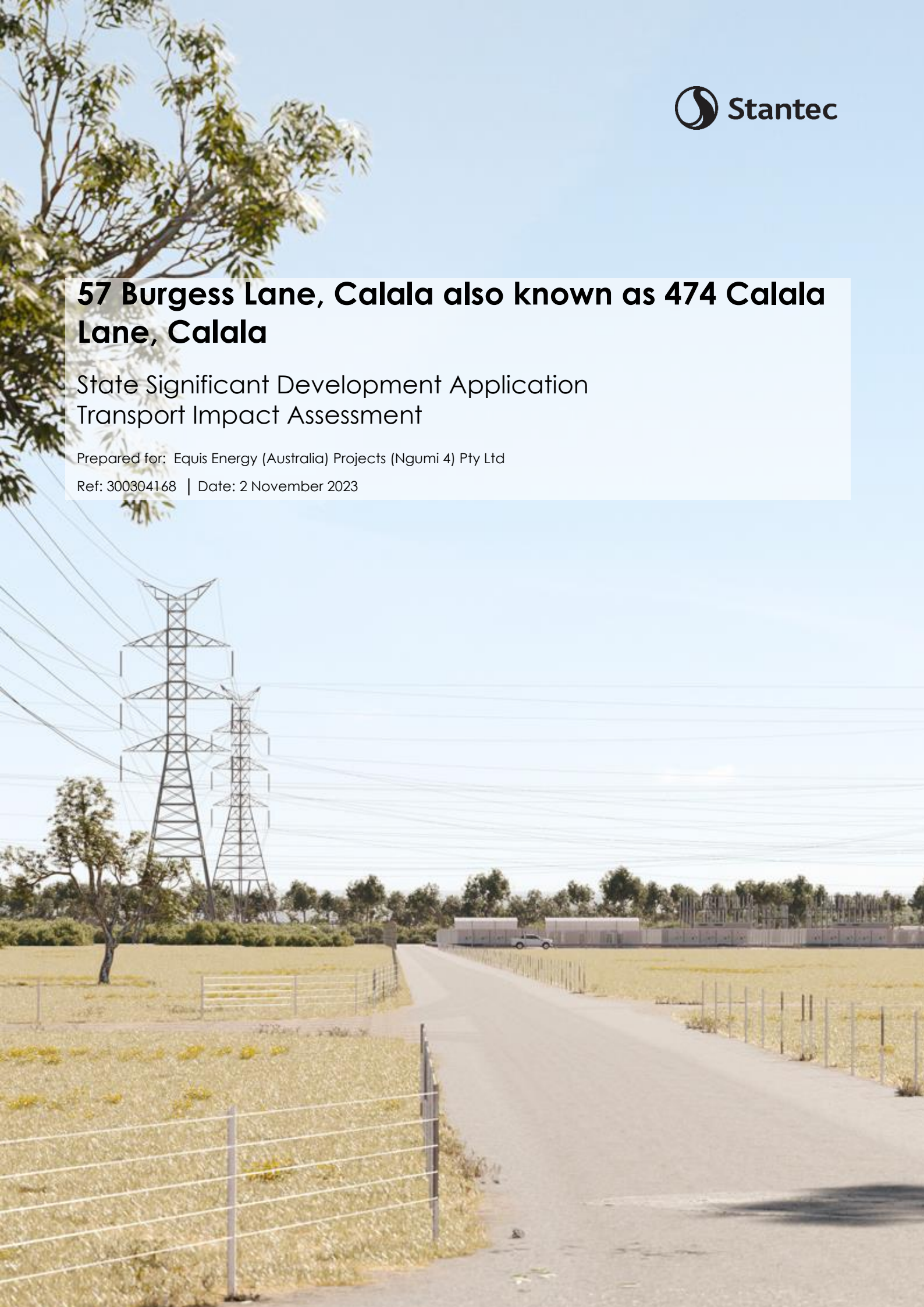
# 57 Burgess Lane, Calala also known as 474 Calala Lane, Calala

## State Significant Development Application
## Transport Impact Assessment

Prepared for: Equis Energy (Australia) Projects (Ngumi 4) Pty Ltd

Ref: 300304168 | Date: 2 November 2023



# Revision

| Revision | Date | Comment | Prepared By | Approved By |
|---|---|---|---|---|
| Final | 3 August 2023 | Final | Helen Aberra, William Xie, Ingrid Bissaker | Brett Maynard |
| Final | 2 November 2023 | Final – updated post consultation with TfNSW | Ingrid Bissaker | Brett Maynard |

**Brett Maynard**

For and on behalf of

**Stantec Australia Pty Ltd**

**L6, Building B, 207 Pacific Highway, St Leonards NSW 2065**

## Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

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# CONTENTS



## 57 Burgess Lane, Calala also known as 474 Calala Lane, Calala

# Appendices

# Executive Summary

Equis Energy (Australia) Projects (NGUMI4) Pty Ltd as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust is seeking approval for the construction and operation of a large-scale Battery Energy Storage System (BESS) located at 57 Burgess Lane, Calala, also known as 474 Calala Lane, Calala. Equis Energy commissioned Stantec to undertake a transport and accessibility impact assessment of the operation and construction of the development to identify the potential impact and any such mitigation measures associated with the proposal.

The proposal will comprise of the following:

- Large-scale BESS including battery enclosures, inverters, DC and AC combiner boxes, transformers and auxiliary components.
- 33/330 kV switchyard
- Underground transmission line connection between the BESS and the nearby TransGrid Tamworth 330 kV substation
- Ancillary elements including site access from Calala Lane, internal access roads and parking, control room and staff amenities, warehouse, stormwater and fire management infrastructure, utilities, signage, fencing, security systems, 4 metre and 5 metre high noise attenuation walls and landscaping.

The site will be operated remotely hence there will be no permanent on-site staff. Maintenance staff in 99$^{th}$ percentile vehicles (cars, vans utes) will be required to occasionally service the facility and hence only a minor quantum of on-site parking is required. The site is expected to generate low traffic volumes of up to one to two vehicles per day. As such, the proposal is not expected to result in any change to traffic conditions in and around the site and the proposal could not be expected to compromise the safety or function of the surrounding road network.

The proposed site access driveway is in a good location with respect to road safety, with Calala Lane sight lines in both directions exceeding all relevant Austroads and Australian Standards (AS2890 series) requirements. Overall, the proposed site access arrangements are considered suitable as part of the proposed development.

The main transport impact of the proposal will be throughout construction.

For much of the construction program, between three to 37 construction workers are expected on site per day. Peak activity is expected to occur over a four-month period with between 68 and 85 workers expected on site per day in any given month. Sufficient dedicated on-site worker car parking will be provided, including formal on-site worker parking for 60 vehicles, with capacity for additional informal worker parking, when necessary.

It is expected that typically, construction vehicle activity will result in 67 vehicles accessing the site per day, comprising around 60 light vehicles and seven trucks. Peak construction is expected to result in up to 465 construction vehicles (one-way) per day, comprising around 85 light vehicles and 380 trucks. A summary of the anticipated increase in traffic in relation to existing traffic data is outlined in Table 1.1.

**Table 1.1 – Anticipated average increase in daily traffic volumes on the surrounding road network**

| Road | Existing daily traffic volumes [1] | Anticipated average increase | |
|---|---|---|---|
| | | Typical average traffic generation (two-way movements) [2] | Peak traffic generation (two-way movements) [2] |
| **Calala Lane** | 3,356 | 134 (4% increase) | 930 (28% increase) |
| **Goonoo Goonoo Road** | 11,364 | 134 (1% increase) | 930 (8% increase) |

[1] Existing traffic volumes discussed in Section 2.2.2
[2] Average vehicles per day multiplied by two to consider two-way trips.

As shown, the additional traffic generated during construction will mostly be minor assessed against existing traffic volumes on Goonoo Goonoo Road. The proportional increase on Calala Lane is expected to be higher given the existing moderate traffic volumes, however the additional traffic is not anticipated to result in significant adverse impacts on the safety or function of the surrounding road network.

Calala Lane currently carries an average of 240 vehicles per hour between 7:00am and 5:00pm on a weekday and a peak hour flow of up to 370 vehicles. During peak construction activities the development could generate an increase of up to 80 vehicles per hour, resulting in a total peak hour volume of about 450 vehicles along Calala Lane. Analysis of mid-block level of service for Calala Lane based on criteria set in Transport for NSW Guide to Traffic Generating Developments 2002 indicates that in the 2025 growth year scenario, Calala Lane would continue to operate at a satisfactory Level of Service C during the peak weekday hour period and Goonoo Goonoo Road will continue to operate with an acceptable Level of Service D where it tapers to one lane in either direction south of Calala Lane. Overall, there

is adequate capacity on the surrounding road network to cater for all construction traffic associated with the proposed development.

The operation of the Calala Lane/ Goonoo Goonoo Road intersection is expected to continue operating well and with spare capacity during both the AM and PM peak hours, during peak construction of the BESS in 2024 or 2025. Four Over Size and Over Mass vehicles (OSOM) will be required for the delivery of components to site. An OSOM route analysis has been completed from Port of Newcastle to the site, indicating an appropriate route is available subject to minor road network mitigations and appropriate traffic management. The route will be subject to further review and finalisation following contractor appointment and subsequent preparation of the Transport Management Plan.

A detailed construction Traffic Management Plan will be completed by the nominated contractor prior to commencement of works, as typically required by development consent conditions. It is critical that the contractor engages with all relevant stakeholders, including the contractors for proposed road works along Goonoo Goonoo Road and near Port of Newcastle, to ensure appropriate coordination of construction activities and to maintain safety for all users of the road network at all times.

# 1. Introduction

## 1.1 Background

This report accompanies a detailed State Significant Development Application that seeks approval for the construction and operation of a large-scale Battery Energy Storage System (BESS) located at 57 Burgess Lane Calala, also known as 474 Calala Lane, Calala.

The BESS footprint site comprises Lot 17 in DP629969, with the underground transmission corridor running from the BESS at Lot 17 in DP629969 and along Lot 16 DP 629969, Lot 3 DP244399 and Lot 4 DP244399, underneath Burgess Lane and connecting substation at Lot 6 DP219993. The total site area (BESS footprint only) is approximately 36 hectares however the footprint of the proposed facility will cover a total area of 8.9 hectares.

The BESS will have a capacity of up to 300 Megawatts (MW) and would provide up to 1200 Megawatt hours (MWh) of battery storage capacity or up to 4 hours of storage duration. The proposal will comprise the following:

- Large-scale BESS including battery enclosures, inverters, DC and AC combiner boxes, transformers and auxiliary components.
- 33/330 kV switchyard
- Underground transmission line connection between the BESS and the nearby TransGrid Tamworth 330 kV substation
- Ancillary elements including site access from Calala Lane, internal access roads and parking, control room and staff amenities, warehouse, stormwater and fire management infrastructure, utilities, signage, fencing, security systems, 4m and 5m high noise attenuation walls and landscaping.

Equis Energy (Australia) Projects (NGUMI4) Pty Ltd as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust commissioned Stantec to undertake a transport and accessibility impact assessment of the operation and construction of the development to identify the potential impact and any mitigation measures for the proposal.

## 1.2 Response to SEARS

The Transport Impact Assessment is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD 52786213. Table 1.1 identifies the SEARs and relevant reference within this report.

**Table 1.1 – SEARS Requirements and Relevant Report References**

| SEARs detail | Report reference |
|---|---|
| • an assessment of the peak and average traffic generation, including over-dimensional vehicles, construction worker transportation and transport of materials by rail; | See Section 5.1, 6, 7 |
| • an assessment of the likely transport impacts to the site access route, site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance; | See Section 5, 6, 7 |
| • a cumulative impact assessment of traffic from nearby developments; and | See Section 6.9, 0 |
| • provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority; | See Section 6, 7 |

## 1.3 Consultation

Stantec consulted with Transport for NSW in October 2023. Meeting minutes and correspondence with Transport is contained in Appendix C.

## 1.4 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic conditions surrounding the site
- service vehicle requirements
- the traffic generating characteristics of the proposed development during operation and construction
- suitability of the proposed access arrangements for the site
- the transport impact of the development proposal on the surrounding road network, including during construction.

## 1.5 References

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

- an inspection of the site and its surrounds
- Tamworth Regional Council Development Control Plan (DCP) 2010
- Australian/New Zealand Standard, Parking Facilities (AS 2890 series)
- traffic surveys undertaken by Northern Transport Planning and Engineering as referenced in the context of this report
- plans for the proposed development prepared by Equis as referenced in the report
- other documents and data as referenced in this report.

# 2. Existing Conditions

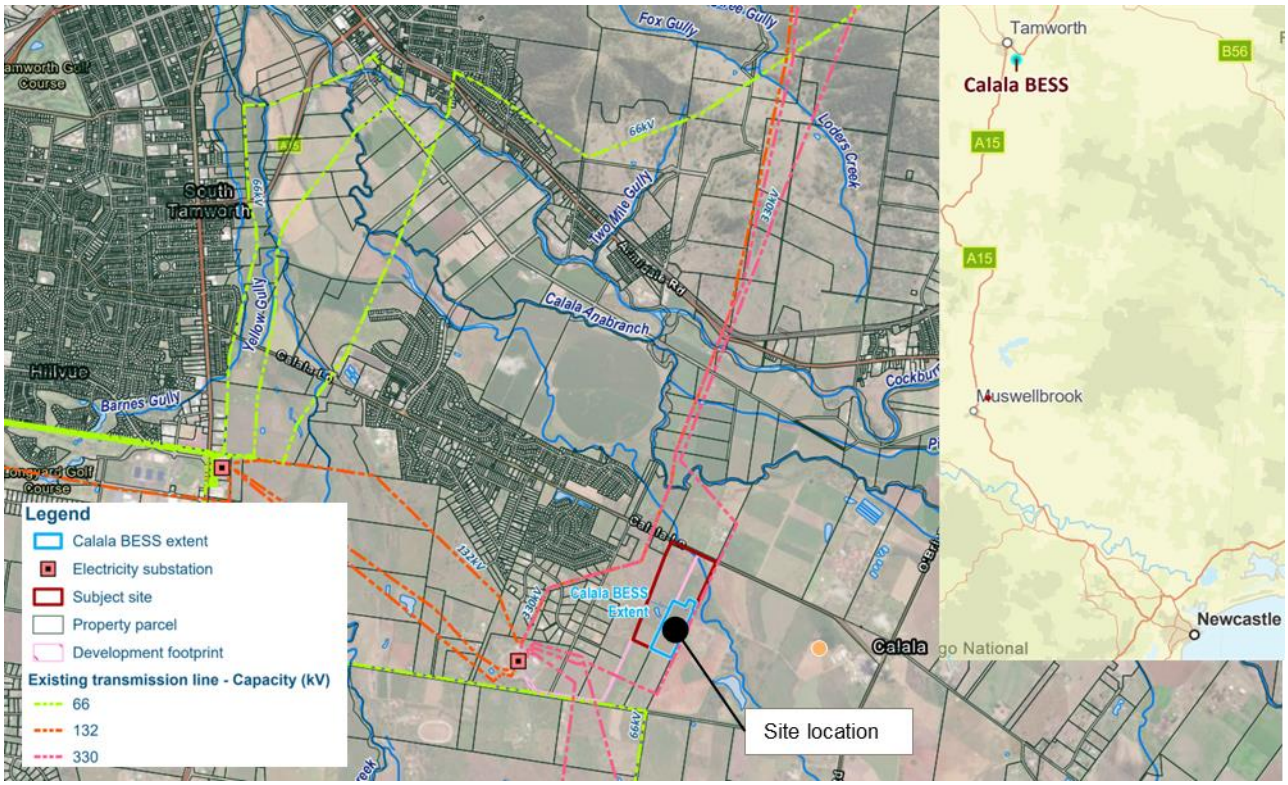
### 2.1.1 Location

The site is at 57 Burgess Lane Calala, also known as 474 Calala Lane, Calala, and identified as Lot 17 DP629969, around five kilometres south-east of South Tamworth and one kilometre from Calala town centre. The site covers 36.24 hectares and has a single site frontage to Calala Lane. It is about one kilometre north-east of the Transgrid Tamworth Substation.

Vehicular access to/ from Tamworth is provided via Calala Lane along the northern boundary of the site. The BESS proposes to relocate the existing access driveway on Calala Lane further east and closer to the eastern site boundary. The site will be operated remotely, and hence without permanent on-site staff, would generate very low traffic volumes as part of daily operations. Minor on-site parking would be provided for use by maintenance vehicles, as required.

The location of the site and its surrounding environs is shown in Figure 2:1.

**Figure 2:1 – Site location and surrounding environs**




Source: Tamworth NSE BESS Regional Context, Equis Energy

## 2.2 Road Network

### 2.2.1 Adjoining Roads

#### Calala Lane

Calala Lane is classified as a Local Road and generally aligned in an east-west direction. Near the site, it is a two-way road configured with one traffic lane in each direction, set within an approximate 10-metre-wide carriageway with unsealed shoulders. Calala Lane has a posted speed limit of 100 kilometres per hour near the site.

#### Goonoo Goonoo Road

Goonoo Goonoo Road is classified as a State Road and aligned in a north-south direction west of the site. It is a two-way road configured with one traffic lane in each direction, set within an approximate 13-metre-wide carriageway. Informal unrestricted kerbside parking is mostly permitted on both sides of the road.

The Australian and NSW Governments are investing $40 million into the Goonoo Goonoo Road (New England Highway) duplication between Jack Smyth Drive and Calala Lane at the southern end of Tamworth. The duplication will address

existing congestion, provide for future traffic growth, and improve road safety. Key features of the proposal as they relate to the site include:

- Calala Lane intersection upgraded from roundabout to signals.
- Road widening and pavement reconstruction to provide two traffic lanes in each direction with a central median between the area immediately north of Calala Lane, and Jack Smyth Drive.

Construction is expected to start in 2023[1] with all works expected to be completed within 12 months.

### 2.2.2 Traffic Volumes

#### Calala Lane

Traffic volume data has been collected on Calala Lane, 400 metres west of Burgess Lane. The data includes seven-day tube counts collected between 9 February 2023 and 3 March 2023.

The results indicate that there is an average of around 3,300 vehicles per day (two-way) over a seven-day period with approximately 1,700 vehicles eastbound and 1,600 vehicles westbound. The total traffic volumes each day broken down by vehicle type is detailed Table 2.1.

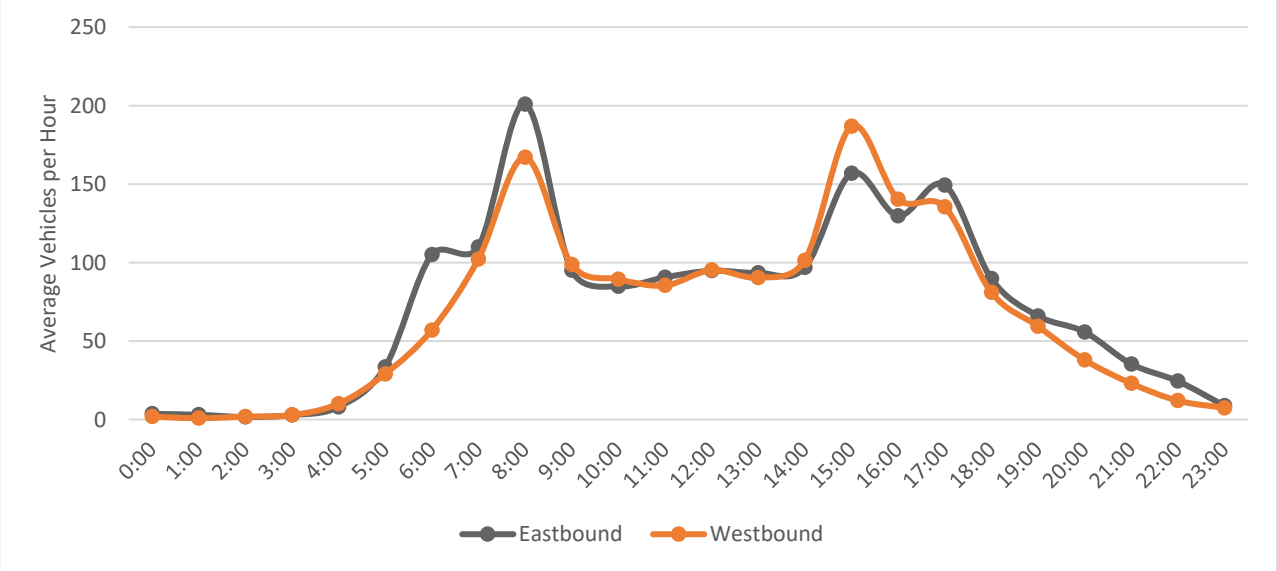
**Table 2.1 – 7-day traffic volumes by vehicle type**

| Vehicle type | Saturday | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Weekday Average |
|---|---|---|---|---|---|---|---|---|
| **Light** | 3014 | 2972 | 2900 | 2870 | 2970 | 2728 | 3458 | 2985 |
| **Heavy** | 225 | 170 | 313 | 319 | 321 | 312 | 344 | 323 |
| **Articulated** | 39 | 52 | 28 | 54 | 37 | 37 | 55 | 42 |
| **B-doubles** | 2 | 1 | 9 | 6 | 9 | 0 | 9 | 6 |
| **Total** | 3280 | 3195 | 327 | 3249 | 3337 | 3077 | 3866 | 3357 |

As shown, Calala Lane currently carries a range of vehicles, including articulated vehicles and B-doubles on both weekdays and weekends. On average, heavy vehicles equate to 11 per cent of total traffic on weekdays and eight per cent on weekends, peaking at around 12 per cent on Tuesdays.

The average weekday traffic volumes for each hour period and per direction is illustrated in Figure 2:2.

**Figure 2:2 – Average weekday traffic volumes**




As shown, peak weekday traffic volumes occur between 8:00am to 9:00am and 3:00pm to 4:00pm, corresponding with general commuter traffic patterns as well as school drop off and pick up periods, noting proximity of the site to the Farrer Memorial Agricultural High School further east on Calala Lane. Around 370 (200 eastbound and 170 westbound) and

[1] Goonoo Goonoo Road (New England Highway) duplication – Tamworth, Submissions Report, Transport for NSW, June 2022

340 (155 eastbound and 185 westbound) vehicles travel along Calala Lane during the weekday AM and PM peak hours, respectively.

### Goonoo Goonoo Road

Existing and future traffic volumes along Goonoo Goonoo Road have been extracted from technical documentation as part of the approved Transport for NSW Goonoo Goonoo Road duplication project. The data is reproduced in Table 2.2 and further discussed in Section 3.2.

**Table 2.2 – TfNSW Goonoo Goonoo Road traffic volumes**

| Year | Location | Vehicles per day | Heavy Vehicle Percentage |
|---|---|---|---|
| **2020** | Between Calala Lane and Greg Norman Drive | 11,364 | 12% |
| | South of Greg Norman Drive | 10,447 | |
| **2030** | Between Calala Lane and Greg Norman Drive | 20,023 | |
| | South of Greg Norman Drive | 19,619 | |

Source: Table 6-1, Goonoo Goonoo Road duplication – Tamworth (New England Highway), Review of Environmental Factors, Transport for NSW, November 2021.

As shown, Goonoo Goonoo Road south of Calala Lane carried about 11,360 vehicles per day in 2020 and expected to carry around 20,020 vehicles per day in 2030 following construction of the approved Goonoo Goonoo Road duplication project. 12 per cent of daily traffic volumes are heavy vehicles in both 2020 and 2030. This is expected given Tamworth is strategically located midway between Brisbane and Sydney and hence plays an important role as an alternate freight route between the two cities, as well as generally servicing the freight movement associated with the surrounding mining industry. Goonoo Goonoo Road is a key link in this freight road network.

