional signs, traffic signals, prescribed traffic control devices, regulatory signs or advisory signs or obscure information about the road alignment.
(b) The advertisement must not interfere with stopping sight distance for the road's design speed or the effectiveness of a traffic control device. For example:
- ***(i) Could the advertisement be construed as giving instructions to traffic such as 'Stop', 'Halt' or 'Give Way'?***
- ***(ii) Does the advertisement imitate a prescribed traffic control device?***
- ***(iii) If the sign is in the vicinity of traffic lights, does the advertisement use red, amber or green circles, octagons, crosses or triangles or shapes or patterns that may result in the advertisement being mistaken for a traffic signal?***

Details of the advertisement/s are not yet known since the project is still within the concept design stage. However, based on the example advertisements as depicted in the designer's impression (Figure 2.4 and Figure 2.10), the signage would not display colours and shapes which could be mistaken for a traffic signals or traffic control devices.

Notwithstanding this, it is recommended that the content of the proposed signage be reviewed against Table 5 of the Guidelines to avoid any content that may be construed as imitating a traffic control device.

3.2.2 Dwell Time and Transition Time

(a) Each advertisement must be displayed in a completely static manner, without any motion, for the approved dwell time as per criterion (b) below
(b) Dwell times for image display must not be less than:
- ***(i) 10 seconds for areas where the speed limit is below 80km/h***
- ***(ii) 25 seconds for areas where the speed limit is 80km/h and over.***

(c) Any digital sign that is within 250 metres of a classified road and is visible from a school zone must be switched to a fixed display during school zone hours.

(d) Digital signs must not contain animated or video/movie style advertising or messages of image failure, the default image must be a black screen.
(e) The transition time between messages must be no longer than 0.1 seconds, as in the event of image failure, the default image must be a black screen.

The digital signage is proposed to contain text and images. Based on the Guidelines, the minimum dwell time for content displayed on the digital signage would be 25 seconds.

The proposed digital signage is not located near a school zone.

3.2.3 Illumination and Reflectance

(a) Luminance levels must comply with the requirements in Table 6 in Transport Corridor Outdoor Advertising and Signage Guidelines
(b) The image displayed on the sign must not otherwise unreasonably dazzle or distract drivers without limitation to their colouring or contain flickering or flashing content.

Section 3.3.3 of the Guidelines details assessment criteria to ensure that illumination and reflectance qualities of signage do not cause a road safety hazard. It is understood that these criteria would be addressed in a separate specialist report prepared by a qualified consultant.

3.2.4 Interaction and Sequencing

(a) The advertisement must no incorporate technology which interacts with in-vehicle electronic devices or mobile devices. This includes interactive technology or technology that enables opt-in direction communication with road users.
(b) Message sequencing designed to make a driver anticipated the next message is prohibited across images presented on a single sign and across a series of signs.

The proposed signage would not contain interactive technology or technology that enables opt-in direction communication with motorists. The digital signage would not be designed to make motorists anticipate information.

3.3 Digital Signs

Transport Corridor Advertising Signage Guidelines specify criteria which are directly applicable to the assessment of digital signs. The criteria have been assessed in Table 3.1.

It is noted that most of the criteria are related to signage content and would need to be addressed by the operator. In addition, these criteria should be included as part of the consent conditions for the proposal to ensure future compliance.

