St Marys Freight Hub

Traffic and Transport Assessment Addendum

BITZIOS consulting
traffic engineering • transport planning

ACFS PORT LOGISTICS

5 April 2023

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

Sydney
Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557 6202

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P5670.001R St Marys Freight Hub Traffic and Transport Assessment Addendum	S. Daizli / T. Islam	D. Bitzios	D. Bitzios	10/05/2022	Russell Brown, ACFS Port Logistics
P5670.002R St Marys Freight Hub Traffic and Transport Assessment Addendum	S. Daizli	D. Bitzios	D. Bitzios	5/04/2023	Russell Brown, ACFS Port Logistics

CONTENTS

		Page
1.	**INTRODUCTION**	**1**
1.1	Background	1
1.2	SEARs	1
1.3	Purpose of this Report	3
1.4	Report Structure	3
2.	**DEVELOPMENT DETAILS**	**4**
2.1	Development Description	4
2.2	Operating Hours	5
2.3	Light Vehicle Traffic Generation Considerations	6
2.4	Truck-Traffic Generation Calculations	7
2.4.1	Step 1: Train Paths and Container Deliveries to and from St Marys	7
2.4.2	Step 2: Truck Pick-ups Per Day	8
2.4.3	Step 3: Daily Profile Distribution Assumptions and Peak Hour Truck Trips	8
2.5	Truck-Traffic Distribution	9
2.6	Peak Truck-Traffic Volumes	11
3.	**EXTERNAL NETWORK IMPACTS ASSESSMENT**	**13**
3.1	Differences between B-doubles and A-doubles	13
3.2	Impacts Differences Summary	15
4.	**SITE CONFIGURATION ASSESSMENT**	**17**
4.1	Access Assessment	17
4.2	Manoeuvring and Parking	18
4.2.1	Forrester Road Heavy Vehicle Access and On-Site Parking	18
4.2.2	Lee Holm Road Light Vehicle Access and On-Site Parking	19
5.	**CONCLUSIONS**	**20**

Tables

Table 1.1: SEARs Items and Response Locations
Table 2.1: Key Components of the St Marys Freight Hub
Table 2.2: St Marys Freight Hub Operating Hours and Staffing
Table 2.3: Key Intersections Assessed
Table 2.4: TEU Ratios
Table 2.5: Assumed Truck-Traffic Volume Distribution
Table 3.1: B-double and A-double Specifications
Table 3.2: B-double and A-double Intersection Impacts
Table 3.3: B-double and A-double Mid-block Impacts
Table 4.1: Safe Intersection Sight Distances – Cars and Trucks

Figures

Figure 1.1: Site Location and Study Area
Figure 2.1: St Marys Freight Hub Layout and Access Roads
Figure 2.2: Assumed Daily Traffic Profile Distribution
Figure 2.3: Traffic Distribution Source Data Example
Figure 2.4: Truck-Trip Distribution
Figure 2.5: Development Traffic Volume Increase at Each Intersection based on 2018/2019 AM Peak Background Data
Figure 2.6: Development Traffic Volume Increase at Each Intersection based on 2018/2019 PM Peak Background Data
Figure 4.1: Safe Intersection Sight Distances – Forrester Road
Figure 4.2: Safe Intersection Sight Distances – Lee Holm Road
Figure 4.3: Forrester Road Heavy Vehicle Access Exit Swept Path
Figure 4.4: Forrester Road Heavy Vehicle Access Entry Swept Path