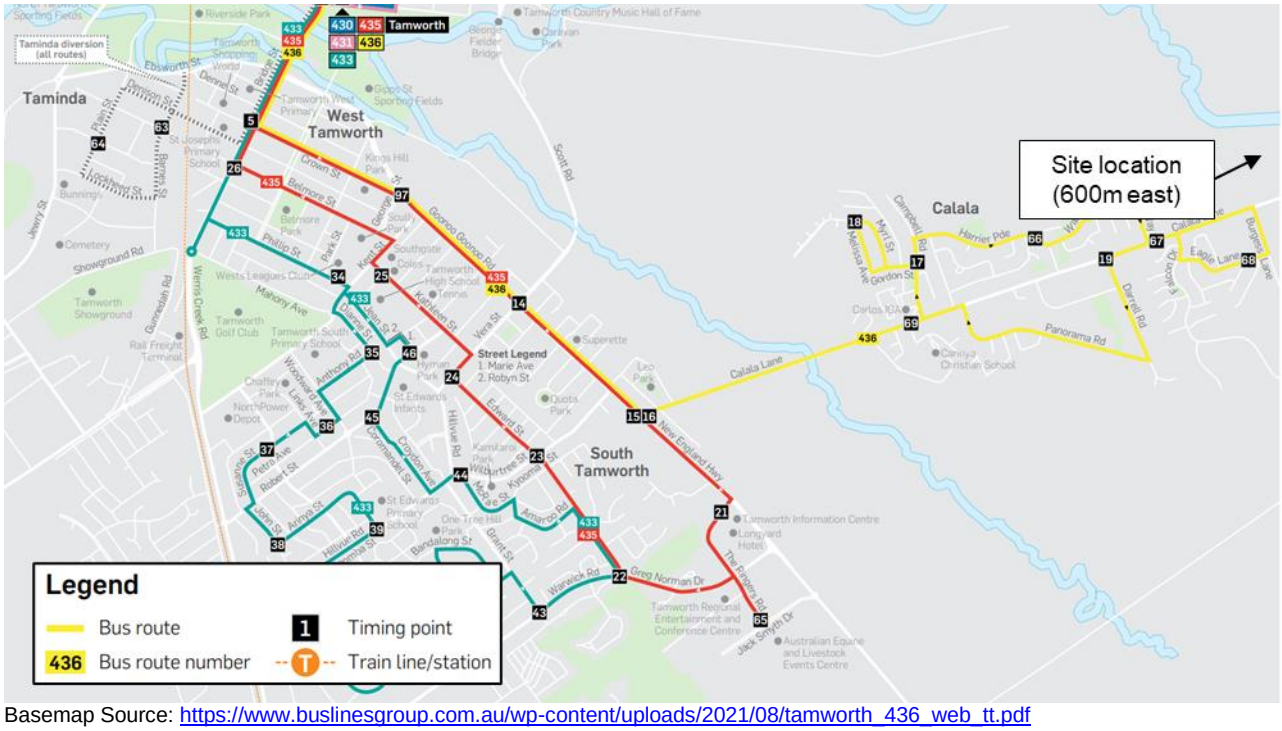
## 2.3 Walking, cycling and public transport

Given the site location, there are limited formal walking or cycling facilities proximate to the site. A single bus route travels through Calala (route 436) that connects Calala with Tamworth Town Centre however the closest bus stops are located a minimum one-kilometre walk from site. An additional bus route is located further west of the site on Goonoo Goonoo Road, (route 435) which provides services throughout South and West Tamworth.

Given the nature of the site and with private vehicle being the predominant form of travel in the area, all vehicle access to/ from the site is expected and considered appropriate.

Notwithstanding and for reference, the existing bus service network is illustrated in Figure 2:3. Route 436 has seven services per day that travel along Calala Lane between 7:00am to 6:00pm.

**Figure 2:3 – Surrounding bus network**




Basemap Source: https://www.buslinesgroup.com.au/wp-content/uploads/2021/08/tamworth_436_web_tt.pdf

## 2.4 Crash history

An analysis the most recent five-year period of available crash data (2017-2022) has been completed based on crash data provided by Transport for NSW for the roads surrounding the site. The locations and severity of the crash data for the five-year period is shown in Figure 2:4 and detailed in Table 2.1.

**Figure 2:4 – Crash map from 2017 to 2021**


**Table 2.3 – Summary of crash data**

| Road | Number of crashes | Number of injuries |
|---|---|---|
| Goonoo Goonoo Road | 14 | 15 |
| Burgmanns Lane | 1 | 0 |
| Ascot-Calala Lane | 2 | 4 |
| Calala Lane | 10 | 11 |
| Total | 27 | 30 |

The following key statistics can be drawn from the crash data:

- One fatality was recorded during the five-year period. The crash occurred further east of the site at the Calala Lane/ O'Brien's Lane intersection with the vehicle travelling off road around the bend and impacting with an object.
- During the reporting period, 27 incidents were recorded resulting in 30 injuries.
- Seven incidents resulted in serious injury, with the remainder being minor, moderate or non-casualty.
- Along Calala Lane, the most common incidents were rear end incidents near Goonoo Goonoo Road or vehicle leaving the road and impacting with an object.

The above analysis does not indicate any such specific safety concerns with the surrounding road network, noting a minor cluster of crashes on the bend where Calala Lane merges with O'Brien's Lane, east of the site, as well as a cluster of crashes along Calala Lane on approach to Goonoo Goonoo Road. It is expected that crash history was investigated as part of design for the Goonoo Goonoo Road upgrades, and signalising the Goonoo Goonoo Road/ Calala Lane intersection will improve safety along this key access route to/ from site.

# 3. Previous Studies

## 3.1 Tamworth Strategic Transport Model (TSTM)

Tamworth plays an important role for northwest regional New South Wales being the largest commercial, retail and residential City in the region. Strategically located midway between Brisbane and Sydney, it plays an important role as an alternate freight route between the two cities.

Council has recently released "Blueprint 100" which is a guiding document for an aspirational target of 100,000 residents by 2041 as part of its status as one of the key regional cities of NSW. The blueprint brings together all the key elements of Council's plans, strategies, precinct plans and masterplans into a single document that seeks to guide and promote the development of the Tamworth Region. It examines 'business and usual' scenario for current growth rates (i.e., a population of 80,000 at 2041) as well as the potential to stimulate the growth of the region to a population of 100,000. The document outlines the goals and aspirations of the community that need to be met to ensure a high standard of living for the community and has been endorsed by both the Deputy Premier and Chief Planner of New South Wales.

With approximately 62,000 people living in the wider Tamworth area, a goal of 100,000 residents represents more than a 60 per cent increase over 20 years. With this level of growth, there is expected to be significant strain placed on the existing transport network of the city, so it is critical to identify and plan for its future infrastructure needs. With the State Government committing to a number of funding packages including $4.2 billion as part of the 20-Year Economic Vision for Regional NSW it is important that the City's needs are able to be quantified and measured.

With this projected growth in mind, a strategic transport model for Tamworth was developed by Stantec to provide Council an understanding of the impact of the projected growth on the network over the next 20 years and into the future.

## 3.2 Goonoo Goonoo Road Upgrades

The Australian and NSW Governments are investing $40 million into the Goonoo Goonoo Road (New England Highway) duplication between Jack Smyth Drive and Calala Lane at the southern end of Tamworth. The duplication will address existing congestion, provide for future growth and improve road safety.

Based on key strategic traffic growth outputs from the TSTM, Stantec (formerly GTA Consultants) completed SIDRA modelling of Goonoo Goonoo Road, with the results and details documented in the New England Highway SIDRA Modelling Analysis TIA (dated October 2021). This assisted in informing Council and TfNSW in understanding the required intersection treatments at the four key intersections along Goonoo Goonoo Road. These intersections include Calala Lane, Craigends Lane, The Ringers Road and Greg Norman Drive. The 2021 study recommended the following key upgrades along Goonoo Goonoo Road, between Calala Lane and Greg Norman Drive:

- Upgrades to Calala Lane intersection including:
  - conversion of roundabout to traffic signals
  - one dedicated right turn lane and one shared right/ left turn lane from Calala Lane
  - dedicated right and left turn lanes from Goonoo Goonoo Road into Calala Lane.
- Upgrades to Craigends Lane intersection including:
  - conversion of existing T-intersection to a roundabout
  - addition of a fourth leg to the roundabout to allow for future development of the area on the eastern side of Goonoo Goonoo Road.
- Upgrades to The Ringers Road intersection including:
  - restriction to left out only from The Ringers Road
  - provision of right turn bay for southbound traffic onto The Ringers Road
- Upgrades to Greg Norman Drive intersection including:
  - creating a two-stage intersection ("seagull" arrangement) across Goonoo Goonoo Road into Greg Norman Drive
  - retaining egress arrangement from Greg Norman Drive.
- Installing a central median to separate oncoming traffic.
- Improving pedestrian and cycling facilities.
- New signage and line marking.

- Road widening and pavet reconstruction to provide two traffic lanes in each direction with a central median between the area immediately north of Calala Lane, and Jack Smyth Drive.

Table 3.1 provides a summary of the modelling results for the Goonoo Goonoo Road / Calala Lane intersection. The results indicate that by 2030, the anticipated traffic volumes will exceed the capacity of the existing roundabout with a Degree of Saturation of 1.15. By upgrading the intersection to a signalised arrangement, a minimum intersection level of service 'C' (i.e. operating well and with spare capacity) can be achieved. On this basis, the report recommended that the roundabout is upgraded to a signalised intersection before 2030.

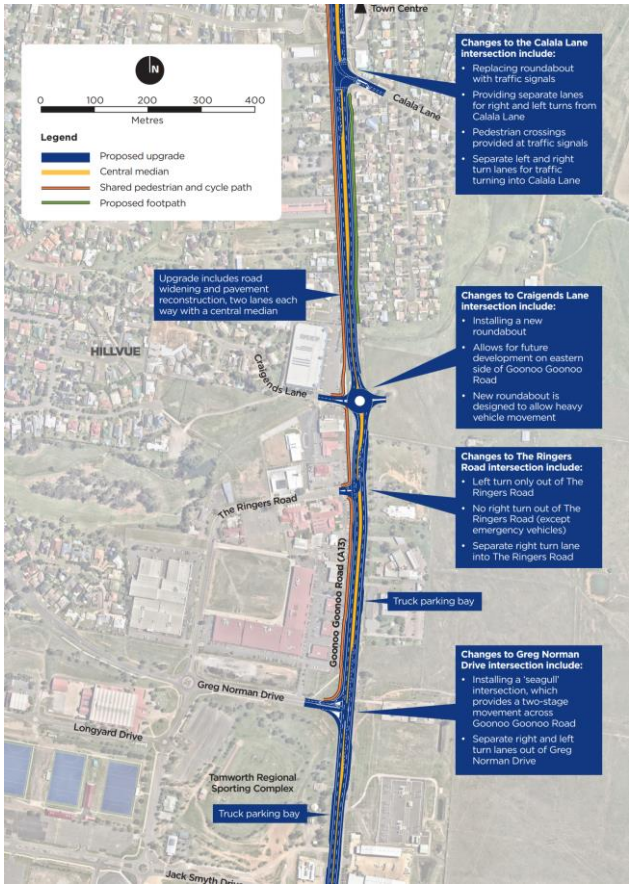
**Table 3.1 – Goonoo Goonoo Road/ Calala Lane intersection modelling results**

| Year | Project/ No project | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | Degree of Saturation | Level of Service | Average Delay (seconds) | Degree of Saturation | Level of Service | Average Delay (seconds) |
| 2020 | No Project | 0.69 | B | 11 | 0.52 | A | 8 |
| | With Project | 0.80 | C | 25 | 0.87 | C | 29 |
| 2030 | No Project | 1.15 | D | 54 | 0.75 | B | 11 |
| | With Project | 0.84 | C | 31 | 0.96 | D | 44 |
| 2040 | No Project | 1.24 | E | 63 | 0.96 | B | 16 |
| | With Project | 0.89 | D | 46 | 0.89 | C | 33 |

Source: Table 6-3: Goonoo Goonoo Road / Calala Lane intersection modelling results, Goonoo Goonoo Road duplication – Tamworth (New England Highway), Review of Environmental Factors, Transport for NSW, November 2021.

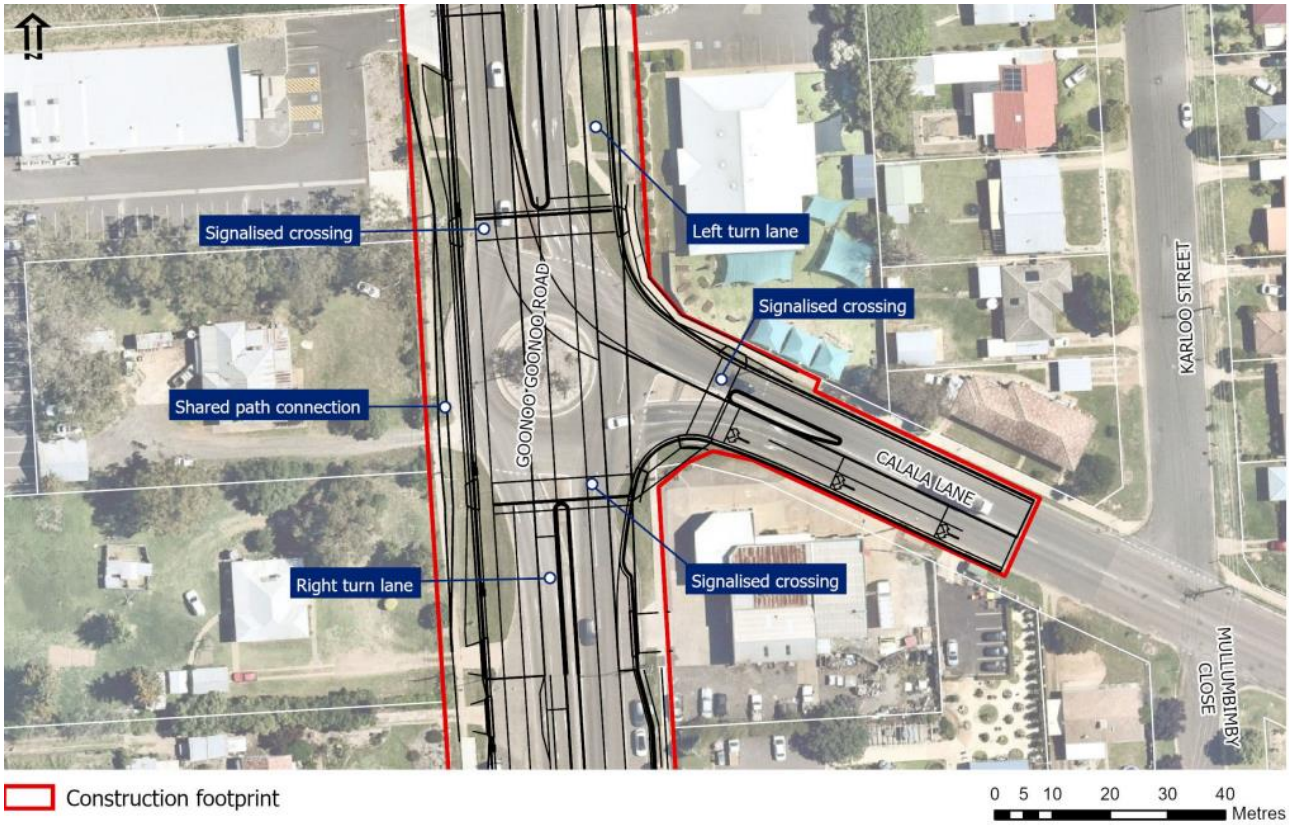
The proposed works are shown in Figure 3:1, with specific works at the Calala Lane intersection shown in Figure 3:2. Following consultation with Transport for NSW in October 2023, it is understood main works are not expected to commence until 2025/ 2026.

**Figure 3:1 – Goonoo Goonoo Road upgrades**




Source: TfNSW, Proposed improvements to Goonoo Goonoo Road (New England Highway) in Tamworth, November 2021

**Figure 3:2 – Goonoo Goonoo Road/ Calala Lane intersection upgrade**




Source: Figure 3-8: Proposed traffic lights at Goonoo Goonoo Road / Calala Lane intersection, Goonoo Goonoo Road duplication – Tamworth (New England Highway), Review of Environmental Factors, Transport for NSW, November 2021.

# 4. Development Proposal

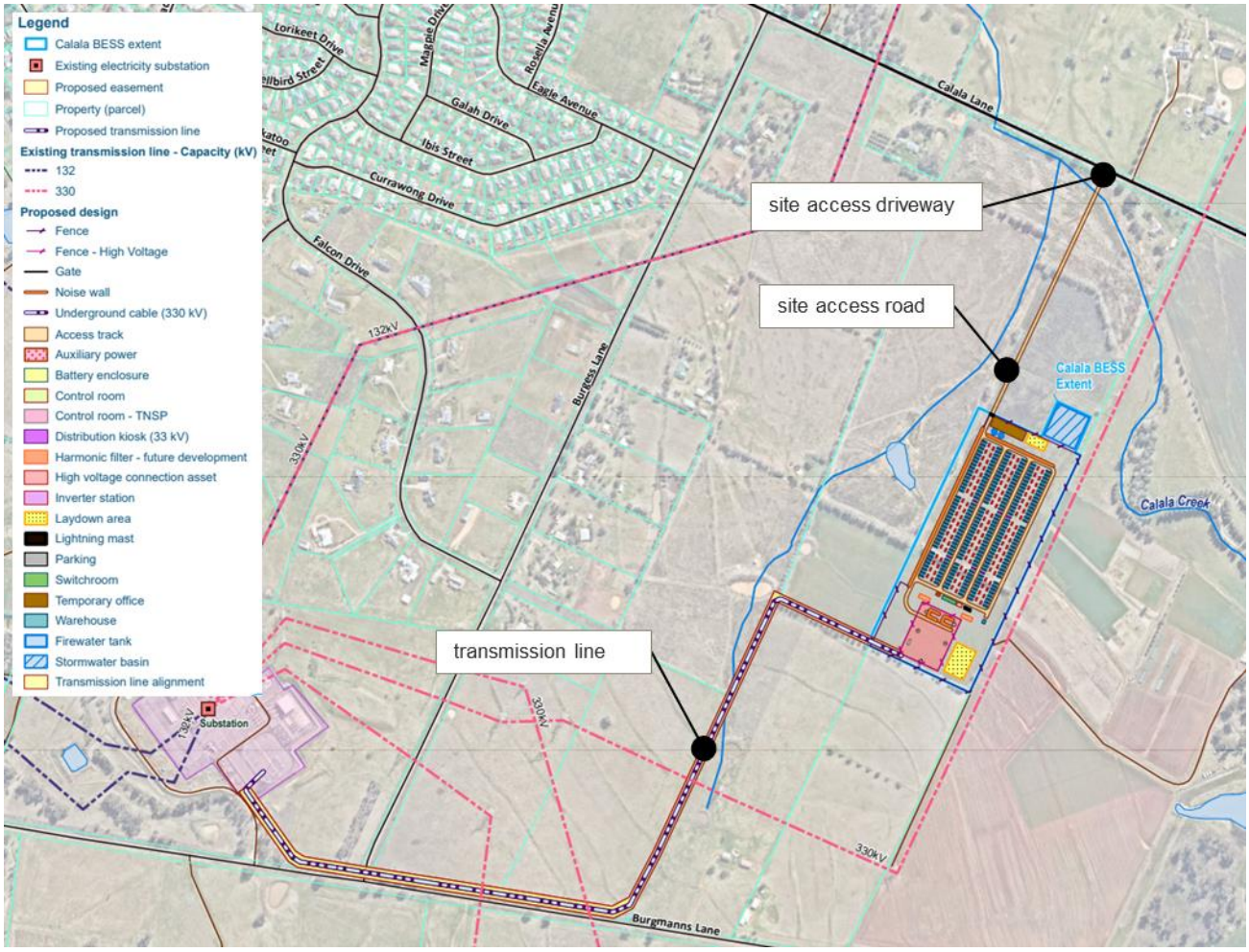
## 4.1 Land Uses

The proposal includes the construction and operation of a large-scale Battery Energy Storage System (BESS). The BESS will provide up to 300 Megawatts (MW) of energy and up to 1200 Megawatt hours (MWh) of battery storage capacity, equivalent to up to 4 hours of storage duration. The proposal will comprise of the following:

- Large-scale BESS including battery enclosures, inverters, DC and AC combiner boxes, transformers and auxiliary components.
- 33/330 kV switchyard
- Underground transmission line connection between the BESS and the nearby TransGrid Tamworth 330 kV substation
- Ancillary elements including site access from Calala Lane, internal access roads and parking, control room and staff amenities, warehouse, stormwater and fire management infrastructure, utilities, signage, fencing, security systems, 4 metre and 5 metre high noise attenuation walls and landscaping.

The proposed site layout is shown in Figure 4.1.

**Figure 4.1 – Site layout**




Source: Calala BESS Site Plan, Equis Energy, exported 6 July 2023

# 5. Parking and Transport Assessment

## 5.1 Traffic and Parking

The site will be operated remotely hence there will be no permanent on-site staff. Maintenance staff in 99th percentile vehicles (cars, vans utes) will be required to occasionally service the facility and hence the site is expected to generate low traffic volumes of up to one to two vehicles per day. As such, the proposal is not expected to result in any change to traffic conditions in and around the site and the proposal could not be expected to compromise the safety or function of the surrounding road network.

With no permanent on-site staff only a minor quantum of on-site parking is required for use by maintenance vehicles as required. The car park layout and internal road network will be designed in accordance with the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004, AS2890.2:2018 and AS/NZS2890.6:2009), as well as Tamworth Regional Council Development Control Plan 2010.

The main impact of the proposal will be through the construction of the BESS, with an assessment of construction impacts set out in Sections 6 and 7.

## 5.2 Vehicle Access

Vehicle access is proposed via a new access driveway on Calala Lane in the north-east corner of the site, as shown in Figure 4.1. The vehicle access will be designed in accordance with the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS2890.2:2018), as well as Tamworth Regional Council Development Control Plan 2010.

In assessing the desirable sight distance requirements of the proposed access, reference has been made to both the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*, relating the access to an unsignalised intersection arrangement, and *Australia/ New Zealand Standard Parking Facilities Part 2 Off Street Car Parking (AS2890.2:2018)*, relating the access to a typical driveway used for both 99$^{th}$ percentile vehicles (cars, utes, vans) during operation, and heavy vehicles during construction.

Calala Lane is signposted as 100 kilometres per hour. The recommended Safe Intersection Sight Distance (Austroads, 2017) at an unsignalised intersection based on a driver reaction time of 2.0 seconds is 248 metres. The AS2890.2 desirable and minimum sight distances for a typical driveway are 139 metres and 222 metres, respectively.

The proposed site access driveway is in a good location with respect to road safety, with Calala Lane sight lines in both directions that exceed all relevant Austroads and Australian Standards requirements as demonstrated in Figure 5.1 and Figure 5.2.

Overall, the proposed site access arrangements are considered suitable as part of the proposed development.

**Figure 5.1 – Calala Lane sightlines (looking west)**

**Figure 5.2 – Calala Lane sightlines (looking east)**

# 6. Construction Traffic Assessment

## 6.1 Overview

This overview of construction traffic impacts associated with construction activity aims to ensure the safety of all workers and road users in the vicinity of the construction site. The primary objectives of the Traffic Management Plan (TMP) includes the following:

- To identify the need for adequate and compliant traffic management requirements within the vicinity of the site.
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers.
- To inform the Contractor and set the ground rules for managing the construction traffic associated with the construction site.

A TMP will be prepared by the appointed contractor however to understand the likelihood of any such construction traffic related impacts, the following includes a summary of the proposed works, staging, site access arrangements, heavy vehicle volumes and arrival and departure routes.

## 6.2 Key Principles

The overall principles of traffic management during the construction activity include:

- Provide an appropriate and convenient environment for pedestrians.
- Minimise the impact on pedestrian movements.
- Maintain appropriate capacity for pedestrians at all times on footpaths around the site.
- Maintain appropriate public transport access.
- Maintain current levels of parking within the precinct.
- Maintain permanent access to/ from the hospital accesses for emergency services.
- Restrict construction vehicle movements to designated routes to/ from the site.
- Manage and control construction vehicle activity in the vicinity of the site.
- Minimise impacts to general traffic in the vicinity of the site.

## 6.3 Works Schedule and Work Hours

The expected duration of the works is approximately 15 months commencing Q1 2024 and concluding Q2 2025, subject to development approval. The indicative key milestones for the project are shown in 1, with details of the main activities and duration of each stage. Some overlap of stages is expected.

**Table 6.1 – Indicative construction stages**

| Phase | Month | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Site mobilization | | | | | | | | | | | | | | | |
| Clearing of surface vegetation and installing security fences | | | | | | | | | | | | | | | |
| Benching of site | | | | | | | | | | | | | | | |
| Delivery of components and equipment | | | | | | | | | | | | | | | |
| Installation of components and commissioning | | | | | | | | | | | | | | | |
| Site rehabilitation, landscaping and vegetation works | | | | | | | | | | | | | | | |
| Site demobilization | | | | | | | | | | | | | | | |

Construction work is planned to be completed in accordance with the development consent conditions with the typical work hours anticipated to be:

- Monday to Friday: 7:00am to 6:00pm
- Saturdays: 8:00am to 1:00pm
- Sundays/ public holiday: No work.

## 6.4 Construction Workers

The anticipated number of construction workers on site for each month is detailed in Table 6.2. For the majority of the construction program, between three to 37 construction workers are expected on site each day. Peak activity is expected to occur over a four-month period, with between 68 and 85 construction workers expected on site each day.

**Table 6.2 – Indicative number of on-site construction workers**

| | Month | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Daily Construction Workers | 3 | 4 | 68 | 71 | 81 | 85 | 37 | 36 | 27 | 27 | 27 | 13 | 13 | 6 | 7 |

Construction workers are expected to use accommodation available within Tamworth and the surrounds.