Table 3.1: Digital Signs

	Criteria	Comments
A	*Each advertisement must be displayed in a completely static manner, without any motion, for the approved dwell time as per criterion (d) below.*	Relates to sign content only.
B	*Message sequencing designed to make a driver anticipate the next message is prohibited across images presented on a sign and across a series of signs.*	Relates to sign content only.
C	*The image must not be capable of being mistaken:* *i. for a prescribed traffic control device because it has, for example, red, amber or green circles, octagons, crosses or triangles or shapes or patterns that may result in the advertisement being mistaken for a prescribed traffic control device, or* *ii. as text providing driving instructions to drivers.*	Relates to sign content only.
D	*Dwell times for image display are:* *i. 10 seconds for areas where the speed limit is below 80 km/h.* *ii. 25 seconds for areas where the speed limit is 80 km/h and over.*	A dwell time of 25 seconds would be suitable for the proposed digital signage.
E	*The transition time between messages must be no longer than 0.1seconds, and in the event of image failure, the default image must be a black screen.*	An almost instantaneous transition is likely to reduce the additional distraction potential for digital signs. It is assumed that this operational requirement would be met.
F	*Luminance levels must comply with the requirements in Section 3 (Transport Corridor Advertising Signage Guidelines).*	This signage would be classified as Zone 4, with maximum illuminance levels of: i. Day Time – 6,000 cd/sqm ii. Morning/ Evening – 500 cd/sqm iii. Night Time – 200 cd/sqm The signage would be classified as Zone 4 given that the location is primarily surrounded by residential dwellings.
G	*The images displayed on the sign must not otherwise unreasonably dazzle or distract drivers without limitation to their colouring or contain flickering or flashing content.*	It is assumed that this operational requirement would be met.
H	*The amount of text and information supplied on a sign should be kept to a minimum (e.g. no more than a driver can read at a short glance).*	Relates to sign content only.
I	*Any signs that is within 250 metres of a classified road and is visible from a school zone must be switched to a fixed display during school zone hours.*	The sign is not visible from within a school zone.
J	*Each sign proposal must be assessed on a case by case basis including replacement of an existing fixed, scrolling or tri-vision sign with a digital sign and in the instance of a sign being visible from each direction, both directions for each location must be assessed on their own merits.*	Noted.
K	*At any time, including where the speed limit in the area of the sign is changed, if detrimental effect is identified on road safety post installation of a digital sign, RMS reserves the right to re-assess the site using an independent RMS-accredited road safety auditor.*	Noted.

	Criteria	Comments
	Any safety issues identified by the auditor and options for rectifying the issues are to be discussed between RMS and the sign owner and operator.	
L	*Sign spacing should limit drivers' view to a single sign at any given time with a distance of no less than 150m between signs in any one corridor. Exemptions for low speed, high pedestrian zones or CBD zones will be assessed by RMS as part of their concurrence role.*	*Noted.*
M	*Signs greater than or equal to 20sqm must obtain RMS concurrence and must ensure the following minimum vertical clearances;* *i. 2.5m from lowest point of the sign above the road surface if located outside the clear zone* *ii. 5.5m from lowest point of the sign above the road surface if located within the clear zone (including shoulders and traffic lanes) or the deflection zone of a safety barrier if a safety barrier is installed.* *If attached to road infrastructure (such as an overpass), the sign must be located so that no portion of the advertising sign is lower than the minimum vertical clearance under the overpass or supporting structure at the corresponding location.*	The proposed digital signage would maintain the same vertical clearance as the existing rail bridge which is 5 m. The vertical clearance signs would be visible beneath the digital advertising signs.
N	*An electronic log of a sign's operational activity must be maintained by the operator for the duration of the development consent and be available to the consent authority and/or RMS to allow a review of the sign's activity in case of a complaint.*	Noted.
O	*A road safety check which focuses on the effects of the placement and operation of all signs over 20sqm must be carried out in accordance with Part 3 of the RMS Guidelines for Road Safety Audit Practices after a 12-month period of operation but within 18 months of the signs installation. The road safety check must be carried out by an independent RMS-accredited road safety auditor who did not contribute to the original application documentation. A copy of the report is to be provided to RMS and any safety concerns identified by the auditor relating to the operation or installation of the sign must be rectified by the applicant. In cases where the applicant is the RMS, the report is to be provided to the Department of Planning and Environment as well.*	Noted.

4 Conclusion

Having consideration for the assessment and discussions presented within this report, the analysis suggests that the installation of a digital signage off the side of the existing railway bridge across the M2 Motorway would be acceptable.

Three vertical clearance signs are located on the railway bridge from the west approach. Two vertical clearance signs will be relocated directly below the digital advertising sign.

This conclusion is made on the basis that the proposed digital signage would not be expected to:

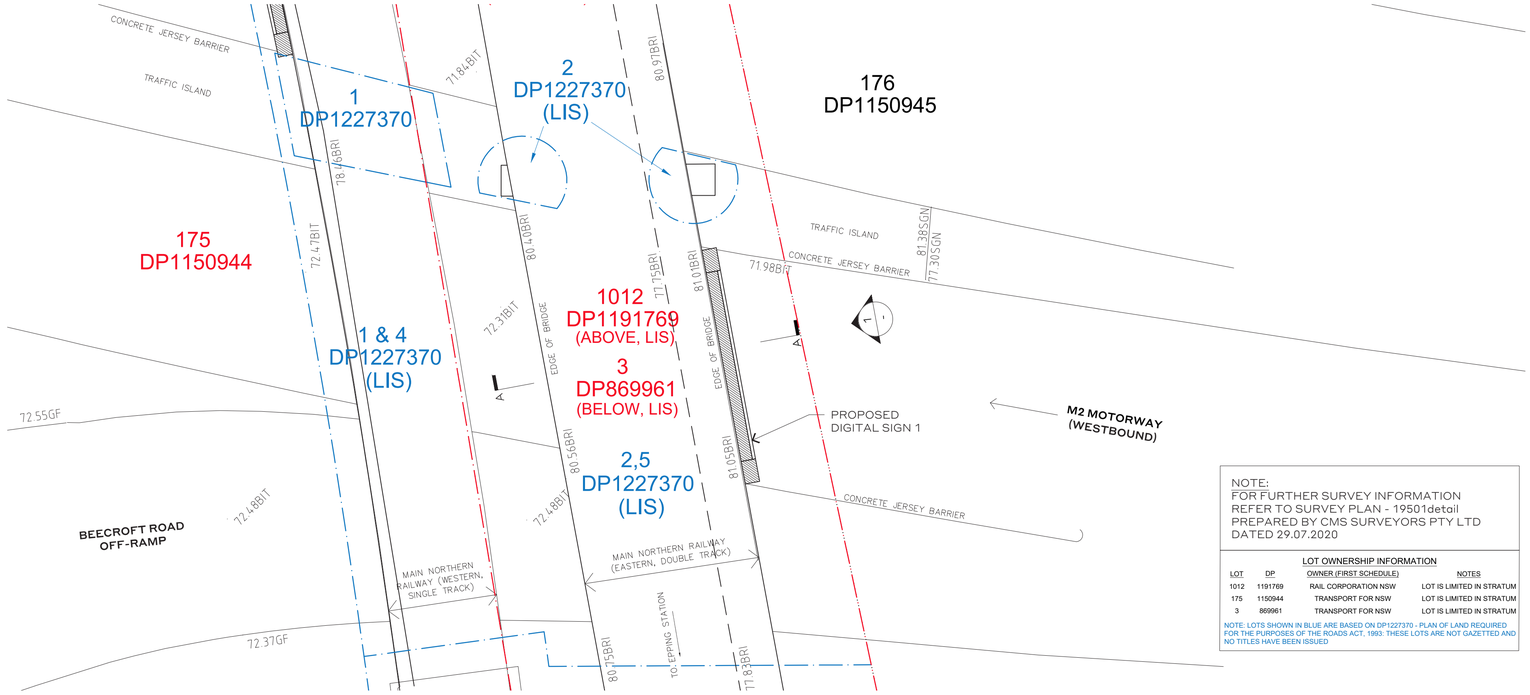
- Obstruct/ reduce visibility of any traffic control devices
- Give incorrect information on the alignment of the road
- Affect road safety at the off-ramp merge and exit points.
- Interfere with a driver's ability to read, interpret and react to information displayed by variable speed limit signs.
- Compromise safety for road users in the vicinity.

Appendix A

Concept Design Plans

LOCATION PLAN - AERIAL PHOTO

NTS



NOTE:
FOR FURTHER SURVEY INFORMATION
REFER TO SURVEY PLAN - 19501detail
PREPARED BY CMS SURVEYORS PTY LTD
DATED 29.07.2020