Sufficient dedicated on-site worker parking will be provided, including formal on-site worker parking for 60 vehicles, with capacity for additional informal worker parking, as required. Equis Energy is committed to encouraging workers to carpool at all times to limit both vehicle movements and on-site parking demand where practical. No construction related vehicles will be permitted to park on public roads at any time. A drop-off and storage facility will be provided on-site for larger tools and equipment. As such, the parking impacts associated with construction workers will be negligible.

## 6.5 Concrete Batch Plants

A concrete batch plant will not be provided within the site boundary. All concrete will be sourced from off-site.

## 6.6 Construction Traffic

### 6.6.1 Vehicle Types

Construction of the BESS project will involve a combination of OSOM vehicles, heavy vehicles and light vehicles. Construction traffic will be generated by the delivery of equipment and materials, as well as construction workers travelling to and from the site daily, using a combination of heavy and light vehicles as detailed below.

#### Over Size and Over Mass Vehicles

Four OSOM vehicles will be required for the delivery of two 33/330KV transformers, switch room and control room. These are discussed further in Section 7.

It is noted that other larger items being shipped, including the Inverter unit, MVPS unit, Quantum Cube Unit and Cabinets, are expected to be delivered with a side loader, with dimensions comprising 2.5 metre width, 19 metre length and 4.1 metre height, and total weight of 35 tonnes, and hence do not qualify as OSOM and therefore form part of the standard construction traffic impact assessment.

#### Heavy Vehicles

The site will have various types of heavy construction vehicles accessing the site. Typical heavy vehicles likely to be generated by construction activities include:

- 19 metre side loader
- 26 metre B-doubles
- 20m semi-trailers
- 12.5m heavy rigid vehicles (HRV)
- 8.8m medium rigid vehicles (MRV)
- 6.4m small rigid vehicles (SRV).

Other construction vehicles to be used on site during certain activities, including access road construction, cable trench digging and benching include, though not limited to the following:

- articulated dump trucks (Moxy's).
- medium wheel loaders.
- crawler dozers (bulldozers).
- graders.
- ditch witch (trenchers).

#### Light Vehicles

Most vehicle trips will typically be light vehicle movements (attributed to project personnel and workers) comprising all cars, vans, 4WD's and utility vehicles.

### 6.6.2 Traffic Volumes

For the majority of the construction program (12 of the planned 15 months), the site is expected to generate around 67 vehicles (one-way) per day, comprising around 60 light vehicles and seven trucks. It is expected that for a peak one-month period, construction activity will result in up to 465 construction vehicles (one-way) per day, comprising around 85 light vehicles and 380 trucks. For the remaining three months, the site is expected to generate an average of around 230 vehicles (one-way) per day, comprising 70 light vehicles and 160 trucks.

A breakdown of the anticipated traffic generation estimates by type of vehicle in provided in Table 6.3.

**Table 6.3 – Daily construction traffic volumes**

| Type of Vehicle | Average traffic generation (vehicles per day)<br>12 month period | Shoulder peak average traffic generation (vehicles per day)<br>3 month period | Peak traffic generation (vehicles per day)<br>1 month period |
|---|---|---|---|
| **Light vehicles** | 60 | 70 | 85 |
| **Heavy vehicles** | 7 | 160 | 380 |
| **Total vehicles** | 67 | 230 | 465 |

A further four OSOM vehicle movements will occur across the project programme.

Peak light vehicle hourly traffic volumes typically occur during construction worker arrival and departures around 7:00am and 5:00pm on weekdays. On average across the entire works period, around 30 light vehicle movements would be expected to arrive or depart site around these times, or 50 to 60 movements during peak construction. Otherwise, for most of the construction programme (12 months), the site is expected to generate up to six vehicle movements per hour across the day. During peak construction activity, the site is expected to generate around 70 to 80 vehicle movements per hour throughout the day.

## 6.7 Vehicles Routes

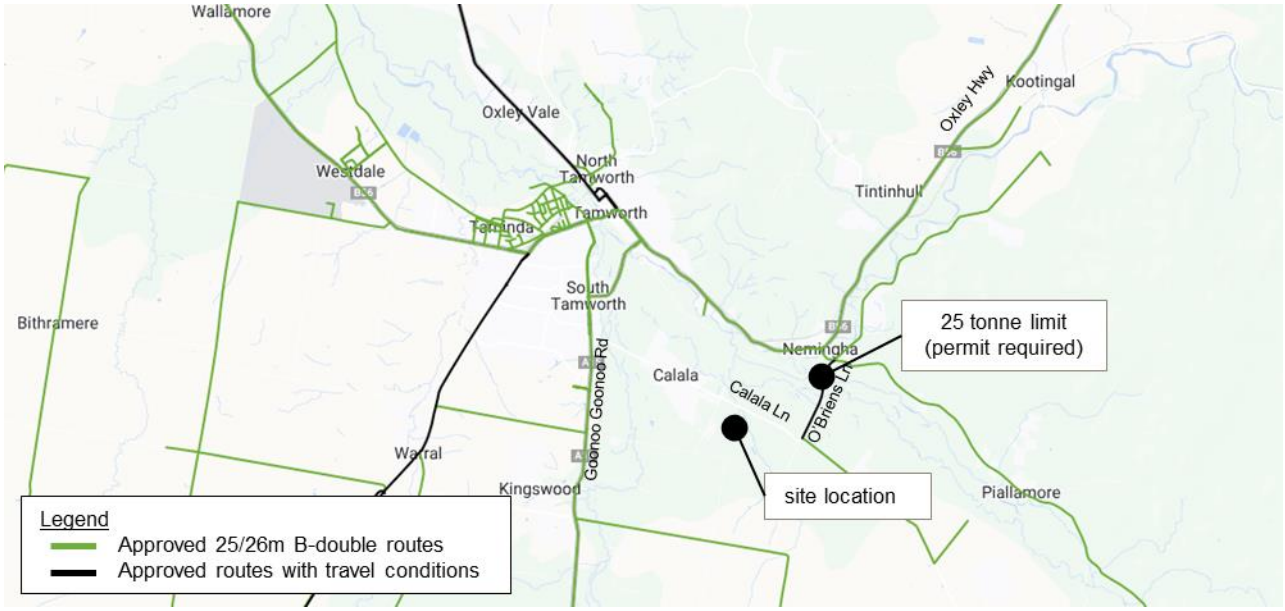
### 6.7.1 Over Size Over Mass Vehicles

The designated OSOM vehicle routes are discussed in Section 7.

### 6.7.2 Heavy Vehicles

Heavy vehicle movements will be restricted to designated routes and confined to the State and Regional Roads, where practical and required. The approved routes for B-doubles as designated by Transport for NSW will also be considered. The existing approved 26 metre B-double routes in the broader region are detailed on the NSW Load Carrying Network Map from Transport for NSW and are reproduced in Figure 6.1. Goonoo Goonoo Road/ New England Highway and Oxley Highway near and on-route to the site are approved B-double routes. O'Brien's Lane up to the intersection at Loomberah Road is an approved route subject to obtaining a travel permit from Council due to the 25-tonne load limit. As discussed in Section 2.2.2, Calala Lane can currently accommodate B-doubles however is not formally designated as a Transport for NSW approved route.

**Figure 6.1 – Existing B-double approved routes**

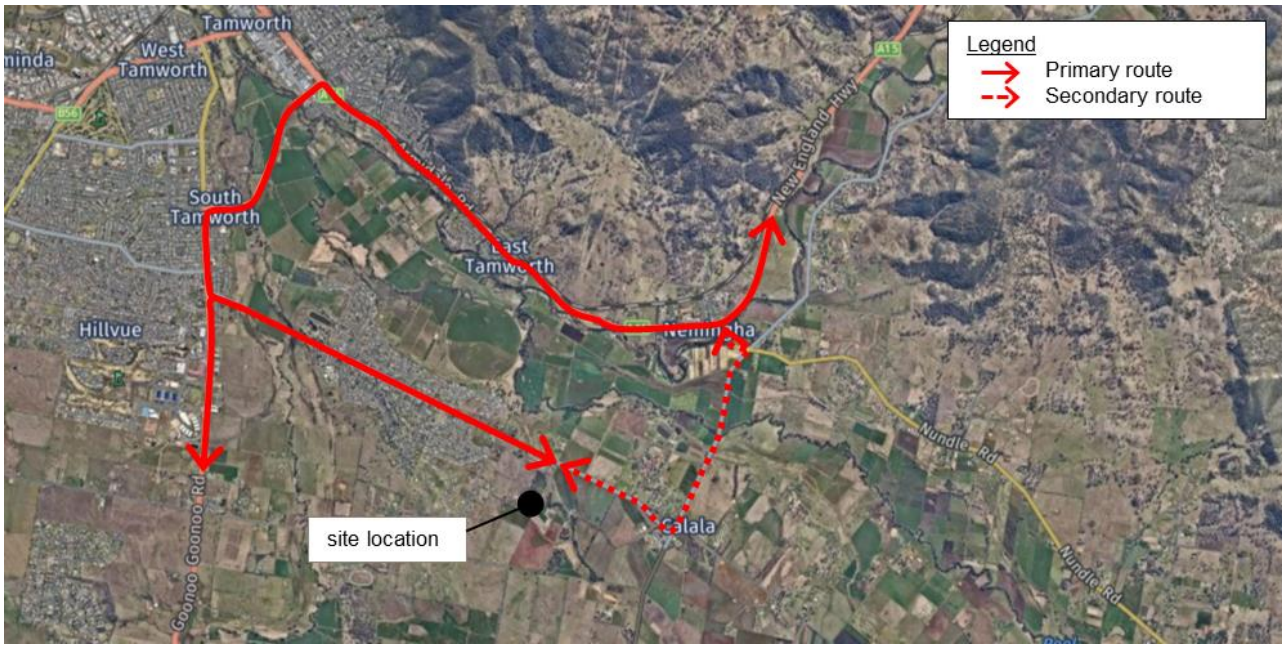



Base image source: https://roads-waterways.transport.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html, accessed July 2023

Heavy vehicle routes to/ from the construction site, as shown in Figure 6.2 have been identified with the aim of minimising the impact of construction traffic on the surrounding road network.

Truck drivers will be advised of the designated heavy vehicle routes to and from the site. The directional distribution and assignment of traffic will be influenced by several factors, most notably the origin/ destination of materials, configuration of access points to the site, configuration of the arterial road network and the approved NSW B-double road network.

**Figure 6.2 –Construction vehicle approach and departure routes**




Base image source: http://www.street-directory.com.au/

## 6.8 Traffic Impact

The main impact of the proposal will be through the construction of the BESS. The additional traffic generated during the construction period will generally be relatively minor compared to the existing daily traffic volumes along Goonoo Goonoo Road, however along Calala Lane, the proportional increase in traffic as a result of the development is expected to be higher as a result of lower existing traffic volumes on the road network. Notwithstanding, it is not anticipated that the construction traffic volumes will result in significant adverse impact on the safety or function of the road network.

A summary of the anticipated increase in traffic in relation to the existing traffic data outlined in Section 2.2.2 is included in Table 6.4. It is noted that this assumes all development traffic will travel to and from the site in a westbound direction via Calala Lane and Goonoo Goonoo Road. In reality, some vehicle trips will travel in an eastbound direction via Calala Lane and O'Brien's Lane. Until a preferred construction contractor has been identified, it is currently not possible to accurately determine the origin-destination route that light and heavy vehicles will take during construction.

**Table 6.4 – Anticipated average increase in daily traffic volumes on the surrounding road network**

| Road | Existing daily traffic volumes [1] | Anticipated average increase | |
|---|---|---|---|
| | | Typical average traffic generation (two-way movements) [2] | Peak traffic generation (two-way movements) [2] |
| **Calala Lane** | 3,356 | 134 (4% increase) | 930 (28% increase) |
| **Goonoo Goonoo Road** | 11,364 | 134 (1% increase) | 930 (8% increase) |

[1] Existing traffic volumes discussed in Section 2.2.2
[2] Average vehicles per day multiplied by two to consider two-way trips.

Analysis of mid-block level of service for Calala Lane and Goonoo Goonoo Road has been conducted based on criteria set in Transport for NSW Guide to Traffic Generating Developments 2002 for a two-lane rural road with rolling terrain for Calala Lane and level terrain for Goonoo Goonoo Road, and sign posted speed limit of 100 kilometres per hour, with a summary of the criteria provided in Table 6.5. Transport for NSW note that a Level of Service C is desirable.

**Table 6.5 – Peak hour flow on two-lane rural roads (veh/hr)**

| Level of Service | Description | Peak Hour Flow [1] | |
|---|---|---|---|
| | | Calala Lane | Goonoo Goonoo Road |
| **B** | This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A | 310 | 530 |
| **C** | This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level | 570 | 870 |
| **D** | This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems. | 700 | 1410 |
| **E** | This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam. | 1,510 | 2290 |

Source: Table 4.5, Transport for NSW Guide to Traffic Generating Developments 2002
[1] Conservatively assumes 15 per cent heavy vehicle composition.

As discussed, the maximum peak hour traffic generated during construction is estimated to be up to 60 vehicles per hour for light vehicles arriving to / from site at the beginning and end of each workday, or between six and 80 vehicles per hour, comprising both light and heavy vehicles across the day. As such, the maximum uplift in traffic volumes in any hour period throughout construction is expected to be about 80 vehicles in any hour period.

Calala Lane currently carries an average of 240 vehicles per hour between 7:00am and 5:00pm on weekdays, with up to 370 vehicles in any peak hour. On this basis, and with peak construction activity potentially up to 80 vehicles per hour, the total peak hour volumes would be 450 vehicles per hour along Calala Lane. Based on traffic modelling as contained in the SIDRA modelling analysis for Goonoo Goonoo Rood and discussed in Section 3.2, Calala Lane is expected to generate up to 0.77 per cent traffic growth in any direction per annum during peak periods. Conservatively assuming one per cent growth per annum, to 377 vehicles would be expected in the future growth year of 2025. On this basis, and with peak construction activity potentially up to 80 vehicles per hour, the total peak hour volumes would be 457 vehicles per hour along Calala Lane.

Calala Lane will therefore continue to operate at an acceptable Level of C or better right throughout the construction period.

Based on traffic volumes as contained in the SIDRA modelling analysis for Goonoo Goonoo Road and discussed in Section 3.2, Goonoo Goonoo Road south of Calala Lane carried around 1,130 and 1,280 vehicles during the AM and PM peak hours in 2020, and hence operated with a Level of Service C where it tapers to one lane in each direction. Conservatively assuming all 80 vehicles during the peak periods were to travel south of Goonoo Goonoo Road (i.e. towards Newcastle), Goonoo Goonoo Road would operate with 1,210 and 1,360 vehicles per hour and therefore continue to operate with a Level of Service C.

Further, assuming a future growth year of 2025, Goonoo Goonoo Road south of Calala Lane is expected to carry around 1,436 and 1,620 vehicles during the AM and PM peak hours, and hence would operate with an acceptable Level of Service D where it tapers to one lane in each direction. Conservatively assuming all 80 vehicles during the peak periods were to travel south of Goonoo Goonoo Road (i.e. towards Newcastle), Goonoo Goonoo Road would operate with 1,516 and 1,700 vehicles per hour and therefore will continue to operate with an acceptable Level of Service D.

As such, peak construction activities are not expected to impact the midblock operation of Goonoo Goonoo Road.

Following from the SIDRA modelling results contained in Table 3.1, further review of the operation of the Calala Lane/ Goonoo Goonoo Road intersection in SIDRA, conservatively assuming a 2025 base year scenario with a total of 80 heavy vehicles (40 arriving, 40 departing) generated by construction of the BESS at peak construction during both road network peak hours, indicates that the intersection will continue to operate well and similar to the base condition in both peak hours. This also assumes a 50/50 split of heavy vehicles traveling south and north, noting naturally vehicles traveling north have a greater impact to operation of the intersection given the right turn is more constrained. Table 3.1 indicates that the intersection will operate with a Degree of Saturation of 1.15 in 2030 during the AM peak hour in its current roundabout arrangement. This is primarily a result of the significant traffic growth along Goonoo Goonoo Road in the AM peak hour (around six per cent per annum). As such, the intersection is expected to continue operating well in 2024/ 2025 and with spare capacity to accommodate the uplift in traffic resulting from construction of the BESS.

## 6.9 Cumulative Impacts

As discussed in Section 3.2, the Australian and NSW Governments are investing $40 million into the Goonoo Goonoo Road (New England Highway) duplication between Jack Smyth Drive and Calala Lane at the southern end of Tamworth. This includes the conversion of the existing Goonoo Goonoo Road/ Calala Lane intersection from a roundabout to signals. The proposed works are shown in Figure 3:1, with specific scope of works to the Calala Lane intersection shown in Figure 3:2.

The works are expected to generate up to 60 heavy and 40 light construction vehicle movements per day during peak construction activity. All existing traffic movements would generally be maintained during construction; however, some temporary lane closures would be required on Goonoo Goonoo Road and adjacent local roads, with such measures to be in accordance with the detailed TMP and, where necessary, a Road Occupancy Licence. Two possible construction compounds have been identified adjacent to Goonoo Goonoo Road; on the eastern side of the road proximate to Craigends Lane and Greg Norman Drive.

Naturally the proposed road works corresponds with the construction vehicle routes proposed for the BESS development. Notwithstanding, following consultation with Transport for NSW in October 2023, it is understood main works are not expected to commence until 2025/ 2026. As such, construction of the Goonoo Goonoo Road (New England Highway) duplication is unlikely to overlap with construction of the BESS.

It will naturally be critical that the contractor engages with all relevant stakeholders, including the contractors for the proposed road works, to understand whether there will be any overlap in construction programme and if so, to ensure appropriate coordination of construction activities and to maintain safety for all users of the road network at all times.

Further discussion around cumulative construction works with OSOM vehicle movements to site is included in Section 7.

## 6.10 Public Transport

Consultation with all bus operators will occur during the preparation of the TMP by the nominated contractor and will continue as necessary throughout the construction period. Given the low volume of OSOM vehicles during works, it is not anticipated that the works will cause any such adverse impacts to school or public bus services. Nonetheless, during construction, the following mitigation measures shall be implemented to avoid impacts on bus operations:

- Information collected on bus routes and times (public buses and school buses) will be included in the induction for Equis Energy and form part of the Drivers Code of Conduct.
- Regular drivers will be instructed to be aware of the potential for passengers waiting at bus stops and buses stopping to pick up passengers during these times.

- If complaints are received from bus operators or passengers then the procedures in Section 8.1.6 will be implemented, including reviewing vehicle tracking information for vehicles in the vicinity at the time of the complaint. Additional traffic management controls may be implemented where required.

## 6.11 Road Upgrades

No road upgrades are proposed to support the development, noting Calala Lane can already support heavy vehicle movements (as discussed in Section 2.2.2). Any minor works associated with accommodating OSOM vehicles are discussed in Section 7 and will be developed further in consultation with relevant stakeholders during preparation of the TMP by the appointed contractor.

## 6.12 Traffic Guidance Schemes

Detailed information for work site operations is contained in the Traffic Control at Work Sites manual (Roads and Maritime, 2018). The control of traffic at work sites must be undertaken with reference to WorkCover requirements and any other Workplace Health and Safety manuals. The Contractor will be required to provide TGS's for the proposed works which will generally consider the following:

- Construction vehicle activity, including the loading/ unloading of trucks to be conducted within the work site.
- Pedestrians and all passing vehicles will maintain priority.
- Clear definition of the work site boundary to be provided by erection of A Class hoardings around the site boundaries.
- All construction vehicle activity will be minimised during peak periods, where possible.

## 6.13 Driver Code of Conduct

An overview Driver Code of Conduct is provided in Section 8.

## 6.14 Mitigation and Management Measures

Table 6.6 summarises all recommended mitigation measures to be finalised and documented in the TMP prepared by the contractor post approval of the development. For each measure, the responsible party and stage of project is listed.

**Table 6.6 – Mitigation and management measures**

| Factor | Management of control measure | Responsibility | When does this apply? |
|---|---|---|---|
| **Permits/ Consent/ Licences** | • Contractors will abide by the TMP to be developed post submission in consultation with all relevant stakeholders.<br>• All construction will comply with requirements of Section 138 of the Roads Act 1993 'Works and Structures'.<br>• The contractor will ensure that all traffic management approvals for works / traffic management arrangement along Local Roads associated with OSOM movements are obtained from the relevant Council prior to any work commencing.<br>• The contractor will be responsible for obtaining all access permits and approvals under the National Heavy Vehicle Law and Regulations. | Contractor | Throughout construction |
| **Haulage** | • The contractor will use an appropriately licensed haulage contractor for haulage of any items to site. The contractor will have experience in transporting similar loads and be responsible for obtaining all required approvals and permits from Transport for NSW or National Heavy Vehicle Regulator and Councils and for complying with conditions specified in the approvals.<br>• All loaded vehicles entering or leaving site will have their loads covered or contained. | Contractor | During construction |
| **Access point requirements** | • Sight distance requirements will meet Austroads Guide.<br>• Drag-out from vehicles onto the public road will be monitored. A tyre cleaning grid will be installed if needed.<br>• Temporary truck signage will be installed, throughout the construction period. | Contractor | Throughout construction |

| Factor | Management of control measure | Responsibility | When does this apply? |
|---|---|---|---|
| **Consultation** | • Effective on-going consultation will be undertaken with relevant stakeholders during preparation of the TMP and throughout construction.<br>• Liaison activities will occur with the community prior to and throughout construction. | Equis in conjunction with the contractor | Prior to, throughout and post construction |
| **Traffic control plans** | • Any specific TGSs required will be developed by personnel duly qualified and certified by training in accordance with Traffic Control at Work Sites and prepared in consultation with Transport for NSW and local councils, as required. | Contractor | Pre-construction and as required during construction |
| **Delays to traffic** | • Construction trucks are to follow approved routes at all times.<br>• Light vehicles to always drive responsibility and consider other road users. This will be incorporated in the site induction.<br>• Construction trucks' arrival and departure are to be planned with consideration to minimising effect to other road users during peak traffic periods. | Contractor | During construction |
| **Safety of road users and construction staff** | • Work is to be arranged so workers can undertake work safely, and where possible road users and workers are kept separated.<br>• Place signs and devices before proceeding with works.<br>• Ensure signs are not obscured by vegetation, vehicles, plant or other traffic control signs/ devices and that signs are placed in the correct order.<br>• Where traffic controllers are required, they must be suitably qualified having passed Transport for NSW approved training courses.<br>• Traffic controllers (or portable traffic signals if directing traffic to cross barrier lines) shall be used if road users are to be directed to disobey a traffic regulation.<br>• All traffic controllers are to wear high visibility external clothing.<br>• Signs, devices and TGSs shall be used to warn, inform and guide road users safely around, through or past work areas.<br>• Signs, devices and TGSs are to be removed from the site upon completion of the work.<br>• Specific TGSs will be prepared for all work which involves any form of traffic control or restriction.<br>• An increased risk of rear end collisions arises in any location where road traffic is stopped for a period of time. Ensuring that there is sufficient warning to road users before encountering the queue is essential.<br>• Depending on the situation this may require extending the length of a sign posted roadwork speed zone in the development of the TGS, using oversized signs, flashing light signs and variable message signs. | Contractor | During construction |
| **Driver's code of conduct** | • An overview drivers code of conduct has been provided in Section 8.<br>• The code of conduct will be revised by Equis Energy in conjunction with the contractor prior to commencement of on-site works for the project.<br>• It is Equis Energy's expectation that the Code of Conduct will be implemented for all traffic and transport construction activities associated with construction. | Equis Energy in conjunction with the project | During construction |
| **School Bus Routes** | • Details and times of school bus routes will form part of the site induction, so all drivers will be aware.<br>• Consultation will occur and be ongoing with bus operators. | Equis Energy in conjunction with contractor | During construction |

# 7. Over Size Over Mass Vehicle Assessment

## 7.1 Overview

The major components of the BESS will need to be transported by OSOM vehicles. These vehicles will require special operating permits to allow them to travel on public roads and the appointed licensed haulage contractor will be required to complete a detailed assessment for approval by TfNSW and local councils prior to construction. Namely, these vehicles are those that are over the dimensional and mass limits specified by the National Heavy Vehicle Regulator (NHVR), triggering the OSOM permit process and may require one or more escort vehicles to accompany them. These limits are as follows:

- Oversize:
  - Greater than 19 metres in length
  - Greater than 2.5 metres in width
  - Greater than 4.3 metres in height.
- Overmass:
  - Heavier than 42.5 tonnes.

The process of obtaining permission to transport the BESS components involves formal approval to access the TfNSW and Council road networks, as well as obtaining the required permits for road works to facilitate the manoeuvring of OSOM vehicles and their respective loads. These temporary (or permanent) works could include light poles/ power poles relocation, modified traffic signals and associated infrastructure, safety barrier impacts, general signage changes and tree pruning/ removal.

There are several variables that may impact which route and/ or port is optimal for transport of OSOM components during construction. This includes, but not limited to port availability at the time of year components are being shipped from overseas, weather events that may impact access along routes (floods etc.) and further engineering studies demonstrating structures as viable or unviable for transporting the required loads.

For the purposes of SSDA approval, an OSOM vehicle route has been reviewed in detail to better understand the impact of OSOM vehicle movements on the road network and to confirm an appropriate route is available for OSOM travel. The OSOM route would be subject to further review and finalisation following engagement of a contractor and subsequent preparation of the Transport Management Plan (and following SSDA approval). All relevant requirements relating to OSOM vehicle movements will be detailed in the TMP, to be prepared as a required by the development consent conditions prior to construction and approved by the Secretary of the NSW Department of Planning, Industry and Environment.

## 7.2 Vehicle Specifications

It is understood that there are two OSOM vehicles transporting the BESS components to the site:

- 31.4m long EQUIS 9R8 and Dolly:
  - vehicle expected to transport two 33KV transformers – actual vehicle may be a smaller 21m vehicle, however EQUIS 9R8 tested to ensure assessment is suitably conservative
  - with components loaded, combined vehicle and component height and width expected to be around 5.2m tall and 4.1m wide.
- 30.8m long EQUIS 8R8:
  - vehicle expected to transport the switchroom and control room to the site
  - with component loaded, combined vehicle and component height and width expected to be around 5.3m tall and up to 4.3m wide (switch room is 4.2 metres wide, control room is 4.3 metres wide).

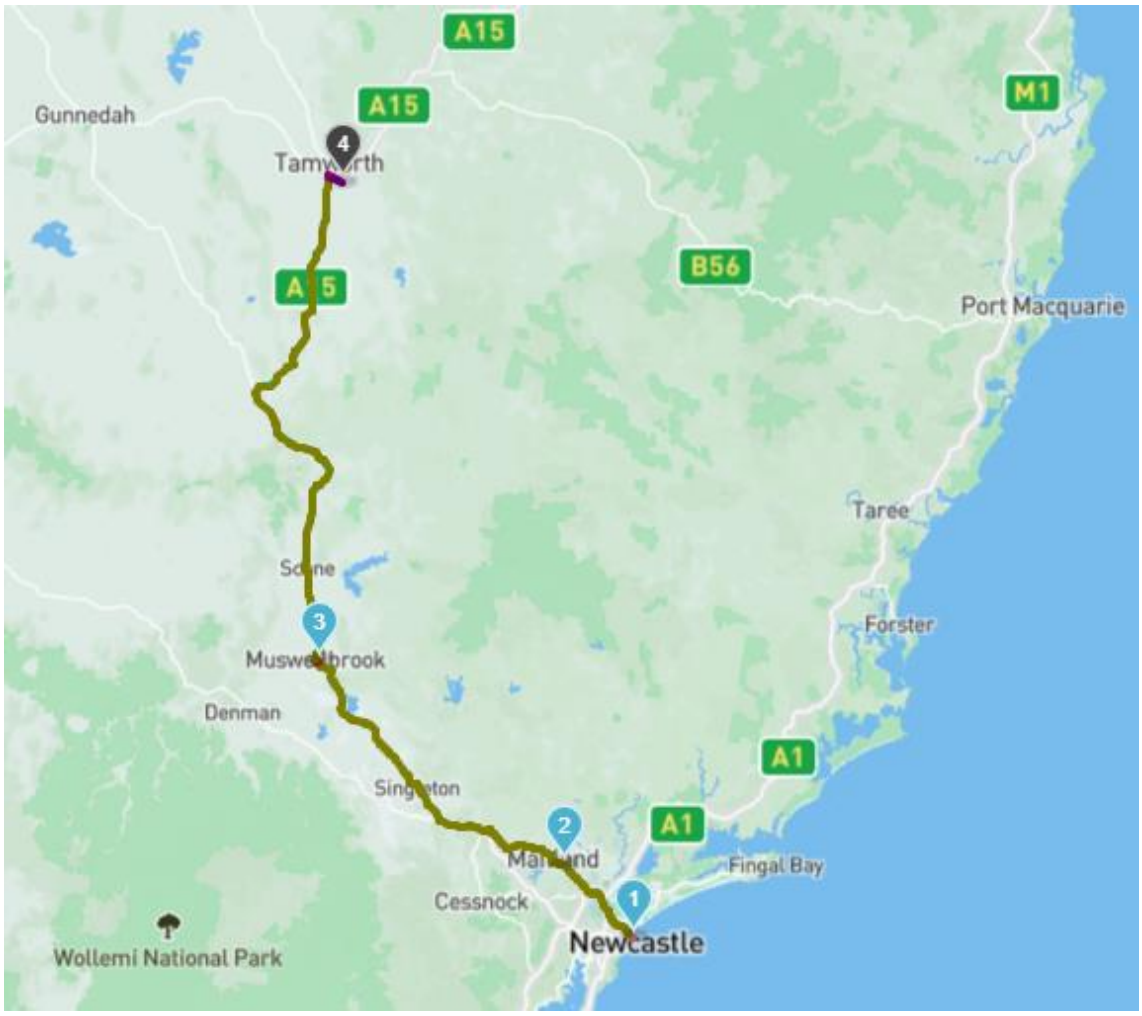
The various vehicle specifications are detailed in Appendix A.

## 7.3 Vehicle Route

### 7.3.1 Route Selection

Based on this proposed OSOM vehicle dimensions and site location, a potential route has been developed for transporting the components to site from the Port Newcastle. The origin destination route to site as shown in Figure 7.1 commences at Port of Newcastle and travels along the Hunter Expressway and New England Highway via Singleton, Muswellbrook and Scone. This route has been planned through review of the Route Planner Tool from the National Heavy Rigid Vehicle Regulator (NHVR), as well as the NSW Load Carrying Network Map from TfNSW.

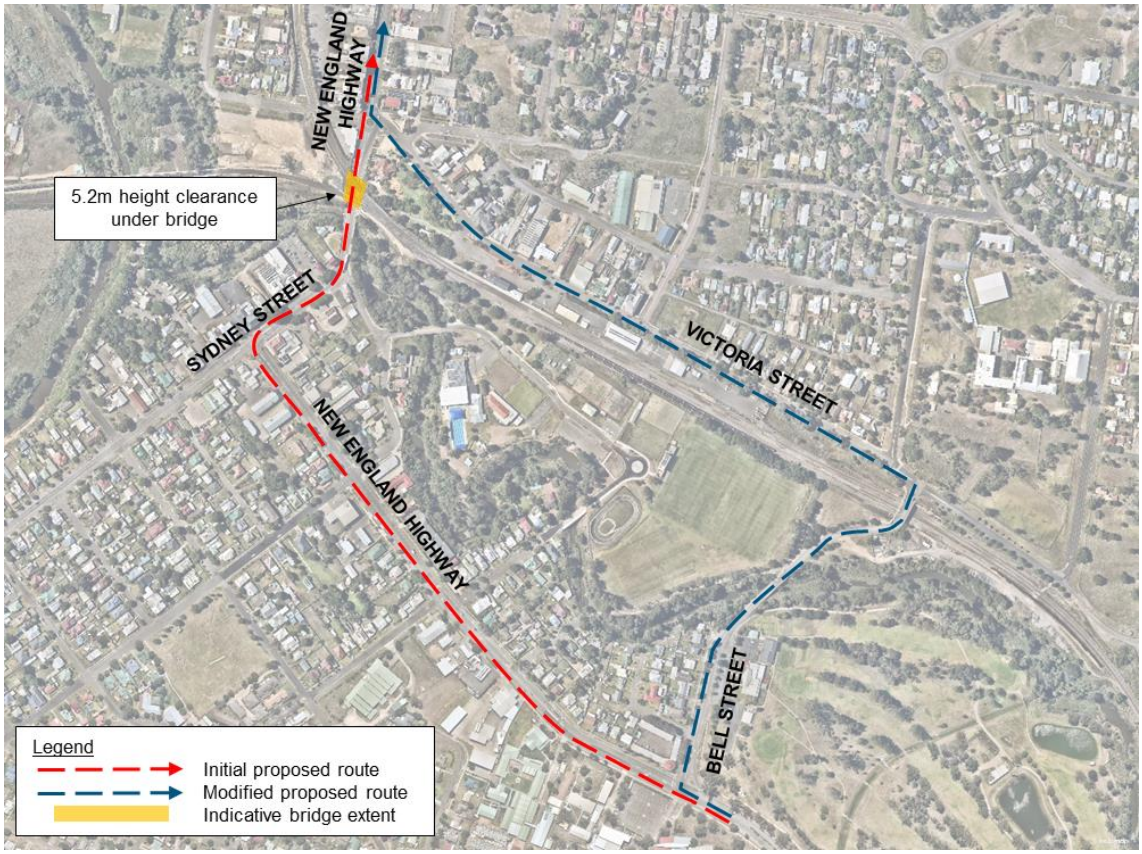
**Figure 7.1 – Potential OSOM route between the Port of Newcastle and the site**




Base image source: NHVR Route Planner Tool

Of note, near Muswellbrook town centre, Sydney Road is subject to a 5.2 metre height restriction under the railway overbridge. As such, a modification to the route is proposed, as shown in Figure 7.2, with travel along New England Highway, Bell Street and Victoria Street such that vehicles can travel over the railway line via the Bell Street Bridge. This modified route is already an approved 4.6m high vehicle route in the NSW Load Carrying Network Map and hence already assessed as an appropriate route modification by TfNSW.

**Figure 7.2 – Potential OSOM route through Muswellbrook**




Base image source: Nearmap

For the purposes of the SSDA, the route commences along Industrial Drive. The exact origin within Port of Newcastle is unknown however a review of the NSW Load Carrying Network Map indicates that roads connecting the port terminals to Industrial Drive are designed to accommodate a range of OSOM vehicles. Once the location where OSOM vehicles will be loaded with their components is confirmed, the OSOM travel route from port to Industrial Drive will be reviewed in more detail by the contractor during preparation of the TMP and following approval of the SSDA, in consultation with relevant stakeholders (Port Authority, NHVR, TfNSW and Council).

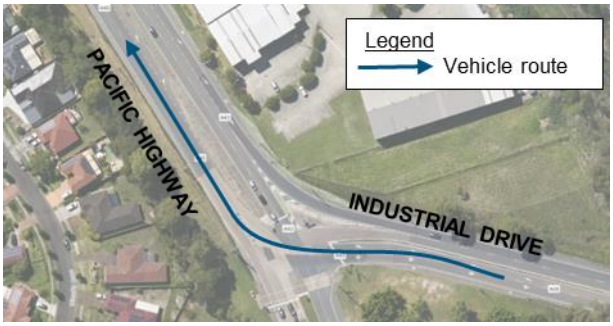
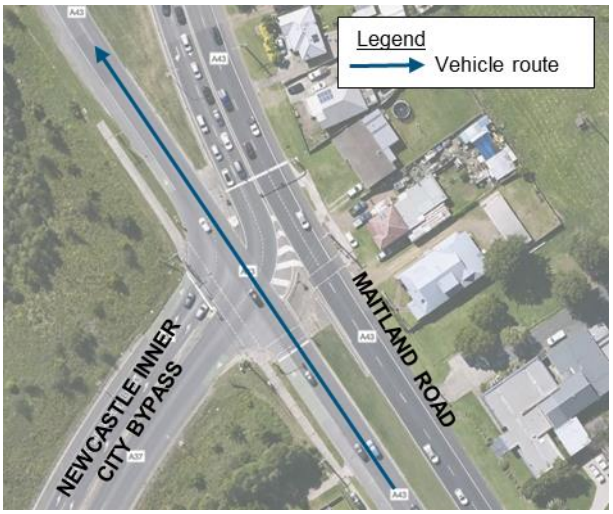
Each OSOM vehicle is designed to contract in size once the component is offloaded. As such, the review has been completed based on the origin-destination route from port to site only at times when the OSOM vehicle is fully laden.

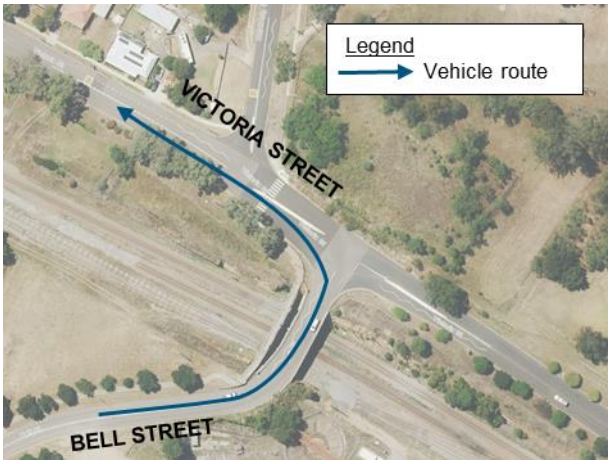
### 7.3.2 Route Analysis – Existing Road Network

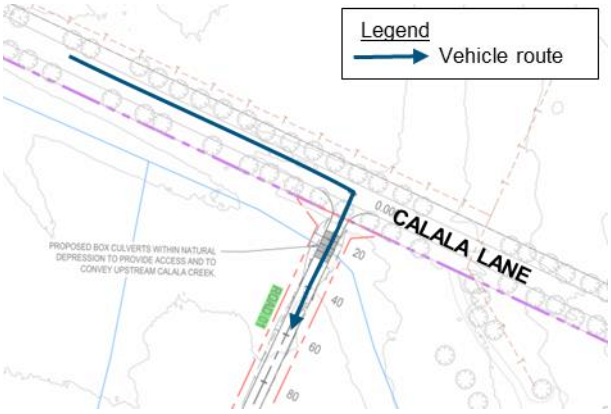
A review of the potential transport route indicates that there are several key locations where traffic management and/ or modification of existing traffic furniture would be required to accommodate vehicle manoeuvres. Swept paths through these key pinch points are included in Appendix B and illustrate the constraints and proposed mitigating works to accommodate the necessary OSOM vehicles.

A summary of the route analysis, including the key locations, proposed mitigations and additional steps to resolve route viability are presented in Table 7.1.

**Table 7.1 – Route analysis**

| Location | Image | Comment |
|---|---|---|
| **Industrial Drive/ Pacific Highway, Mayfield West** |  <br>  | • Need to confirm height clearances to power lines |
| **Maitland Road/ Newcastle Inner City Bypass, Sandgate** |  <br>  | • Need to confirm height clearances to power lines |

| Location | Image | Comment |
|---|---|---|
| **Bell Street/ Victoria Street, Muswellbrook** |  <br>  | • Potential need for vehicle to traverse median for left turn from Bell Street to Victoria Street<br>• Potential need for traffic management as vehicle is likely to cross onto opposing traffic lanes<br>• Need to confirm height clearances to power lines |
| **Victoria Street/ New England Highway, Muswellbrook** |  | • Potential need for traffic management as vehicle is likely to cross onto opposing traffic lanes to turn right from Victoria Street into New England Highway<br>• Likely need to trim vegetation on the Victoria Street median to accommodate vehicle manoeuvre |
| **New England Highway/ Calala Lane, South Tamworth** |  | Under the existing layout:<br>• there is a likely need to for the vehicle to traverse a median with the right turn from New England Highway onto Calala Lane, as well as the temporary removal of street furniture on the median. Furthermore, there is a potential need for traffic management as vehicle is likely to cross onto opposing traffic lanes.<br>Under the upgraded signalised layout:<br>• The preferred option involves the vehicle turning right into the opposing traffic lane on Calala Lane, subject to appropriate traffic management and escort vehicles.<br>• The alternative option involves the vehicle turning right into the correct traffic lane on Calala Lane, however resulting in the vehicle needing to traverse the median and hence the |

| Location | Image | Comment |
|---|---|---|
| |  | need for traffic lights to be temporarily removed during the turning movement<br>For both options:<br>• Need to confirm height clearances to power lines |
| **Calala Lane, Calala (west of site)** |  <br>  <br>  | • Need to confirm height clearances to power lines and tree canopies |
| **Site access** |  | • Likely need to widen access driveway to accommodate vehicle manoeuvres into and out of site |

A review of height clearance to power lines will be prepared by the transport contractor as part of the TMP. Should any low power lines be identified, these can typically be temporarily raised to allow over height vehicles through, noting this is a standard practice for such vehicle movements.

### 7.3.3 Route Analysis – Future Road Network Upgrades

**Goonoo Goonoo Road/ Calala Lane Intersection**

As discussed in Section 3.2, the Goonoo Goonoo Road duplication between Jack Smyth Drive and Calala Lane at the southern end of Tamworth includes conversion of the existing Goonoo Goonoo Road/ Calala Lane intersection from a roundabout to traffic signals.

The potential OSOM route may overlap with construction works along Goonoo Goonoo Road. Following consultation with Transport for NSW in October 2023, it is understood main works are not expected to commence until 2025/ 2026. As such, construction of the Goonoo Goonoo Road (New England Highway) duplication is unlikely to overlap with construction of the BESS.

It will naturally be critical that the contractor engages with all relevant stakeholders, including the contractors for the proposed road works, to understand whether there will be any overlap in construction programme and if so, to ensure appropriate coordination of OSOM vehicle movements to site. Given the minor quantum of OSOM vehicles (four), the vehicle movements can be programmed to arrive to site when an appropriate road carriageway is available along Goonoo Goonoo Road to accommodate the vehicles. Given the affected roads generally have a straight alignment with large road reserve including road shoulders on either side, it is expected the OSOM vehicle movements can be readily accommodated.

Vehicle swept paths have also been completed of the OSOM vehicle movements through the proposed Goonoo Goonoo Road/ Calala Lane intersection and included in Appendix B. The assessment indicates that the OSOM vehicles will be able to maneuver through the proposed intersection design in one of two ways, as detailed in Appendix B and Table 7.1:

- The preferred option involves the vehicle turning right into the opposing traffic lane on Calala Lane, subject to appropriate temporary traffic management and escort vehicles.
- The alternative option involves the vehicle turning right into the correct traffic lane on Calala Lane, however with the vehicle needing to partially traverse the median and impact traffic signal posts, these may need to be temporarily removed.

Notwithstanding, the actual intersection layout may be subject to an interim construction layout during the period when OSOM vehicles are proposed to navigate the intersection. As such, the OSOM travel route through this intersection will be reviewed in more detail by the contractor during preparation of the TMP and following approval of the SSDA, in consultation with relevant stakeholders (Council, TfNSW and relevant road works contractors).

It will naturally be critical that the contractor engages with all relevant stakeholders, including the contractors for the proposed road works, to ensure appropriate coordination of OSOM vehicle movements more generally through the active roadworks areas along Goonoo Goonoo Road and Calala Lane.

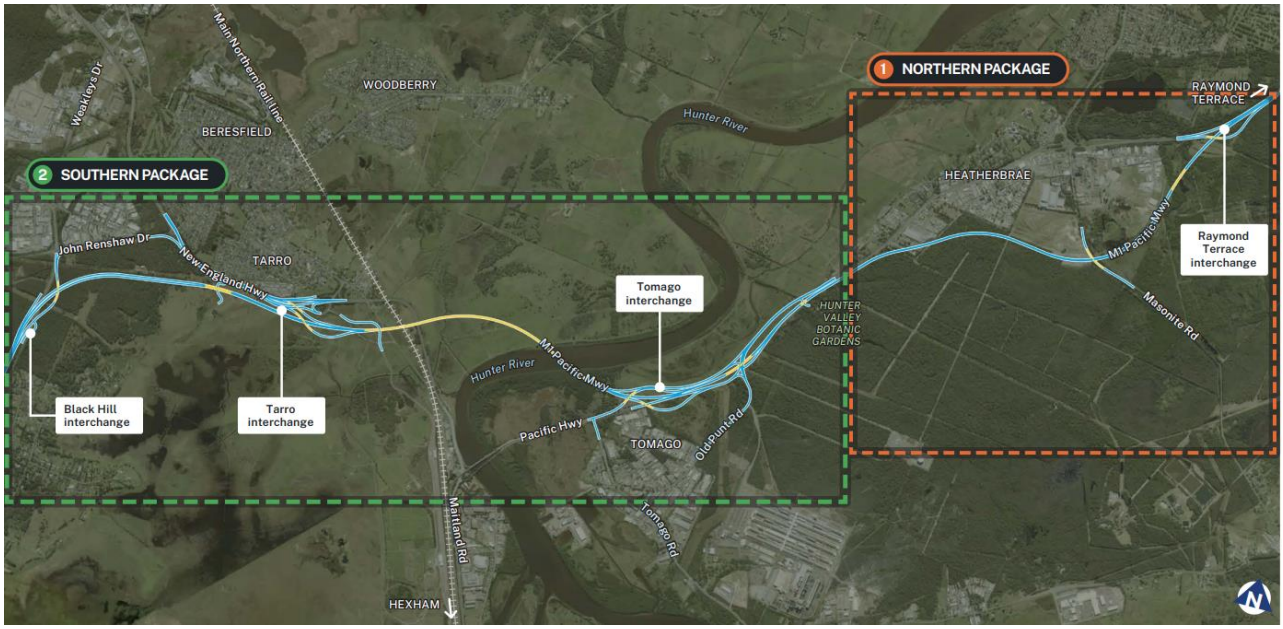
### M1 to Raymond Terrace Project (M12RT) and Pacific Highway improvements at Hexham

The M1 Pacific Motorway extension project is a major transport infrastructure project that will transform the way people move around the Hunter region while improving travel times and conditions for those travelling between Sydney and Brisbane. The project received approval on 13 February 2023 and includes the following upgrades as shown in Figure 7.3:

- 15 kilometres of dual carriageway motorway with two lanes in each direction, bypassing Hexham and Heatherbrae
- interchanges at Black Hill, Tarro, Tomago, and Raymond Terrace
- a 2.6 kilometre bridge over Woodlands Close, the Main Northern Railway, New England Highway and Hunter River
- minimum flood immunity along the new roadway for a one in 20 year event[2].

[2] M1 Pacific Motorway extension to Raymond Terrace | Transport for NSW, accessed July 2023

**Figure 7.3 – M1 Pacific Motorway extension to Raymond Terrace – Proposed Design**



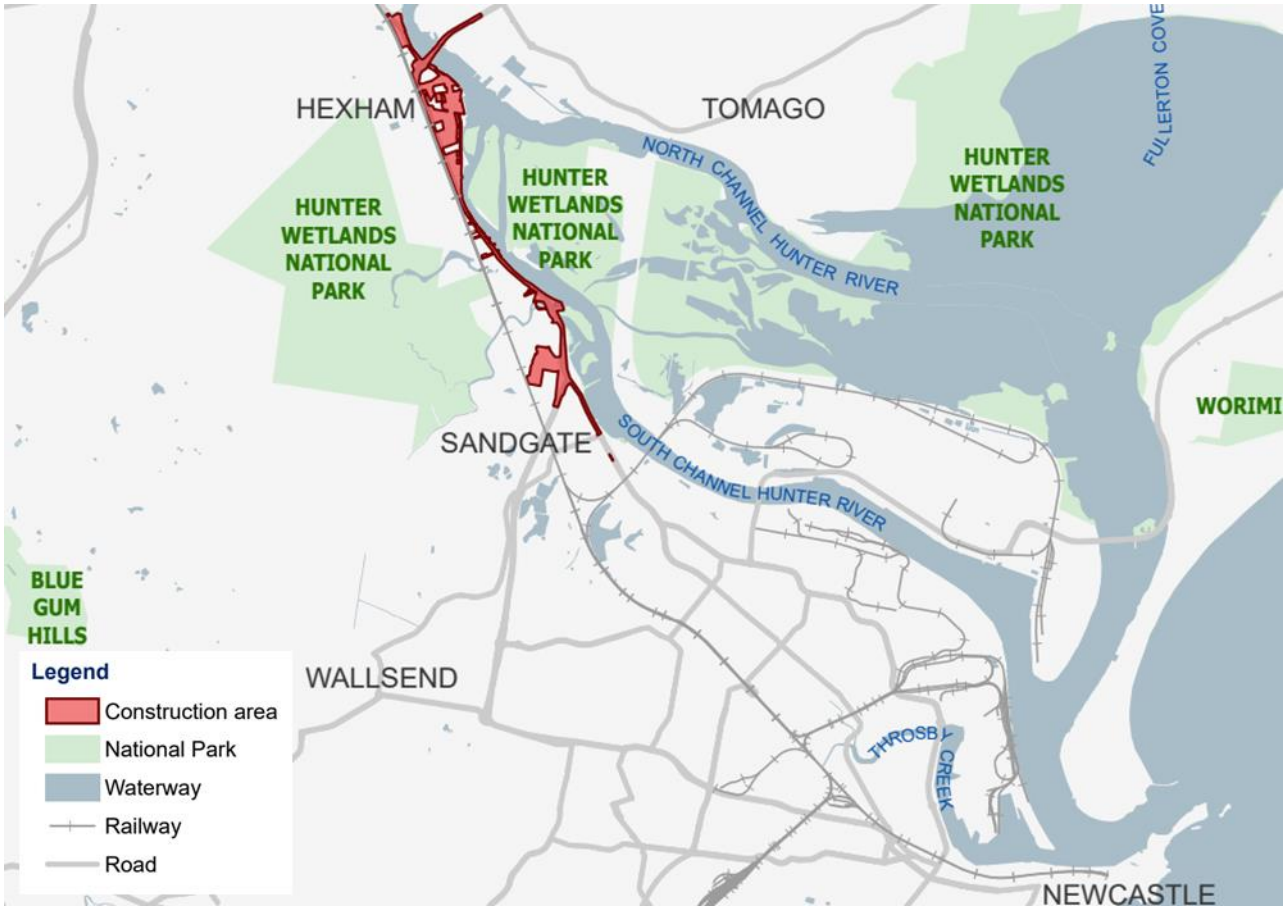

Source: Page 3, M1 Pacific Motorway extension to Raymond Terrace, Project Update, Transport for NSW, February 2023

Early works are expected to commence in 2023, with construction timelines unknown at this stage however also expected to overlap with construction of the proposed BESS. The potential OSOM route will overlap with construction works along New England Highway near Tarro.