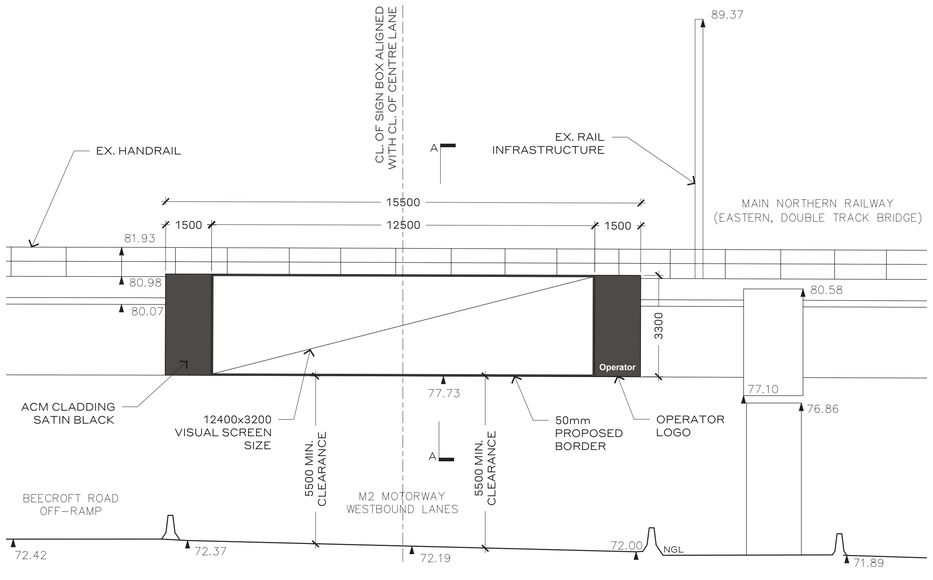
LOT OWNERSHIP INFORMATION

LOT	DP	OWNER (FIRST SCHEDULE)	NOTES
1012	1191769	RAIL CORPORATION NSW	LOT IS LIMITED IN STRATUM
175	1150944	TRANSPORT FOR NSW	LOT IS LIMITED IN STRATUM
3	869961	TRANSPORT FOR NSW	LOT IS LIMITED IN STRATUM

NOTE: LOTS SHOWN IN BLUE ARE BASED ON DP1227370 - PLAN OF LAND REQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993. THESE LOTS ARE NOT GAZETTED AND NO TITLES HAVE BEEN ISSUED

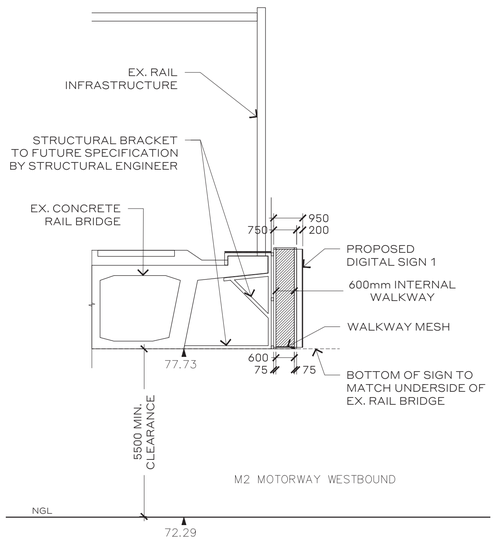
SITE PLAN

SCALE 1:200 @ A1



EAST ELEVATION

SCALE 1:100 @ A1



SECTION A-A

SCALE 1:100 @ A1

PHOTOMONTAGE - VIEW 1

View from Constance Close looking west

NOT FOR CONSTRUCTION

ETHOS URBAN

Ethos Urban Pty. Ltd.
ABN 13 615 087 931 ACN 615 087 931
www.ethosurban.com
173-185 Sussex Street Sydney NSW 2000
t +61 2 9956 6962

LEGEND / NOTES

- Site boundary
- Photomontage location
- Proposed sign (NTS)