TfNSW is also proposing to widen a six kilometre section of the Pacific Highway (Maitland Road) from four lanes to six lanes, starting about 290 metres south of the intersection with the Newcastle Inner City Bypass at Sandgate and extending through to about 760 metres north of Hexham Bridge in Hexham, as shown in Figure 7.4. The proposal would create two additional lanes in each direction and would include the replacement twin bridges across Ironbark Creek The section of road is known as the 'Hexham Straight'[3].

[3] Page iv, Hexham Straight Widening Review of Environment Factors, Transport for NSW, November 2021

**Figure 7.4 – Pacific Highway improvements at Hexham – Proposed Construction Area**




Source: Figure 1.1, Hexham Straight Widening Review of Environment Factors, Transport for NSW, November 2021

Major construction work is expected to start in 2023, with completion in 2026. The potential OSOM route will overlap with construction works along Pacific Highway (Maitland Road) between Sandgate and Hexham.

Both sets of road works are expected to generally maintain practical road carriageways with minimum two lanes in each direction on the key roads, including the Pacific Highway. As such, given the affected roads generally have a straight alignment and dual carriageway, it is expected the OSOM vehicle movements can be accommodated. Notwithstanding, should there be any impact to the viability of the route including short periods of reduced carriageway widths, given the minor quantum of OSOM vehicles (four), it is expected the OSOM vehicle movements can be programmed to arrive to site when an appropriate road layout is available through the active works areas. It will naturally be critical that the contractor engages with all relevant stakeholders, including the contractors for the proposed road works, to ensure appropriate coordination of OSOM vehicle movements through the active roadworks areas.

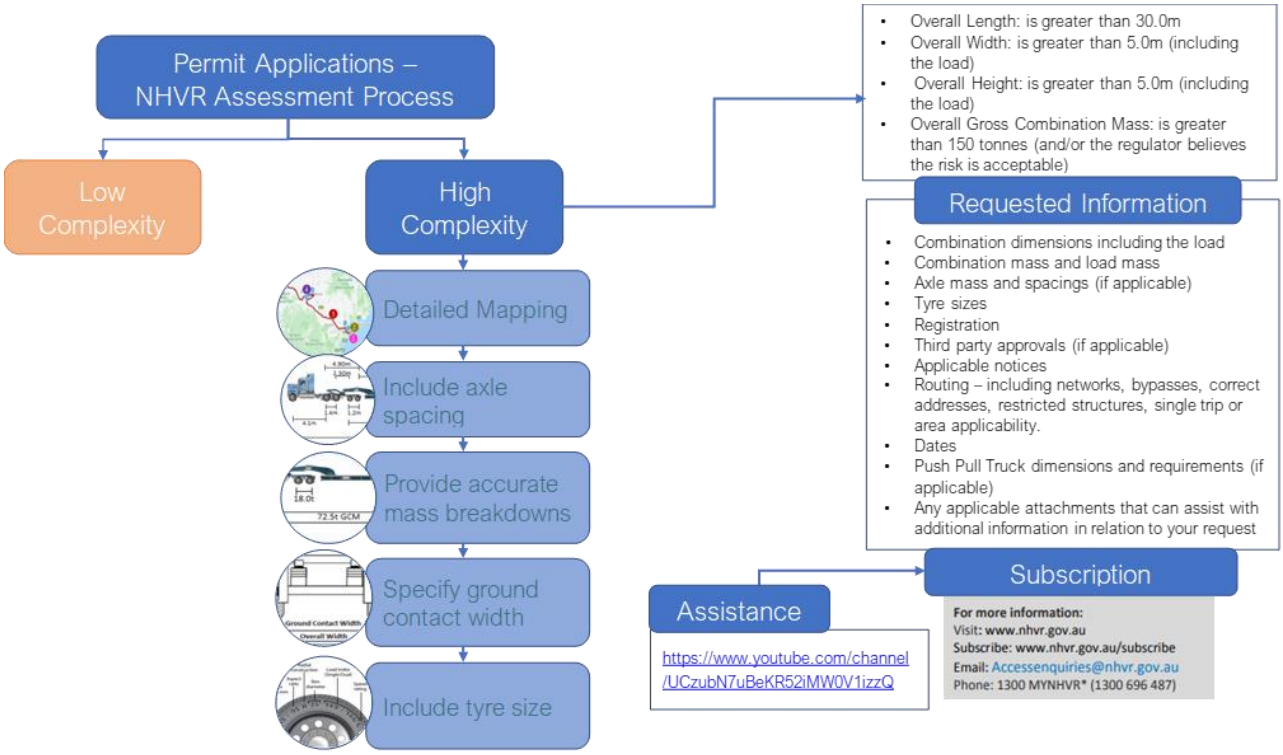
## 7.4 Route Approval

As discussed, the OSOM route would be subject to further review and finalisation following engagement of a contractor and subsequent preparation of the TMP (and following SSDA approval). All relevant requirements relating to OSOM vehicle movements will be detailed in the TMP, to be prepared as a required by the development consent conditions prior to construction and in consultation with all relevant stakeholders and approved by the Secretary of the NSW Department of Planning, Industry and Environment.

The process of obtaining permission to transport each OSOM component to site involves getting approval to access the Transport for NSW and Council road networks, as well as getting the required permits for road works to facilitate the manoeuvring of OSOM vehicles and their respective loads. These temporary road works are detailed in Table 7.1, however will be subject to further review during route refinement by the nominated contractor.

The process of gaining approval for OSOM vehicles to access the road network is facilitated through the National Heavy Vehicle Regulator. The permit application process is outlined in Figure 7.5.

**Figure 7.5 – Permit application process**




The National Heavy Vehicle Regulator will facilitate permit applications with Road Managers across TfNSW Special Permits Unit, Local Councils and Toll Road Operators. The National Heavy Vehicle Regulator has advised that the process will take at least 28 days for the permit process. They will contact all relevant stakeholders to review the submission materials and provide any comments and contents are required within 28 days. It should be noted that if any stakeholders require further reviews and/ or time, the stakeholder can request an extension of the initial 28-day period to a maximum six months.

# 8. Overview Construction Vehicle Code of Conduct

The following overview code of conduct will form part of Equis Energy requirements of the contractor, where the contractor is expected to comply with the code of conduct in full. It is Equis Energy's expectation that the Code of Conduct will be implemented for all traffic and transport construction activities associated with construction. The code of conduct will be revised by Equis Energy in conjunction with the contractor prior to commencement of on-site works for the project.

## 8.1 Driver's Code of Conduct

This overview code of conduct will be communicated to all site workers during the site induction process. Workers will be reminded of the requirements of the code of conduct regularly in toolbox meetings.

The code of conduct will be revised prior to commencement of on-site works and when required during construction works.

### 8.1.1 Travelling Speeds

All vehicles associated with the site are required to travel within the posted speed limits on public roads. In situations where driver's visibility and traffic safety on public roads is affected by weather related conditions such as heavy rainfall or fog, construction vehicles should reduce their speed limit until visibility and traffic safety has improved.

Vehicle tracking management systems will be used for all site-based vehicles during construction.

### 8.1.2 Haulage Routes and Timing of Transport

All large vehicles associated with the site will follow the designated heavy and OSOM vehicle routes in the surrounding area. A map of the haulage routes highlighting critical locations will be attached to the transport code of conduct. Any school zones and school bus routes corresponding to the transport routes will be marked on the route maps.

The contractor will complete the following measures to minimise impact on school bus routes:

- Details and times of school bus routes will form part of the site induction.
- Consultation will be ongoing with bus operators.
- If deemed necessary, an escort vehicle for the school bus will be provided.
- OSOM deliveries are subject to the contractor obtaining relevant approvals from stakeholders, including Transprot for NSW, various Councils, Port Authority and National Heavy Vehicle Regulator.

### 8.1.3 Safe Driving Practices

The operators of all vehicles associated with the site would maintain a high level of awareness and respect for all other road users. All on-site staff will receive a site induction, which will include details regarding the TMP to be prepared post approval of the development, and associated code of conduct. Regular toolbox meetings will be held to maintain awareness of required controls. Details of the traffic and access training and induction will focus on:

- Objectives of the TMP to be prepared by the Contractor.
- Performance goals.
- Mitigation measures required to be implemented.
- Traffic and access monitoring and reporting requirements.
- Incident investigation and response protocols.

Training is to be provided prior to start-up of any traffic and access related management tasks and updated if task, equipment or procedures are expected to, or have changed.

The following requirements would be adhered to at all times:

- Obey all laws and regulations.
- Do not drive whilst under the influence of alcohol, drugs, nor any medication which may affect ability to drive.
- Be medically fit to drive at all times and must inform site coordinators if they have any medical condition which may affect their ability to drive.

- Drive in a considerate manner at all times and respect the rights of others to use and share the road space.
- Report all vehicle defects to their employer. Serious defects must be corrected immediately, or an alternative vehicle supplied.
- Any vehicle crash or incident resulting in injury or significant damage to property must be reported to the police.
- Report any near misses.
- Always adhere to the site working hours.
- Only drive the construction vehicle when conducting works related to the project.
- Securely fasten and cover loads, as appropriate.
- Keep their vehicle clean and in good mechanical condition to reduce the environmental impact.
- Extra care should be taken when driving at dawn or dusk, being particularly watchful for wildlife.
- Vehicles must give way to pedestrians, public and school buses and emergency vehicles.

The transport contractor is to develop and implement a maintenance program for the heavy transport vehicles that is consistent with these safety requirements.

### 8.1.4 Heavy Vehicle Driver Fatigue

Fatigue is one of the biggest causes of crashes for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was therefore developed by the National Transport Commission and approved by Ministers from all States and Territories in February 2007. The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 and applies to trucks and truck combinations over 12 tonne gross vehicle mass (however there are Ministerial Exemption Notices that can apply). Under the law, industry has the choice of operating under three fatigue management schemes:

- Standard hours of operation.
- Basic fatigue management.
- Advanced fatigue management.

Equis Energy and the contractor will be responsible to ensure all heavy vehicle drivers operating out of the site are to be aware of and understand the adopted fatigue management scheme and operate within its requirements.

### 8.1.5 Maintenance Requirements

The operators of all vehicles associated with the site would maintain a high level of maintenance. The following requirements would be adhered to at all times:

- Ensure their vehicle complies with relevant State legislation in relation to roadworthiness and modifications.
- Undergo regular vehicle checks and maintenance.
- Ensure their vehicles have correctly fitted mufflers to minimise noise disturbance.

### 8.1.6 Complaint Resolution and Disciplinary Procedure

All traffic related complaints will be managed in accordance with the Complaints Handling Procedure to be prepared by Equis Energy during preparation of the TMP post approval.

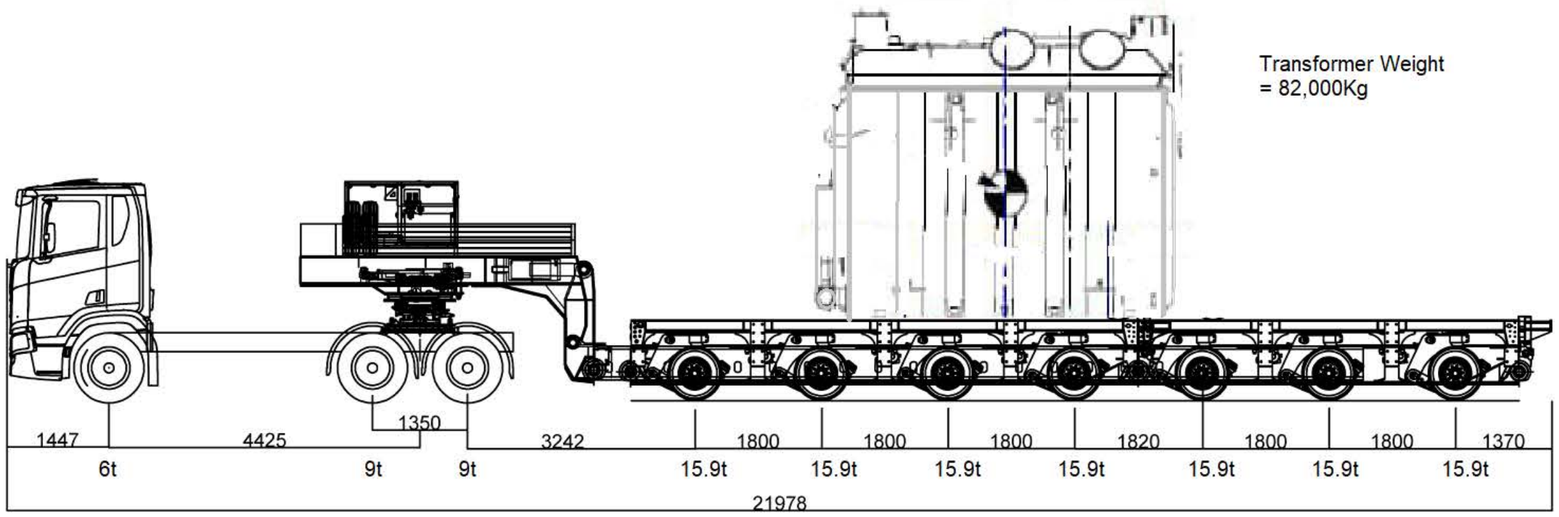
Failure to comply with these procedures for safe transport may result in disciplinary action. Vehicle tracking will be used to follow-up on any complaints lodged.

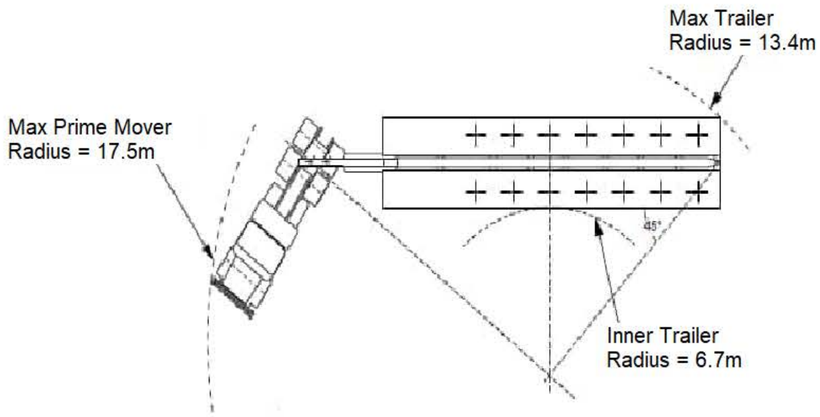
# 9. Conclusion

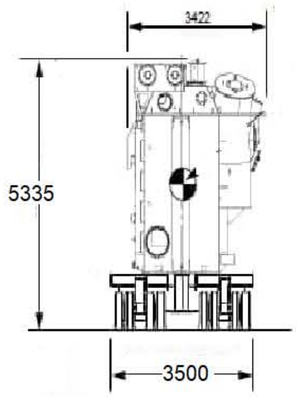
The following conclusions are made based on the analysis and discussions presented within this report:

- The proposal seeks approval for the construction and operation of a large-scale Battery Energy Storage System (BESS) located at 57 Burgess Lane Calala also known as 474 Calala Lane, Calala.
- Key transport elements of the proposal include a new site access from Calala Lane, internal access roads and minor quantum of on-site parking.
- The site will be operated remotely hence there will be no permanent on-site staff.
- With no permanent on-site staff only a minor quantum of on-site parking is required for use by maintenance vehicles as required, and the site is expected to generate low traffic volumes of up to one to two vehicles per day.
- The proposed site access point has been assessed and determined to satisfy relevant sight distance requirements.
- It is expected that typically, construction vehicle activity will result in 67 vehicles (one-way) per day, comprising around 60 light vehicles and seven trucks. Peak construction is expected to result in up to 465 construction vehicles (one-way) per day, comprising around 85 light vehicles and 380 trucks.
- The anticipated typical construction vehicle traffic generation is considered minor in comparison to the daily traffic volumes along Calala Lane and the State and Regional roads intended to be used to construct the project and is not anticipated to adversely affect the safety or function of the surrounding road network.
- During peak construction activity, Calala Lane will continue to operate at a desirable Level of Service C and and Goonoo Goonoo Road will continue to operate at an acceptable Level of Service D during the peak weekday hour period in the 2025 growth year scenario. As such, there is adequate capacity in the surrounding road network to cater for the construction traffic generated by the proposed development.
- A Traffic Management Plan will be completed by the nominated contractor prior commencement of construction, as required by the development consent conditions. It is critical that the contractor engages with all relevant stakeholders, including the contractors for proposed road works along Goonoo Goonoo Road and near Port of Newcastle, to ensure appropriate coordination of construction activities and to maintain safety for all users of the road network at all times.
- Four Over Size and Over Mass vehicles will be required for the delivery of components to site.
- An Over Size and Over Mass vehicle route analysis has been completed from Port of Newcastle to site, indicating an appropriate route is available subject to minor road network mitigations and appropriate traffic management. The route will be subject to further review and finalisation following engagement of a contractor and subsequent preparation of the Transport Management Plan.
- Overall, the proposal is expected to have a manageable impact on the surrounding road network during construction and can be supported from a traffic and transport perspective.

# Appendix A. OSOM Vehicle Specifications

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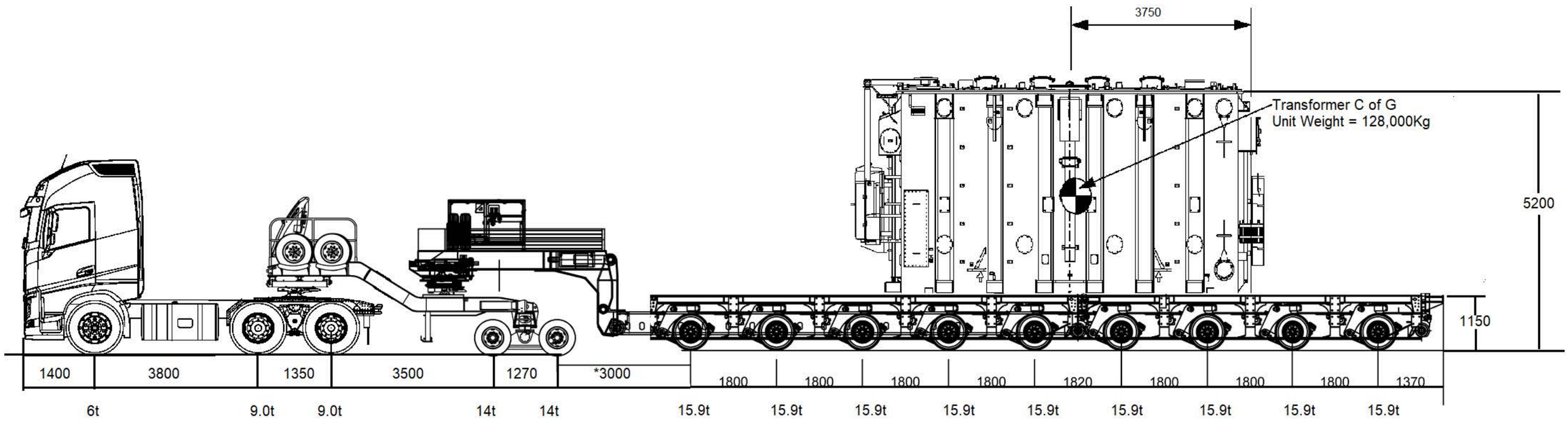
Title: EQUIS
7R8 Platform / Transformer

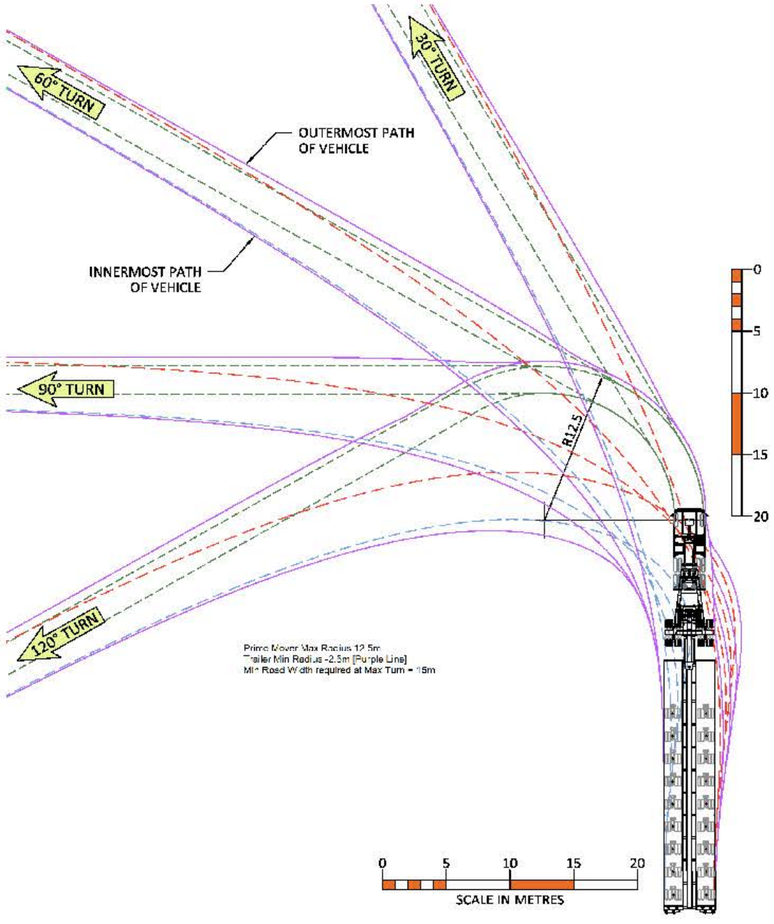
A3

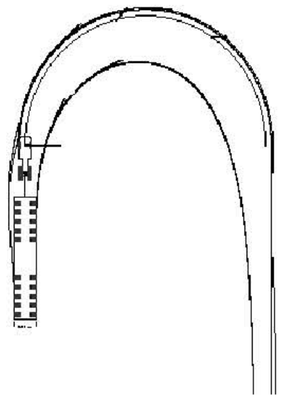
DATE: 4 July 2023

Rev



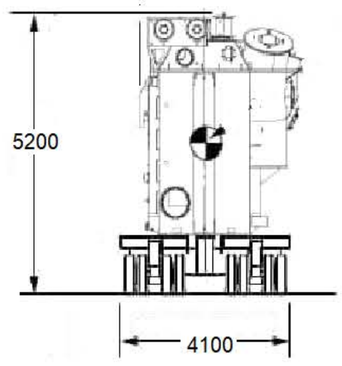

NOTE:
Axle Weights & Vehicle Dimensions may alter with Make / Model / Capacity & Brand of Truck / Trailer



25m

15m Minimum Road Width
[**NOT Including 1m Tolerance either side of vehicle]

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A3

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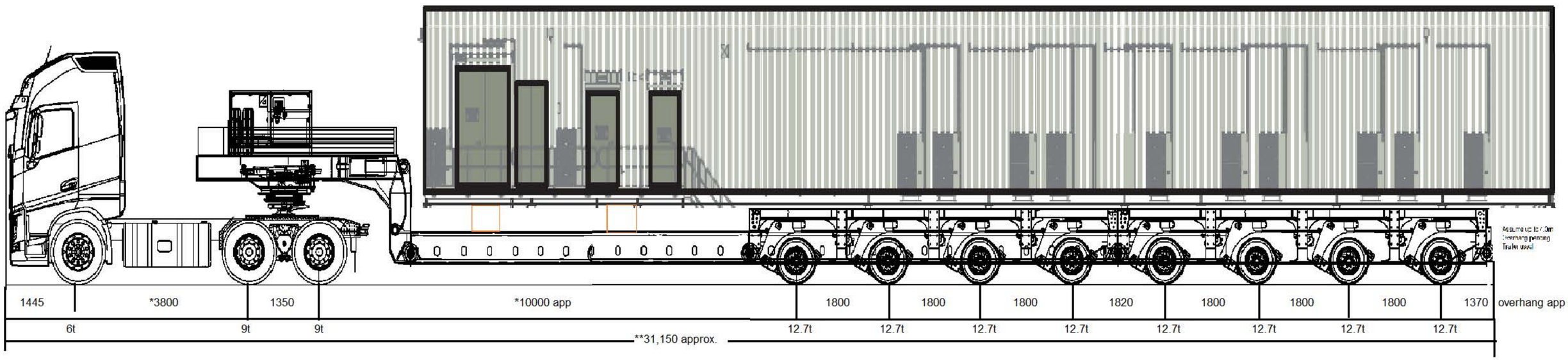


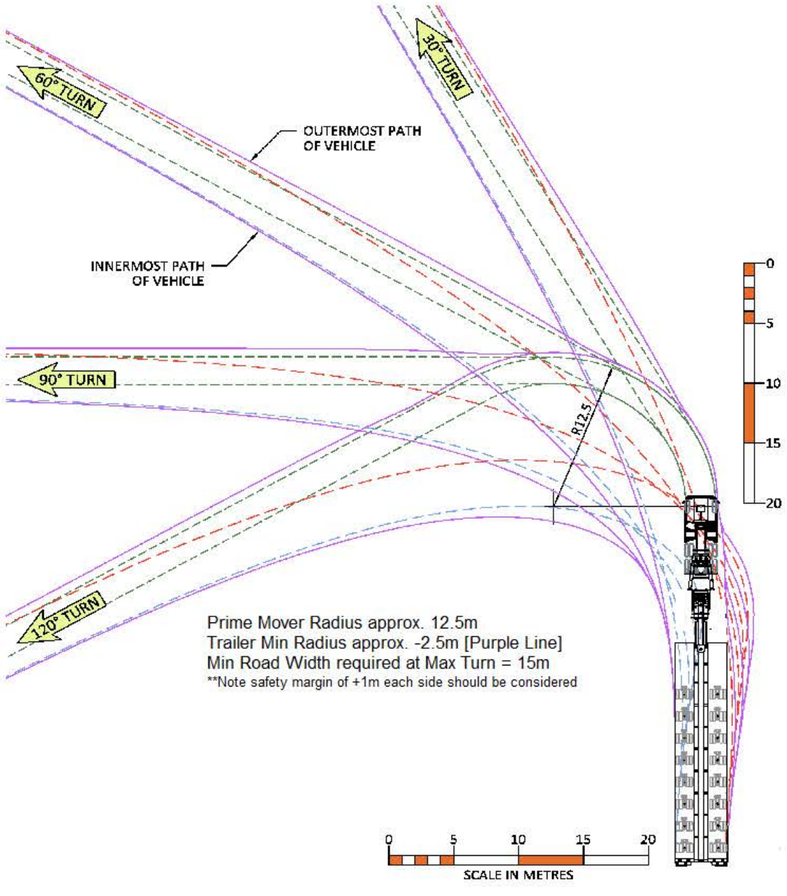


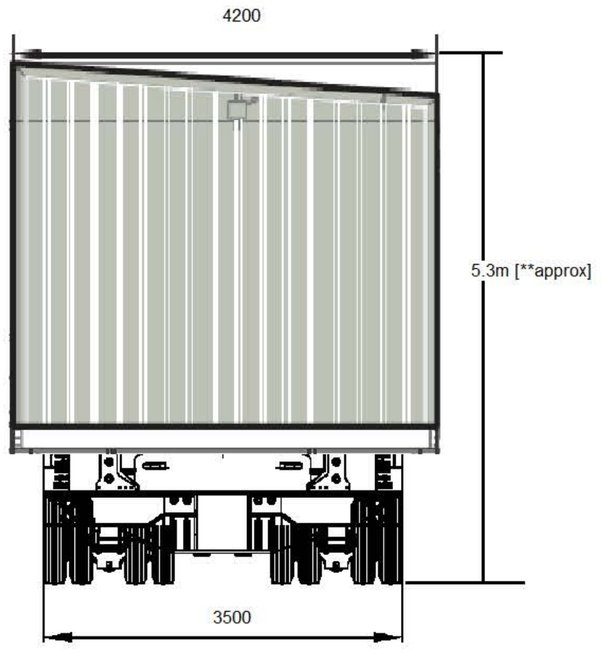


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A3

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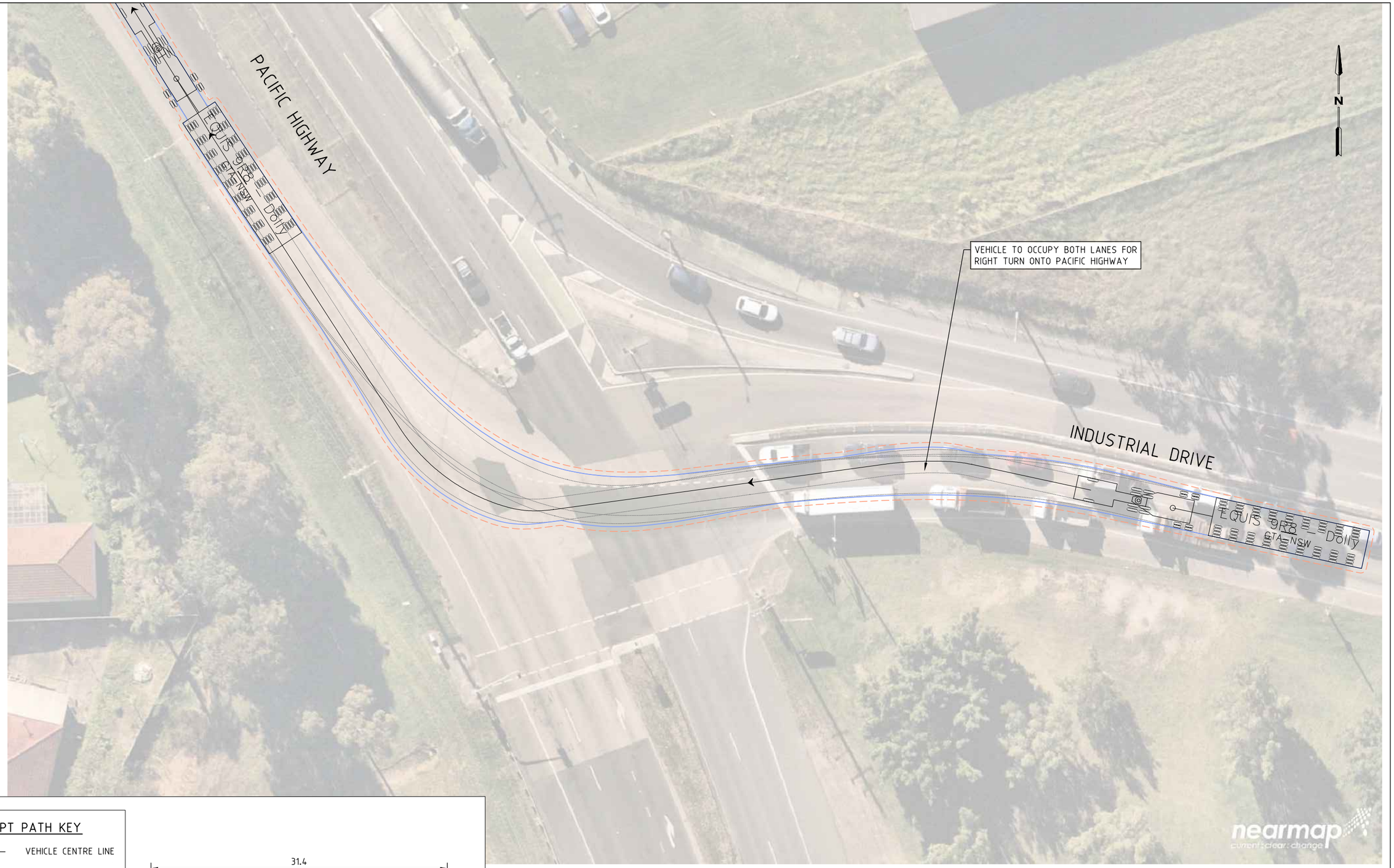
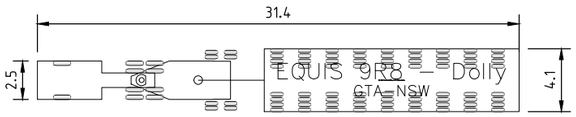
# Appendix B. OSOM Route Analysis and Swept Path Assessment




## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




AERIAL IMAGERY FROM NEARMAP
DATED 22.05.2023

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| | |
|---|---|
| DESIGNED W.XIE | DESIGN CHECK R.HAZELL |
| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

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CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

INDUSTRIAL DR/ PACIFIC HWY, MAYFIELD WEST
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-01 SHEET 01 OF 13 ISSUE P1

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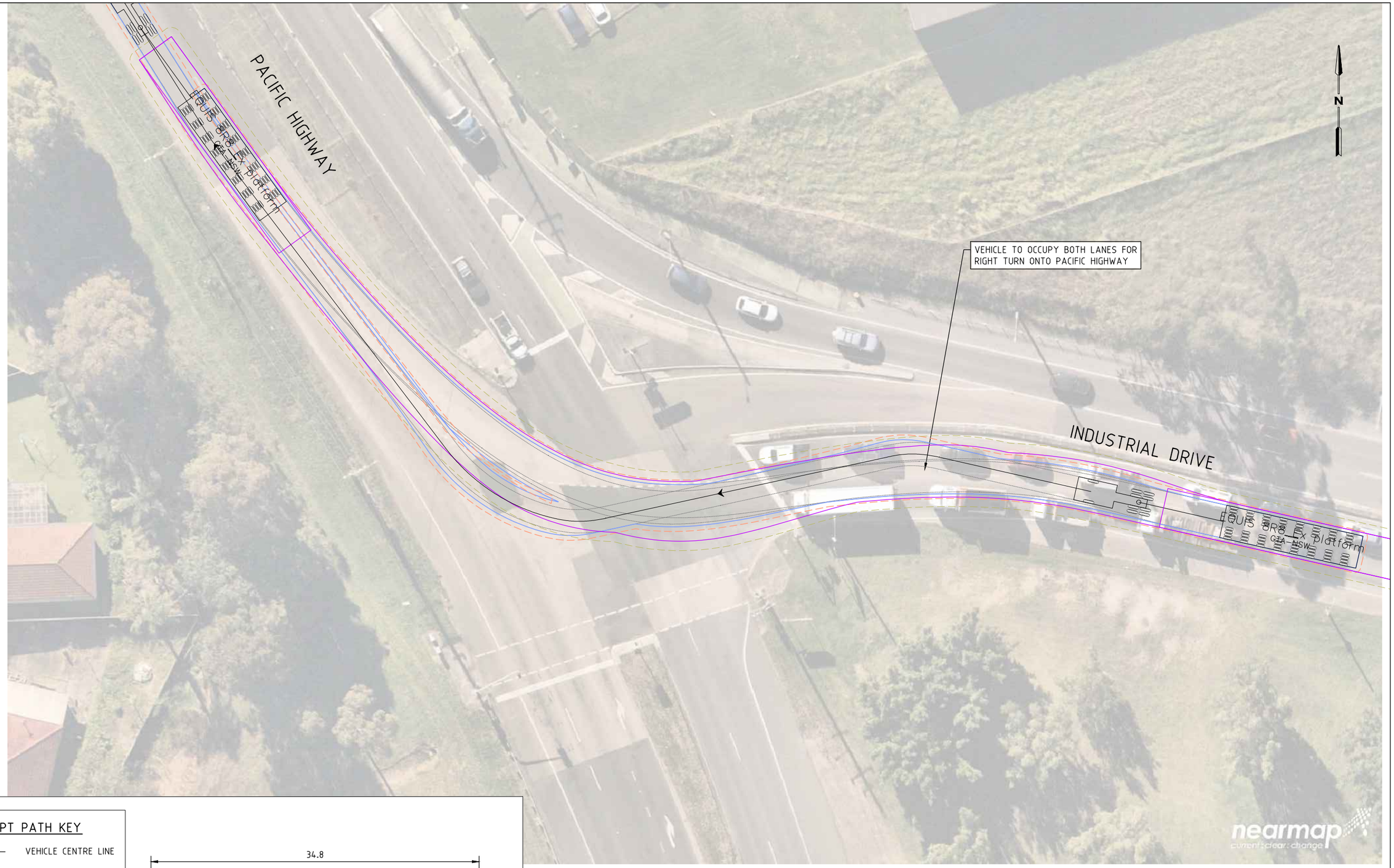
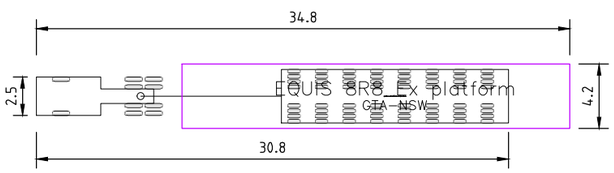



## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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| DESIGNED W.XIE | DESIGN CHECK R.HAZELL |
| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2 4 8 1:400

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

INDUSTRIAL DR/ PACIFIC HWY, MAYFIELD WEST
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-02 SHEET 02 OF 13 ISSUE P1

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## SWEPT PATH KEY

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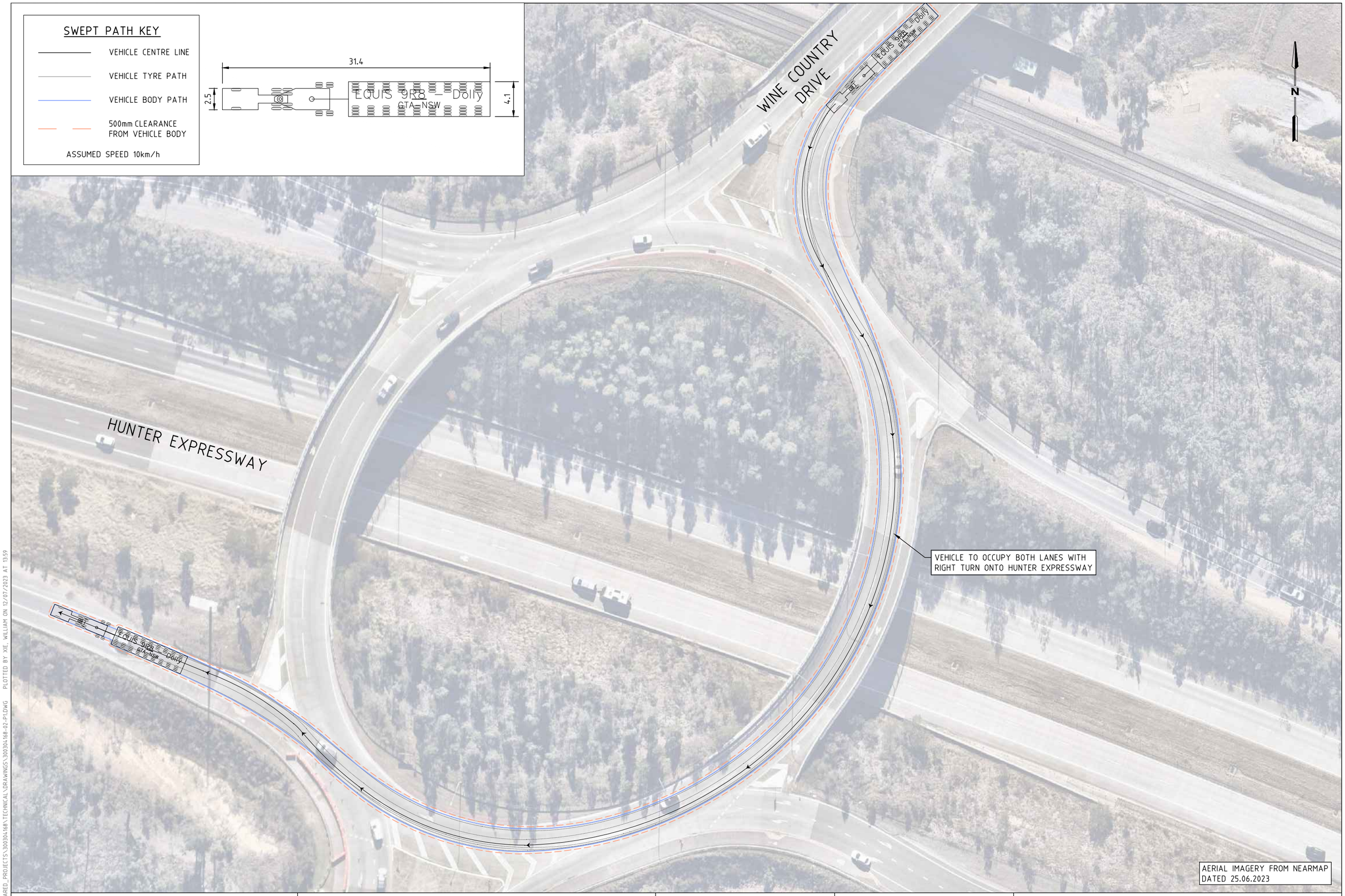
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




\\AU2019-PFFS01\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-02-P1.DWG PLOTTED BY XIE, WILLIAM ON 12/07/2023 AT 1359

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FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

**WARNING**
BEWARE OF UNDERGROUND SERVICES
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|---|---|
| DESIGNED W.XIE | DESIGN CHECK R.HAZELL |
| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |
| SCALE A3 - N/A | CAD FILE NO. 300304168-02-P1.DWG |

CALALA BESS

WINE COUNTRY DR/ HUNTER EXPRESSWAY, GRETA
VEHICLE SWEPT PATH ASSESSMENT

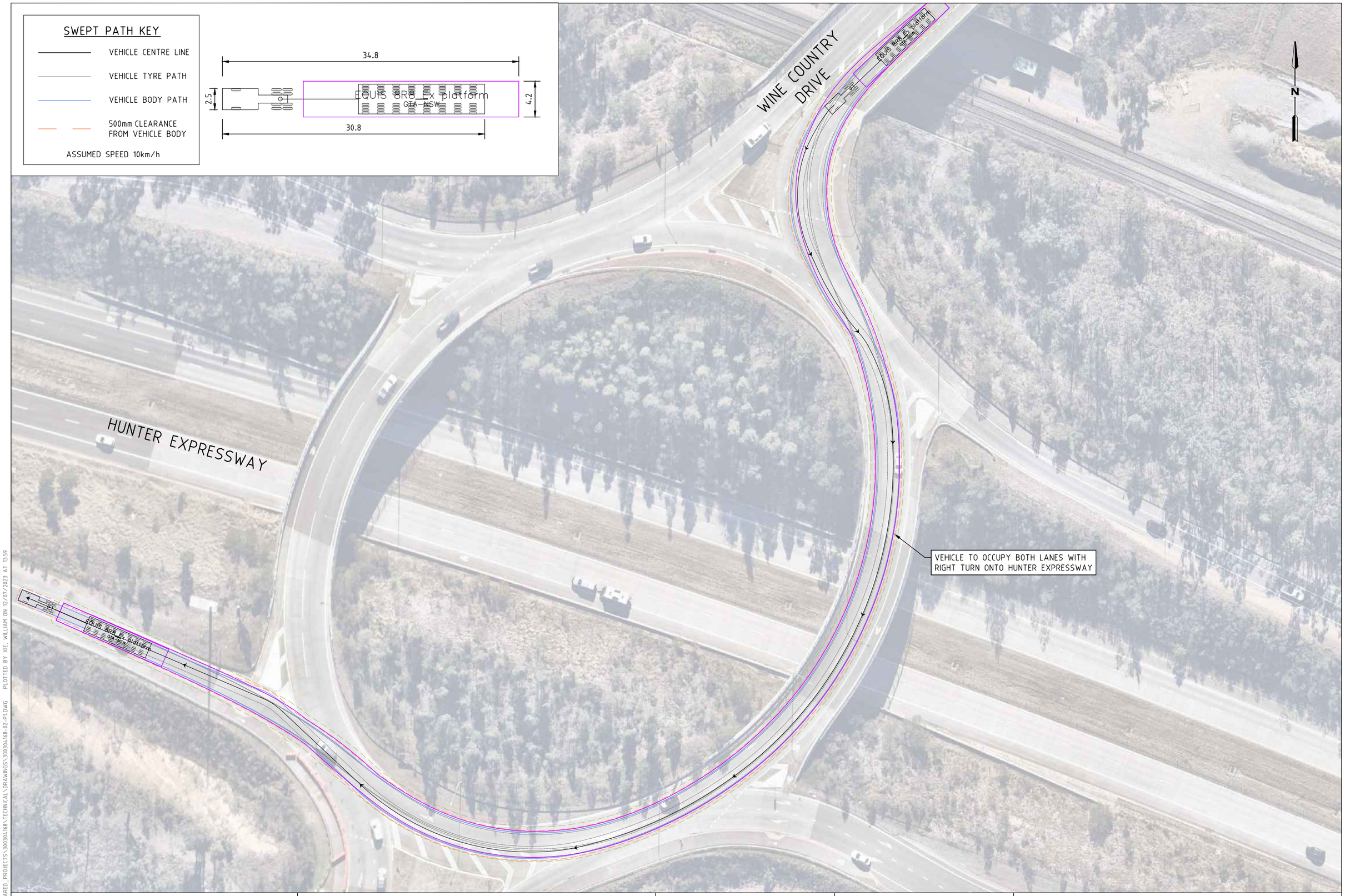
DRAWING NO. 300304168-02-03 SHEET 03 OF 13 ISSUE P1

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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| | | | |
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| DESIGNED W.XIE | DESIGN CHECK R.HAZELL | SCALE A3 - N/A | CALALA BESS |
| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 | CAD FILE NO. 300304168-02-P1.DWG | WINE COUNTRY DR/ HUNTER EXPRESSWAY, GRETA VEHICLE SWEPT PATH ASSESSMENT |
| | | | DRAWING NO. 300304168-02-04 SHEET 04 OF 13 ISSUE P1 |

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## SWEPT PATH KEY

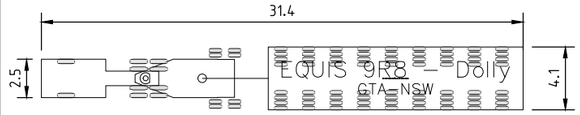
VEHICLE CENTRE LINE

VEHICLE TYRE PATH

VEHICLE BODY PATH

500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




BELL STREET

NEW ENGLAND HIGHWAY

VEHICLE TO OCCUPY MULTIPLE TRAFFIC LANES FOR RIGHT TURN ONTO BELL STREET

N

AERIAL IMAGERY FROM NEARMAP DATED 12.02.2023

\\AU2019-PFS01\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-02-P1.DWG PLOTTED BY XIE, WILLIAM ON 12/07/2023 AT 13:59

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| DESIGNED W.XIE | DESIGN CHECK R.HAZELL |
| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

NEW ENGLAND HWY/ BELL ST, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

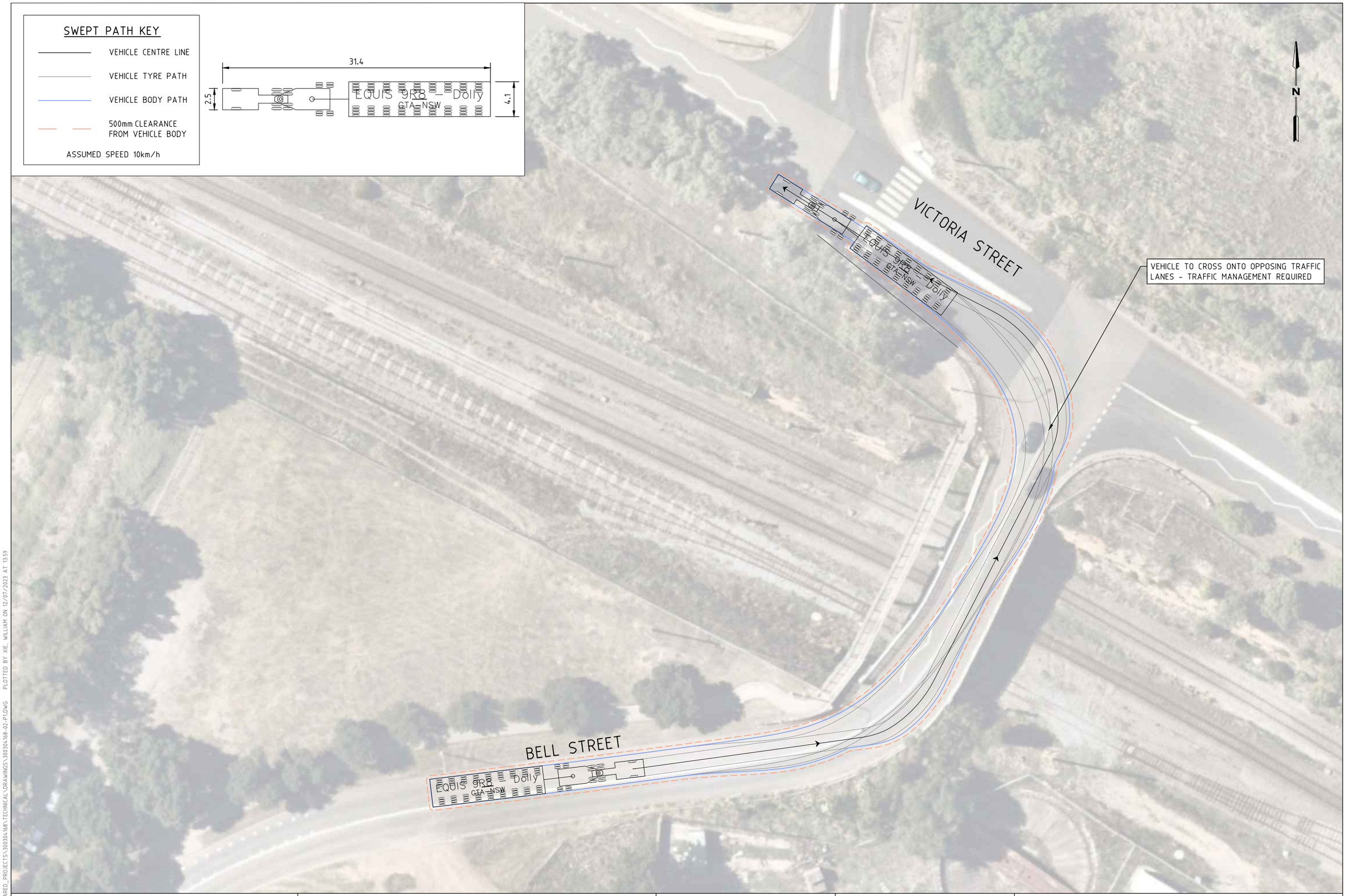
DRAWING NO. 300304168-02-05 SHEET 05 OF 13 ISSUE P1