ACM Aluminium composite material
LIS Limited in stratum
NGL Natural ground line

ISSUE	DATE	REVISION	REVISION BY	APPROVED BY
A	30.11.20	DA Issue to DPIE	PN	SM

DEVELOPMENT APPLICATION ISSUE TO DPIE

PROJECT

DOOH Development Applications
Prepared for Sydney Trains

SCALE
AS SHOWN @ A1

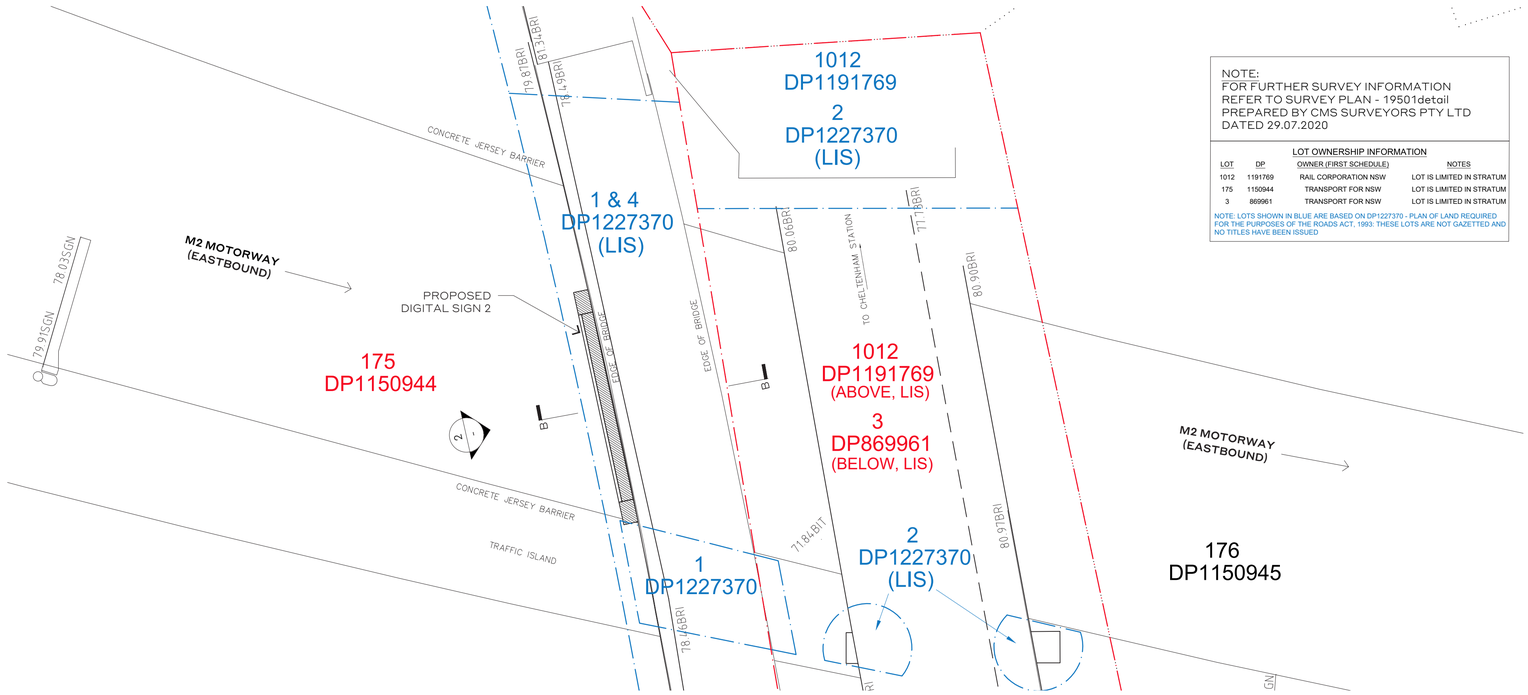
DRAWING

Site Plan & General Arrangement 1 **A-5.1**
Site 5 - Epping M2 (Eastern Side) - Sign 1 /A

JOB NO.	DWG NO.	ISSUE	DATE	DRAWN BY
2200249	A-5.1	A	30.11.20	PN

LOCATION PLAN - AERIAL PHOTO

NTS



NOTE:
FOR FURTHER SURVEY INFORMATION
REFER TO SURVEY PLAN - 19501detail
PREPARED BY CMS SURVEYORS PTY LTD
DATED 29.07.2020