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

BELL ST/ VICTORIA ST, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-06 SHEET 06 OF 13 ISSUE P1

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## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h





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| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

VICTORIA ST/ NEW ENGLAND HWY, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-07 SHEET 07 OF 13 ISSUE P1

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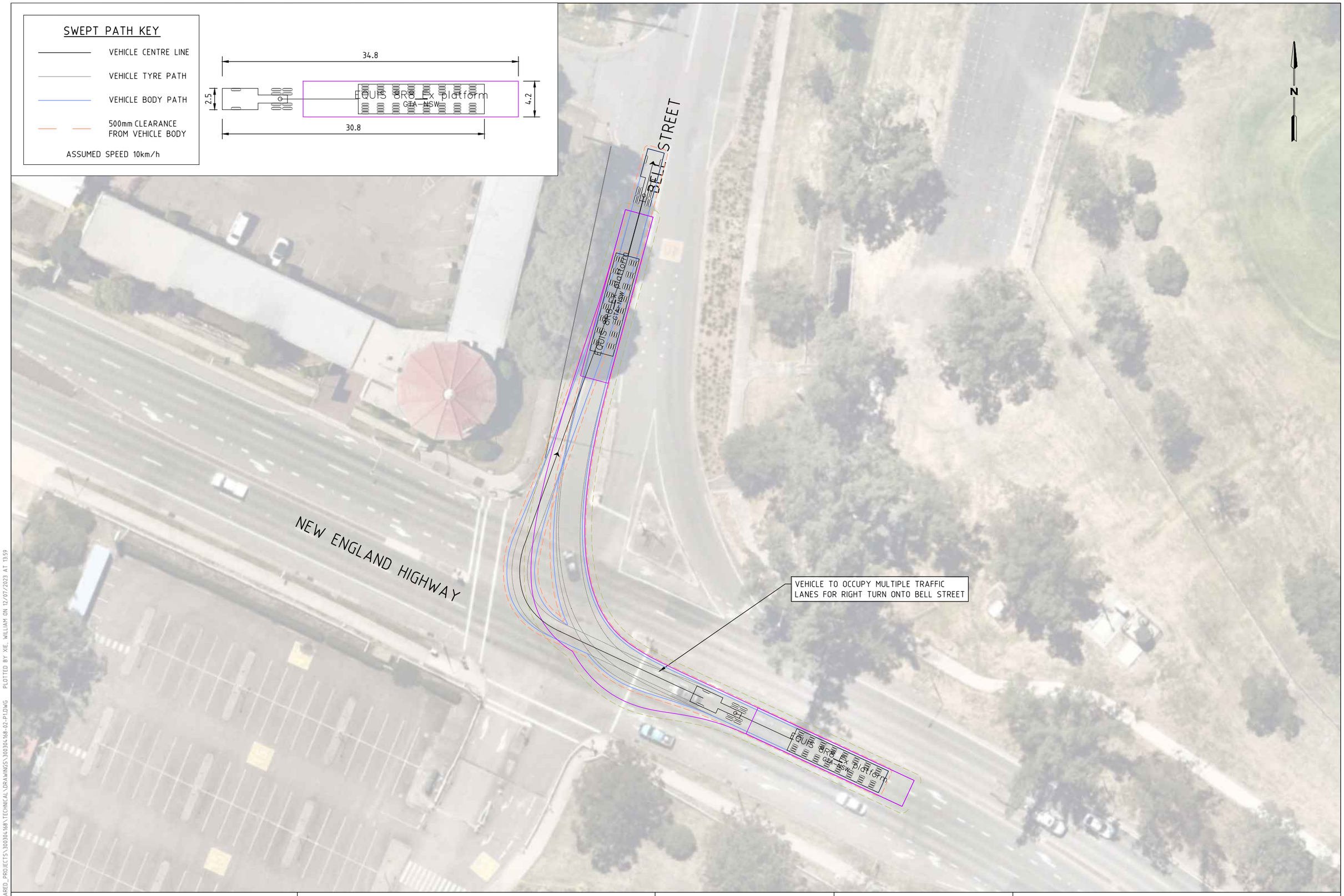
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

NEW ENGLAND HWY/ BELL ST, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-08 SHEET 08 OF 13 ISSUE P1

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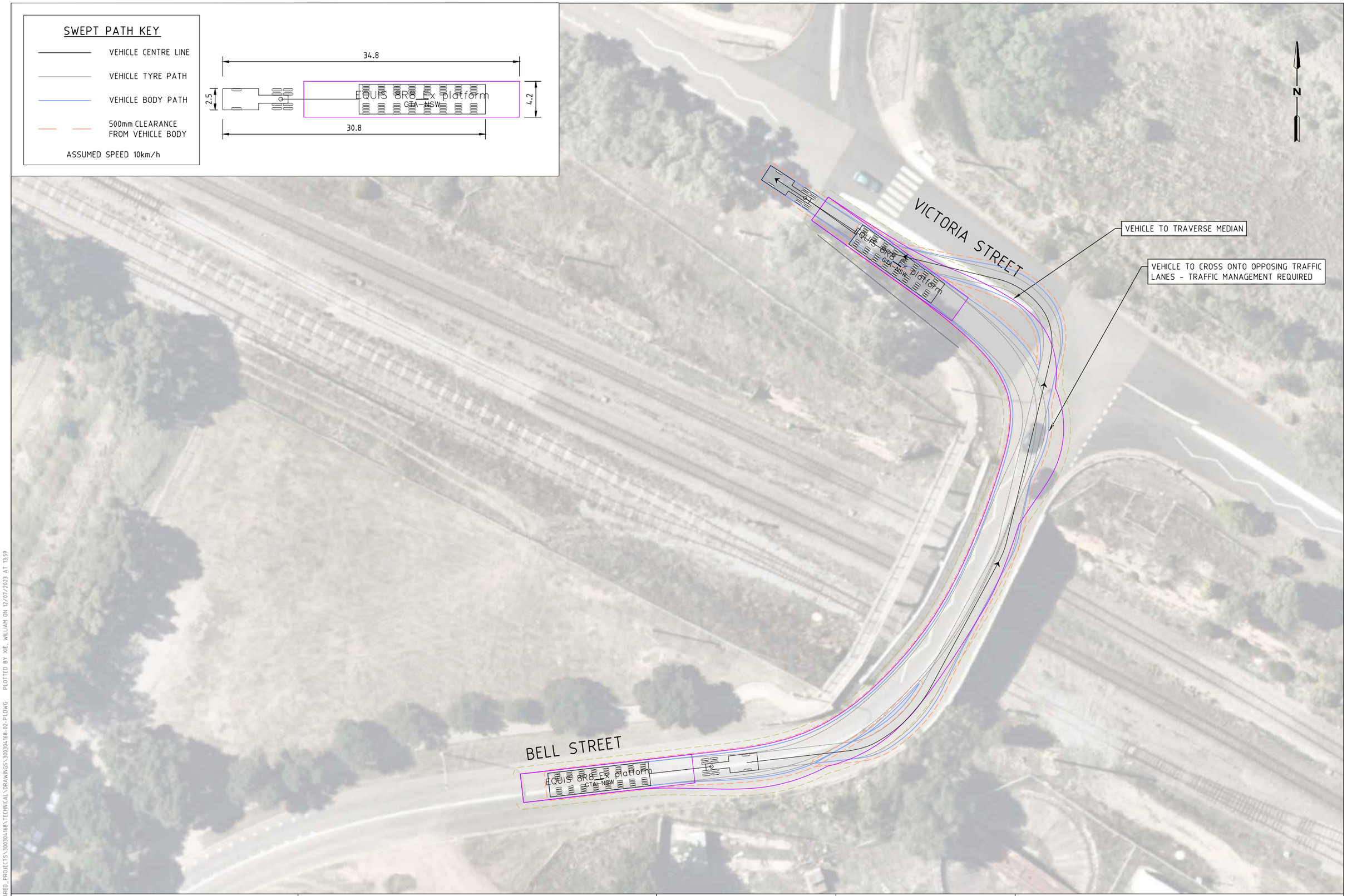
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

BELL ST/ VICTORIA ST, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-09 SHEET 09 OF 13 ISSUE P1

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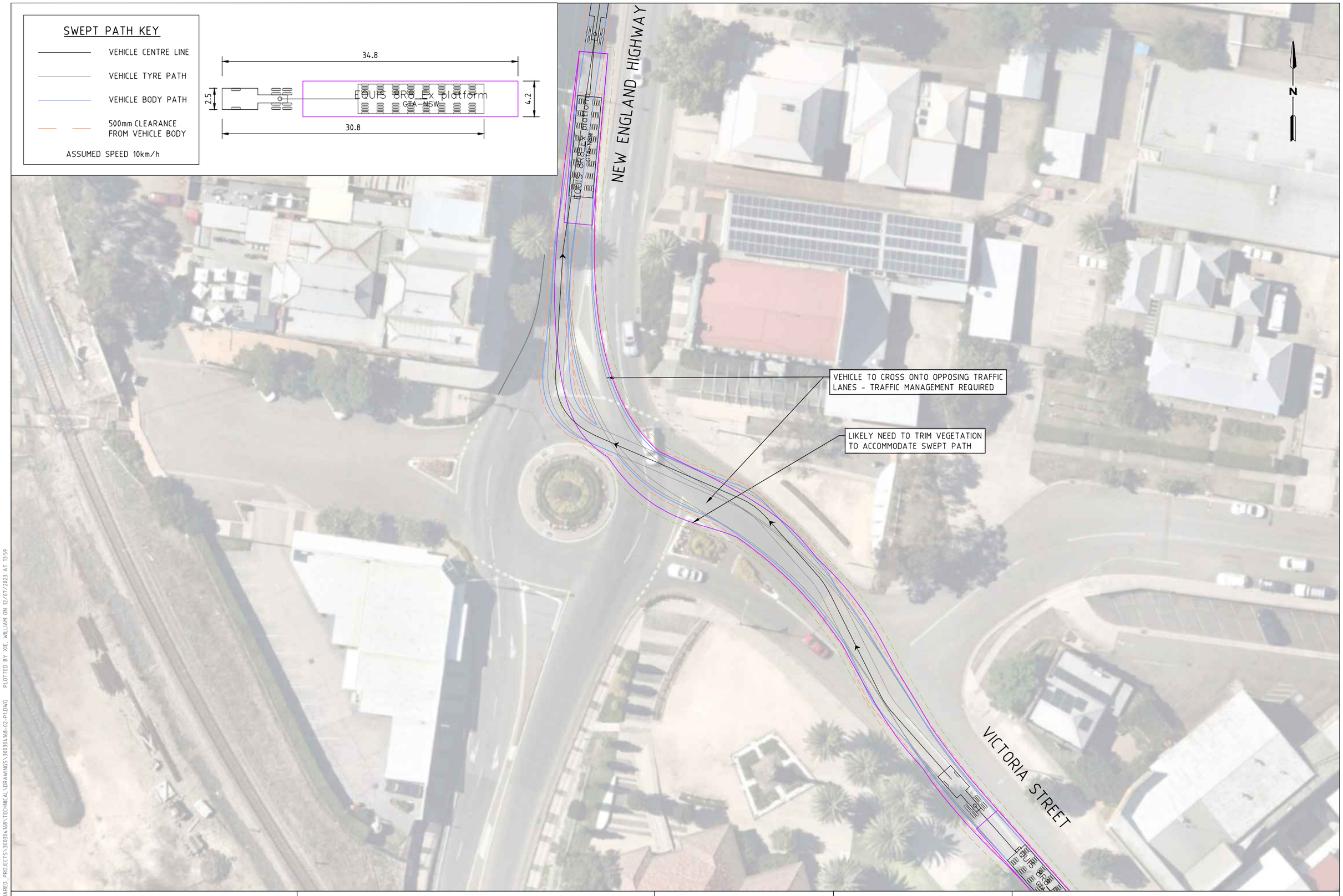
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

VICTORIA ST/ NEW ENGLAND HWY, MUSWELLBROOK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-10 SHEET 10 OF 13 ISSUE P1

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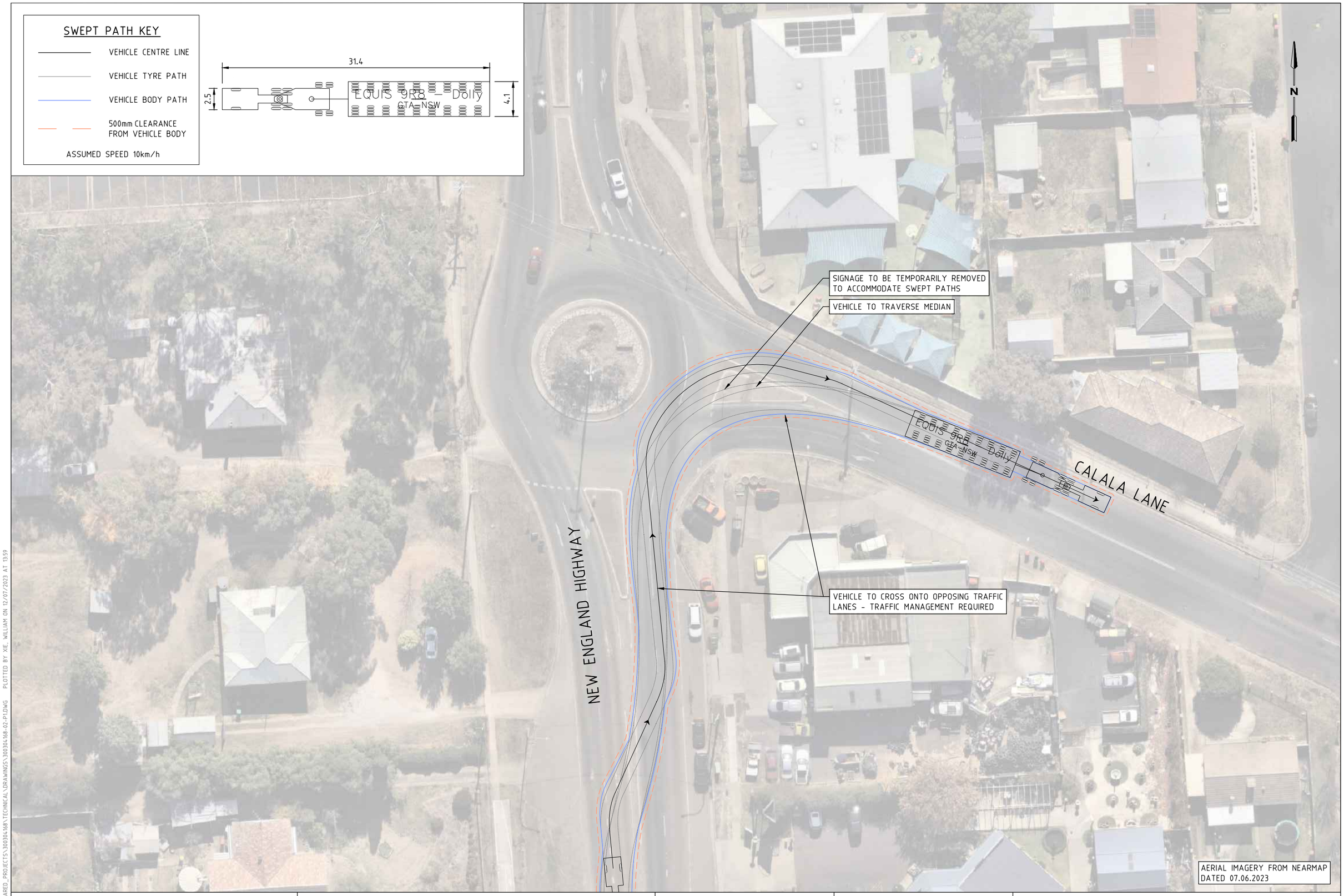
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-11 SHEET 11 OF 13 ISSUE P1

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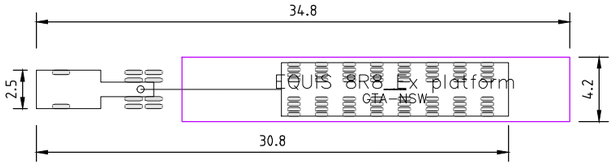
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




SIGNAGE TO BE TEMPORARILY REMOVED TO ACCOMMODATE SWEPT PATHS

VEHICLE TO TRAVERSE MEDIAN

VEHICLE TO CROSS ONTO OPPOSING TRAFFIC LANES - TRAFFIC MANAGEMENT REQUIRED

CALALA LANE

NEW ENGLAND HIGHWAY

N

\\AU2019-PPFS501\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-02-P1.DWG PLOTTED BY XIE, WILLIAM ON 12/07/2023 AT 13:59

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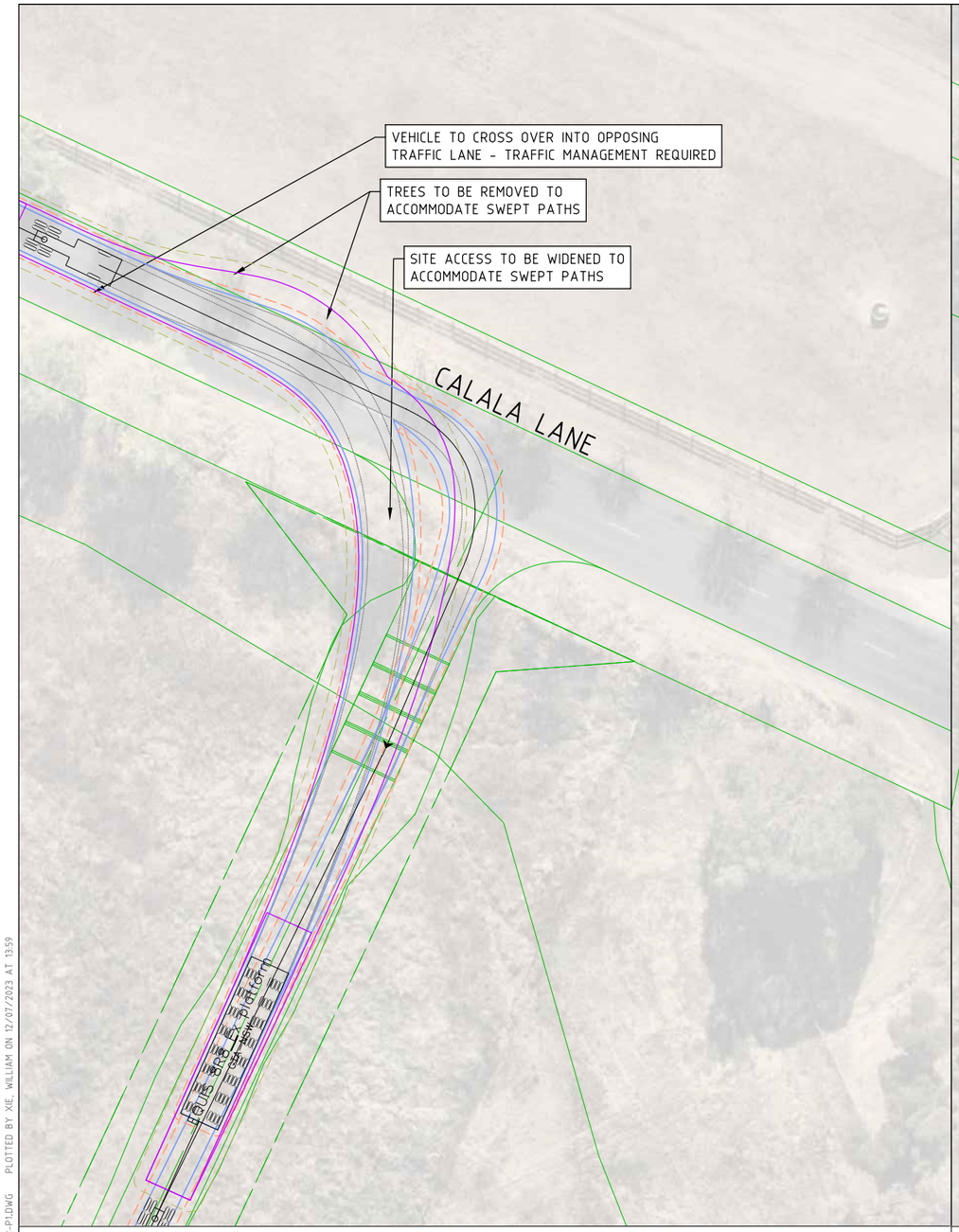
SCALE A3 0 2.5 5 10 1:500

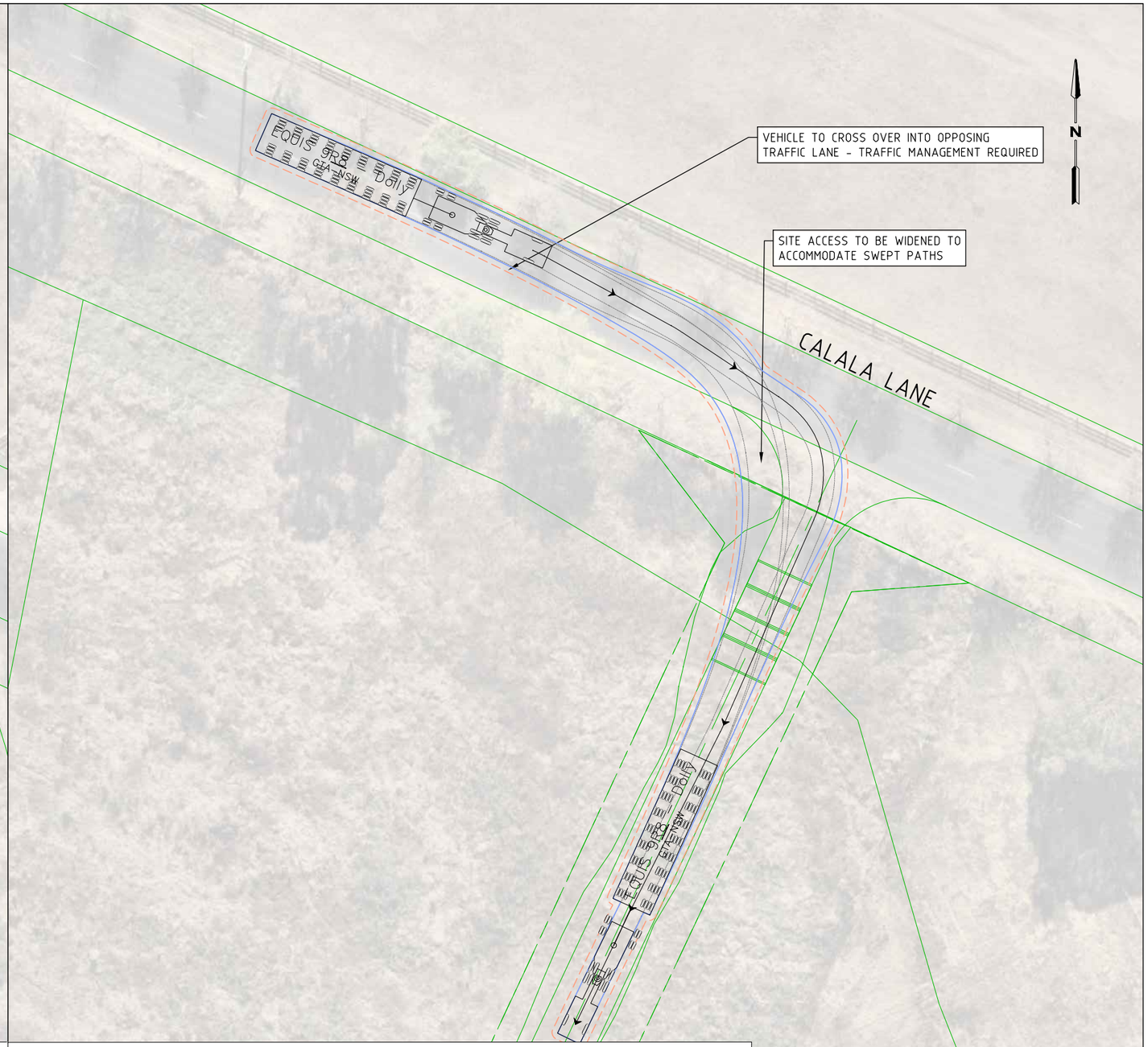
CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-12 SHEET 12 OF 13 ISSUE P1

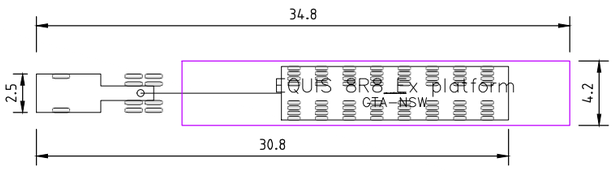



## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

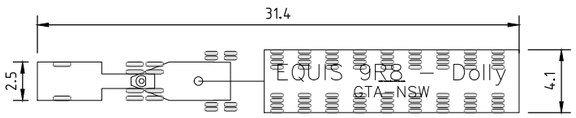
ASSUMED SPEED 5km/h




## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




CIVIL BASE IN GREEN
DRAWING SY22-086-0-X-DESIGN.dwg
REVISION P2
BY SKY ENGINEERING & PROJECT MANAGEMENT
DATED 23.06.2023

AERIAL IMAGERY FROM NEARMAP
DATED 07.06.2023

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| APPROVED BY R.HAZELL | DATE ISSUED 12 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-02-P1.DWG

CALALA BESS

SITE ACCESS - CALALA LANE, CALALA
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-13 SHEET 13 OF 13 ISSUE P1

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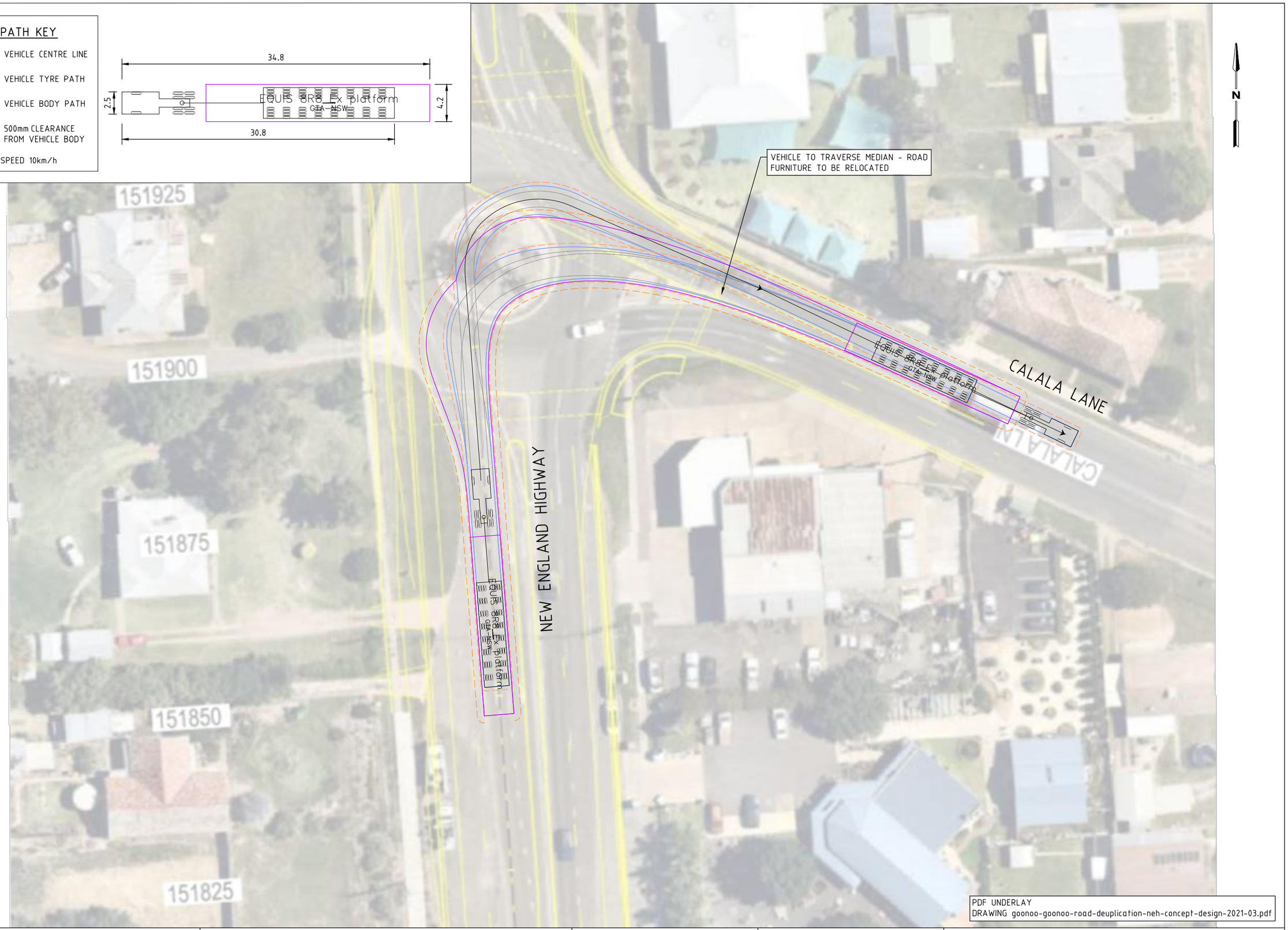
## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




PDF UNDERLAY
DRAWING goonoo-goonoo-road-deuplication-neh-concept-design-2021-03.pdf

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| APPROVED BY R.HAZELL | DATE ISSUED 13 JULY 2023 |

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-03-P1.DWG

# CALALA BESS
# UPGRADED SIGNALISED INTERSECTION
# NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
# VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-01 SHEET 01 OF 04 ISSUE P1

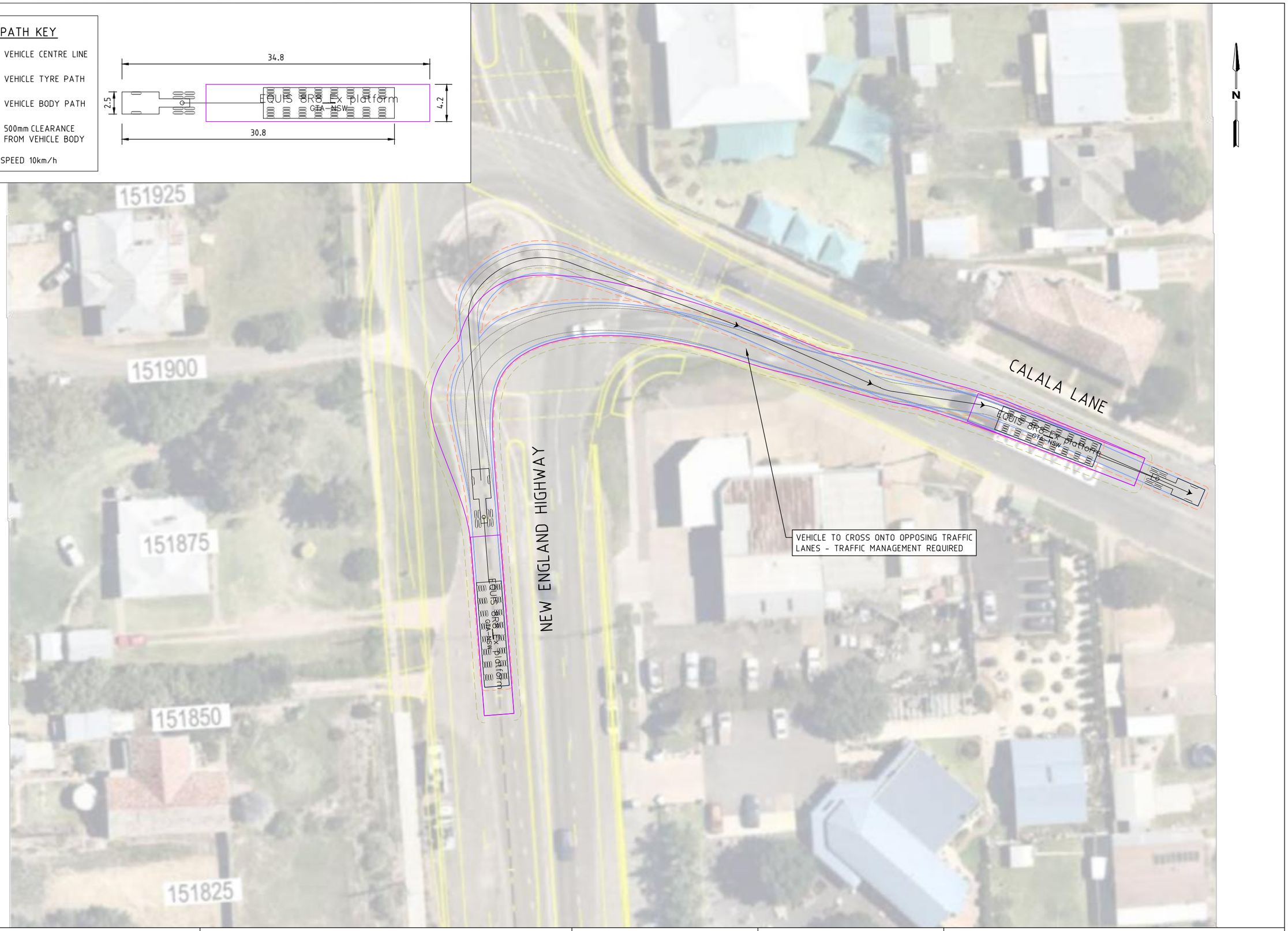
\\AU2019-PPFSS01\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 13/07/2023 AT 12:33

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-03-P1.DWG

# CALALA BESS
# UPGRADED SIGNALISED INTERSECTION
# NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
# VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-02 SHEET 02 OF 04 ISSUE P1

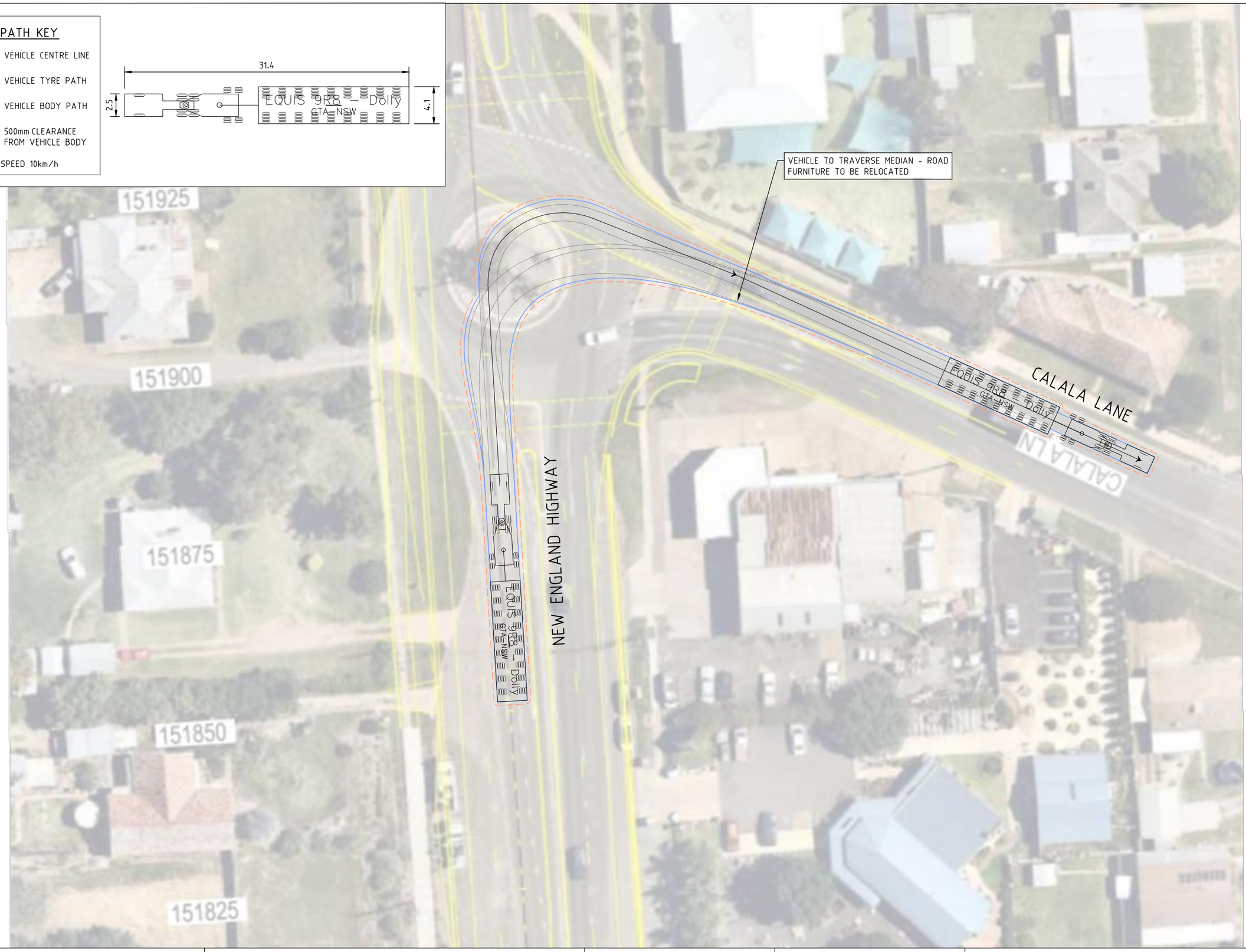
\\AU2019-PPFS501\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 13/07/2023 AT 12:34

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 300304168-03-P1.DWG

# CALALA BESS
# UPGRADED SIGNALISED INTERSECTION
# NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
# VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-03 SHEET 03 OF 04 ISSUE P1

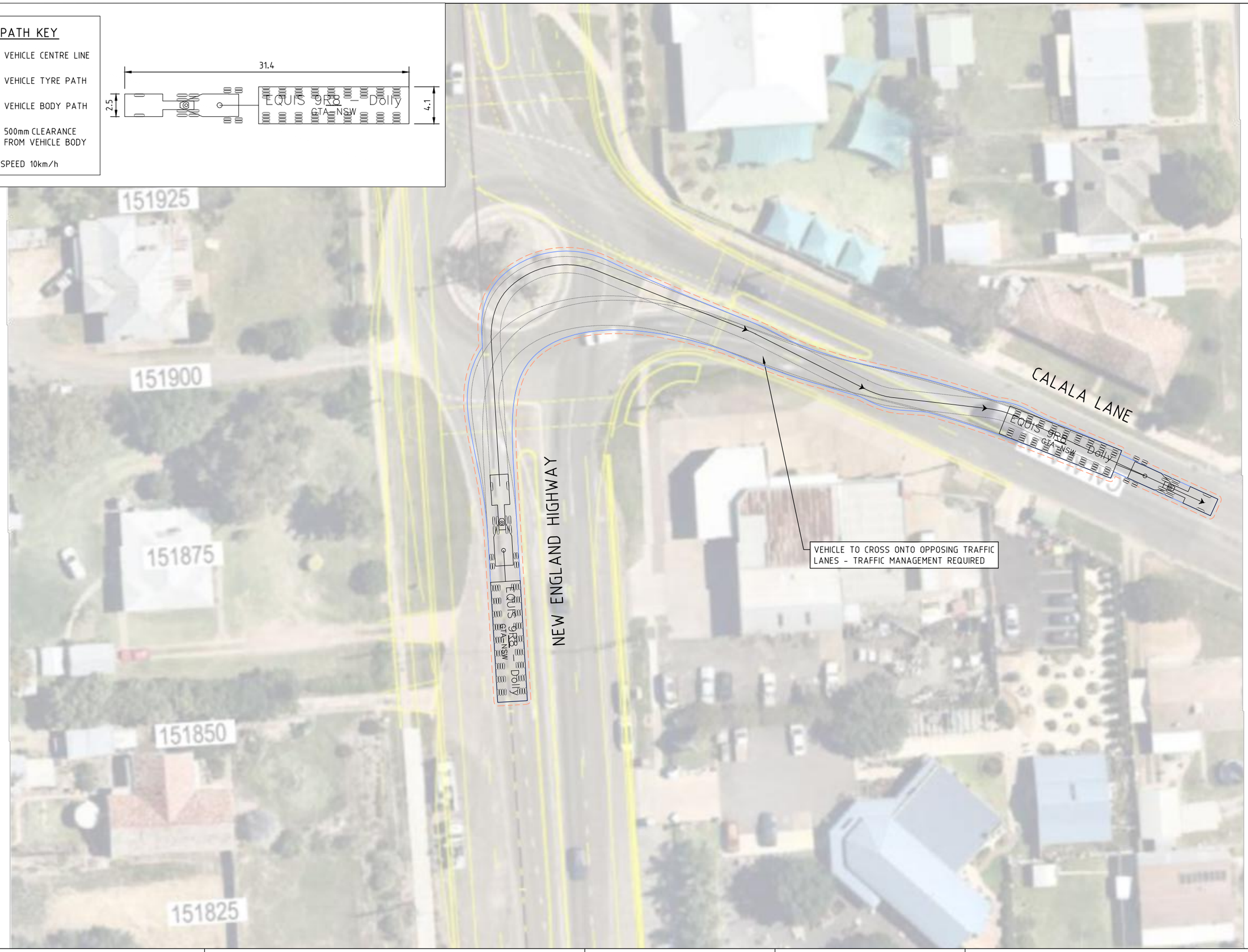
\\AU2019-PFFS01\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 13/07/2023 AT 12:34

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h




\\AU2019-PPFSS01\SHARED_PROJECTS\300304168\TECHNICAL\DRAWINGS\300304168-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 13/07/2023 AT 12:34

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| DESIGNED W.XIE | DESIGN CHECK R.HAZELL |
| APPROVED BY R.HAZELL | DATE ISSUED 13 JULY 2023 |

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CAD FILE NO. 300304168-03-P1.DWG

CALALA BESS
UPGRADED SIGNALISED INTERSECTION
NEW ENGLAND HWY/ CALALA LANE, SOUTH TAMWORTH
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300304168-02-04 SHEET 04 OF 04 ISSUE P1

# Appendix C. Transport for NSW Meeting Minutes

Stantec

# Meeting Minutes

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|---|---|---|---|
| **Project:** | Calala Battery Energy and Storage System (BESS) | **Date:** | 27 October 2023 |
| **Project №:** | 300304168 | **Time:** | 10:00am |
| **Venue:** | MS Teams | | |
| **Subject:** | **SSD52786213 - Parking and traffic impacts of development during construction and operation** | | |

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|---|---|
| **Attendees:** | Alexandra Power (TfNSW)<br>Gerrit Prent (Equis)<br>Ingrid Bissaker (Stantec)<br>Brett Maynard (Stantec)<br>William Xie (Stantec) |
| **Apologies** | Elizabeth Zorondo (Equis) |
| **Distribution:** | All Attendees |

| Item | Topic | Description | Action |
|---|---|---|---|
| **1** | Site Operation | • Equis/ Stantec confirmed site to be operated remotely with no permanent staff on-site<br>• Equis/ Stantec confirmed typical vehicles generated by site comprise B99 (cars, vans, utes)<br>• Stantec confirmed site designed to accommodate vehicles up to 12.5m HRV during operation | Note |
| **2** | Goonoo Goonoo Road Works | • Transport for NSW liaised with project manager and confirmed works to occur 2025/ 2026 and hence may not overlap with construction of BESS<br>• Transport for NSW reiterated requirements for the BESS contractor to liaise with Goonoo Goonoo Road works contractor throughout works | Note |
| **3** | Construction Traffic Impact | • Stantec confirmed traffic impact assessment conservatively assumes all vehicles travel to / from site to the west via Goonoo Goonoo Road/ Calala Lane. Notwithstanding, staff in particular would likely also arrive from the east<br>• Stantec confirms Calala Lane midblock continues to operate at LOS C<br>• TfNSW requests midblock assessment of Goonoo Goonoo Road<br>• TfNSW requests understanding of traffic impact of construction on the Calala Lane / Goonoo Goonoo Road intersection operation using SIDRA, including considering an appropriate growth year scenario | Stantec to update Transport Assessment prior to SSDA lodgement with Goonoo Goonoo Road midblock assessment, outcomes from SIDRA assessment and tube count data |
| **4** | Over Size Over Mass (OSOM) Vehicle Assessment | • Stantec confirmed construction will generate 4 OSOM vehlices<br>• Transport for NSW queried possibility for other vehicles to be OSOM<br>• Stantec confirmed vehicle route from Port of Newcastle to site via Hexham, with route deviation at Muswellbrook via Bell Street overbridge due to 5.2 metre height restriction under railway. Route deviation follows TfNSW approved 4.6m approved route.<br>• TfNSW noted Bell Street overbridge and medians will need to be reviewed to ensure structure can accommodate OSOM vehicle/ load<br>• Stantec confirmed the report considers various road works throughout Newcastle. Transport for NSW noted the potential impact to route (i.e. similar to recent closure of Tarro Bridge) impacting route viability.<br>• Stantec noted given four OSOM vehicles, contractor to engage with road work contractors to ensure any such closures will be considered in programming. | Stantec to update Transport Assessment prior to SSDA lodgement with details of vehicle types for transport of other major components<br>Stantec/ Equis to continue review of Bell Street overbridge/ structural viability of medians to accommodate loads |
| **5** | Goonoo Goonoo Road Works | • Transport for NSW liaised with project manager and confirmed works to occur 2025/ 2026 and hence may not overlap with construction of BESS | Note |
| **6** | Closing | • Transport for NSW acknowledged all items discussed may not form part of submission, however can be captured in Response to Submissions | Note |

**From:** Bissaker, Ingrid
**To:** Alexandra Power; Gerrit Prent; Elizabeth Zorondo
**Cc:** Maynard, Brett
**Subject:** RE: Calala BESS - SSD-52786213 Pre-Lodgment Meeting
**Date:** Thursday, November 2, 2023 2:19:00 PM

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Thank you Alexandra, much appreciated.

We have assessed future midblock and intersection capacity based on a 2025 growth year scenario (noting construction program is Q1 2024 to Q2 2025) to respond to the below additional comment, with results outlined in the SSDA report.

Thank you for your time over the last two weeks.

Regards,

**Ingrid Bissaker**
Senior Transport Engineer

Direct:
ingrid.bissaker@stantec.com

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**From:** Alexandra Power <Alexandra.Power@transport.nsw.gov.au>
**Sent:** Thursday, November 2, 2023 1:37 PM
**To:** Bissaker, Ingrid <ingrid.bissaker@stantec.com>
**Subject:** RE: Calala BESS - SSD-52786213 Pre-Lodgment Meeting

Hello Ingrid,

Reviewed the minutes and do not raise any concerns etc, except for the Goonoo Goonoo Road/Calala Lane intersection comment midblock should be changed to traffic count survey at this intersection or sensitivity analysis of existing data sources i.e Goonoo Goonoo Road project with the inclusion of a growth rate for the peak year of construction for the Calala BESS.

Kind regards

Alexandra Power
Team Leader Development Services-Renewables West
Regional and Outer Metropolitan Division | TfNSW
**T**

Please be advised that I work flexible hours.

Roads and Maritime Services

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OFFICIAL

**From:** Bissaker, Ingrid <ingrid.bissaker@stantec.com>
**Sent:** Tuesday, 31 October 2023 1:34 PM
**To:** Alexandra Power <Alexandra.Power@transport.nsw.gov.au>
**Cc:** Maynard, Brett <brett.maynard@stantec.com>; Gerrit Prent <Gerrit.Prent@equis.com>; Elizabeth Zorondo <Elizabeth.Zorondo@equis.com>; Development West <development.west@transport.nsw.gov.au>; Xie, William <William.Xie@stantec.com>
**Subject:** RE: Calala BESS - SSD-52786213 Pre-Lodgment Meeting

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Hi Alexandra,

Thank you for your time last Friday. Please see meeting minutes attached. Please confirm acceptance or advise of any discrepancies and we can naturally update / reissue.

Regards,

**Ingrid Bissaker**
Senior Transport Engineer

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ingrid.bissaker@stantec.com

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