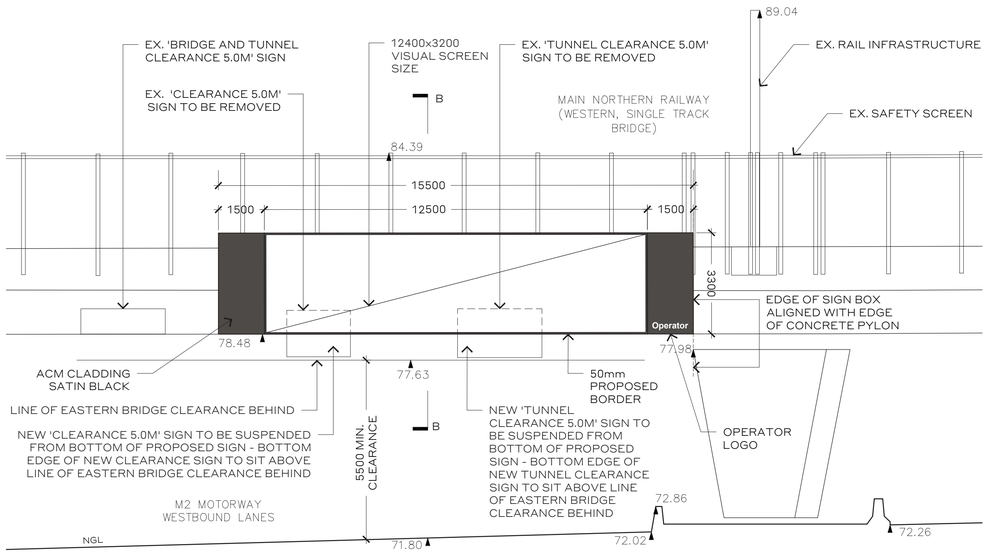
LOT OWNERSHIP INFORMATION

LOT	DP	OWNER (FIRST SCHEDULE)	NOTES
1012	1191769	RAIL CORPORATION NSW	LOT IS LIMITED IN STRATUM
175	1150944	TRANSPORT FOR NSW	LOT IS LIMITED IN STRATUM
3	869961	TRANSPORT FOR NSW	LOT IS LIMITED IN STRATUM

NOTE: LOTS SHOWN IN BLUE ARE BASED ON DP1227370 - PLAN OF LAND REQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993. THESE LOTS ARE NOT GAZETTED AND NO TITLES HAVE BEEN ISSUED

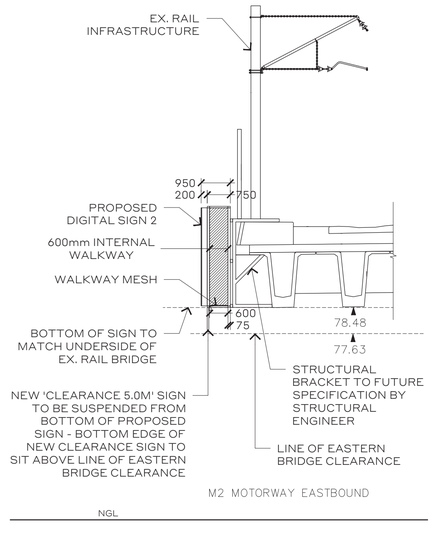
SITE PLAN

SCALE 1:200 @ A1



WEST ELEVATION

SCALE 1:100 @ A1



SECTION B-B

SCALE 1:100 @ A1

PHOTOMONTAGE - VIEW 2

View from M2 looking East

NOT FOR CONSTRUCTION

ETHOS URBAN

Ethos Urban Pty. Ltd.
ABN 13 615 087 931 ACN 615 087 931
www.ethosurban.com
173-185 Sussex Street Sydney NSW 2000
t +61 2 9956 6962

LEGEND / NOTES

- Site boundary
- Photomontage location
- Proposed sign (NTS)

ACM Aluminium composite material
LIS Limited in stratum
NGL Natural ground line

ISSUE	DATE	REVISION	REVISION BY	APPROVED BY
A	30.11.20	DA Issue to DPIE	PN	SM

DEVELOPMENT APPLICATION ISSUE TO DPIE

PROJECT

DOOH Development Applications
Prepared for Sydney Trains

SCALE
AS SHOWN @ A1

DRAWING

Site Plan & General Arrangement 2 **A-5.2**
Site 5 - Epping M2 (Western Side) - Sign 2 /A

JOB NO.	DWG NO.	ISSUE	DATE	DRAWN BY
2200249	A-5.2	A	30.11.20	PN

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au