1. INTRODUCTION

1.1 Background

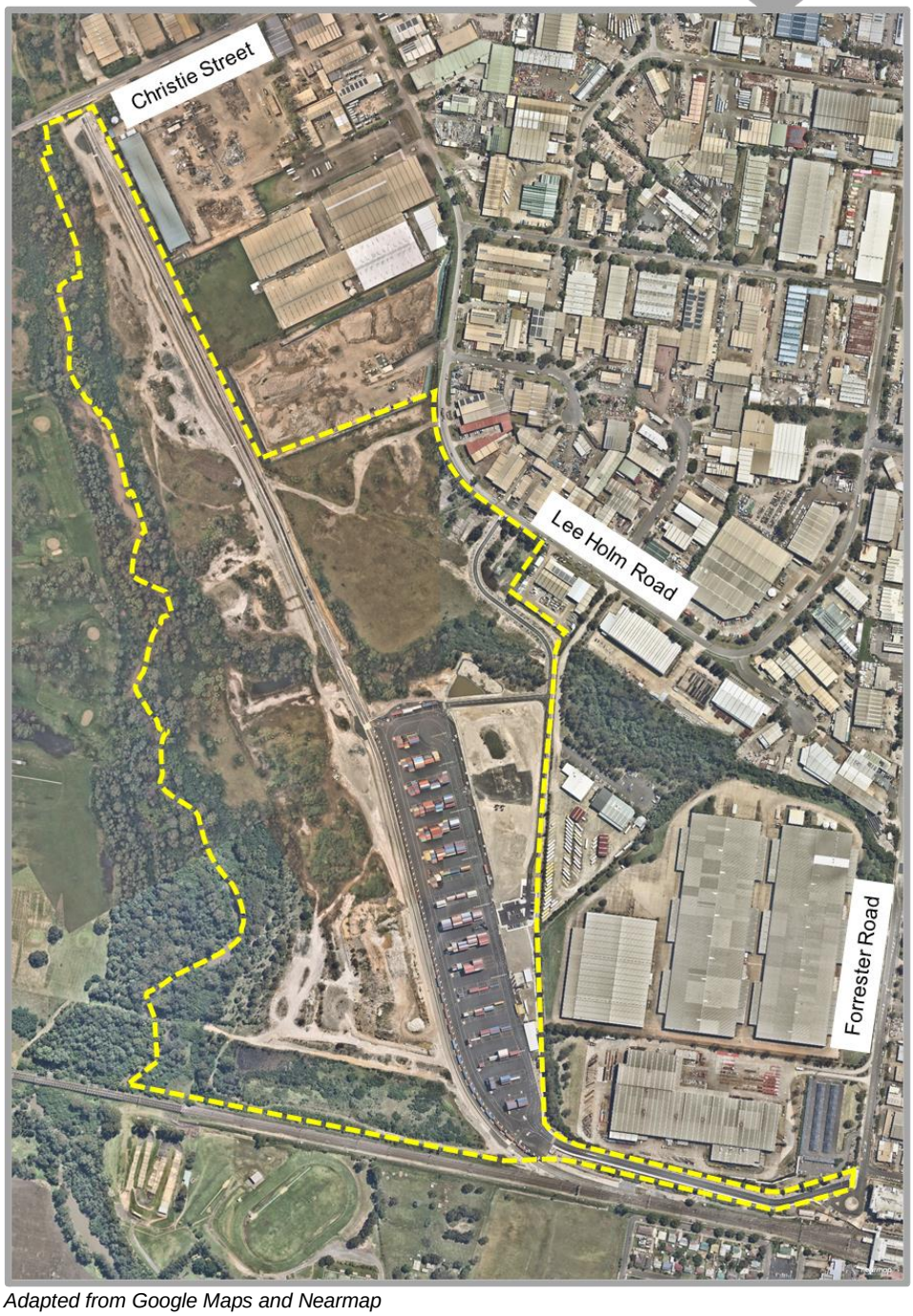
In 2019, Bitzios Consulting was engaged by Pacific National (the Applicant) to undertake a Traffic and Transport Assessment (*P3796.006R St Marys Freight Hub Traffic and Transport Assessment*, dated 10 September 2019) as part of an Environmental Impact Statement for the (now operational) St Marys Freight Hub. The St Marys Freight Hub is an inland intermodal container terminal located north of St Marys Railway Station in the Penrith Local Government Area, NSW. The facility has a maximum operating capacity of 301,000 Twenty-Foot Equivalent Units (TEUs) per annum and operates 24 hours a day, 7 day a week. The site location and study area considered as part of the Traffic and Transport Assessment are shown in Figure 1.1.

1.2 SEARs

The Planning Secretary released its revised Environmental Assessment Requirements (SEARs) for this development on 23 October 2018. Table 1.1 details the SEARs relevant to traffic and transport considerations along with where they are addressed in this report.

Table 1.1: SEARs Items and Response Locations

SEARs Item	Addressed in Section
Provide details of the proposed access to the site, including emergency vehicle access arrangements, from the road network including intersection location, design and sight distance.	2.1, 4.1
Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times)	4.1
Details of proposed access arrangements, including car and bus pickup/drop-off facilities and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossing and refuges and speed control devices and zones.	4.1
Provide detailed plans of the proposed layout of the internal road network and parking on-site in accordance with the relevant Australian Standards.	2.1
Accurate details of the current daily and peak hour vehicle, public transport, pedestrian and cycle movement and existing traffic and transport facilities provided on the road network located adjacent to the proposed development.	2.6
Provide accurate daily and peak traffic forecasts, including vehicle, public transport, pedestrian and bicycle trips, generated by the project during construction and operation, including details of heavy vehicle transport routes to the State Road networks and types of vehicles.	2.2-2.6
An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures.	4.1
Consider the constructability constraints of proposed intersection upgrades such as vehicle swept paths, geometry and sight lines, and avoidance of removal of bus lanes.	4.2
The proposed car and bicycle parking provision, including end-of¬ trip facilities, which must be taken into consideration of the availability of public transport and the requirements of Council's relevant parking codes and Australian Standards	4.2



Adapted from Google Maps and Nearmap

Figure 1.1: Site Location and Study Area

1.3 Purpose of this Report

ACFS Port Logistics is the site owner and operator. ACFS recently received approval for the use of A-doubles for the site in addition to B-doubles.

This *Addendum* Traffic and Transport Assessment Report should be read in conjunction with the 2019 report. This report centres on the identification of any changes to impacts and to mitigation measures necessary with the introduction of A-doubles compared to the previously-assumed sole use of B-doubles.

1.4 Report Structure

This remainder of this report is structured as follows:

- **Section 2, Development Proposal Details:** Describes the site and summarises the traffic generation and distribution
- **Section 3, External Impacts Assessment:** Describes the key differences between A-doubles and B-doubles and identifies if there are any capacity and/or safety impacts differences between the two vehicle types that affect roads beyond the Forrester Road site access
- **Section 4, Site Configuration Assessment:** Summarises the sightline and swept path assessments undertaken at the Forrester Road site access for A-doubles instead of B-doubles
- **Section 5, Conclusions:** Summarises the key findings of this addendum report.

2. DEVELOPMENT DETAILS

2.1 Development Description

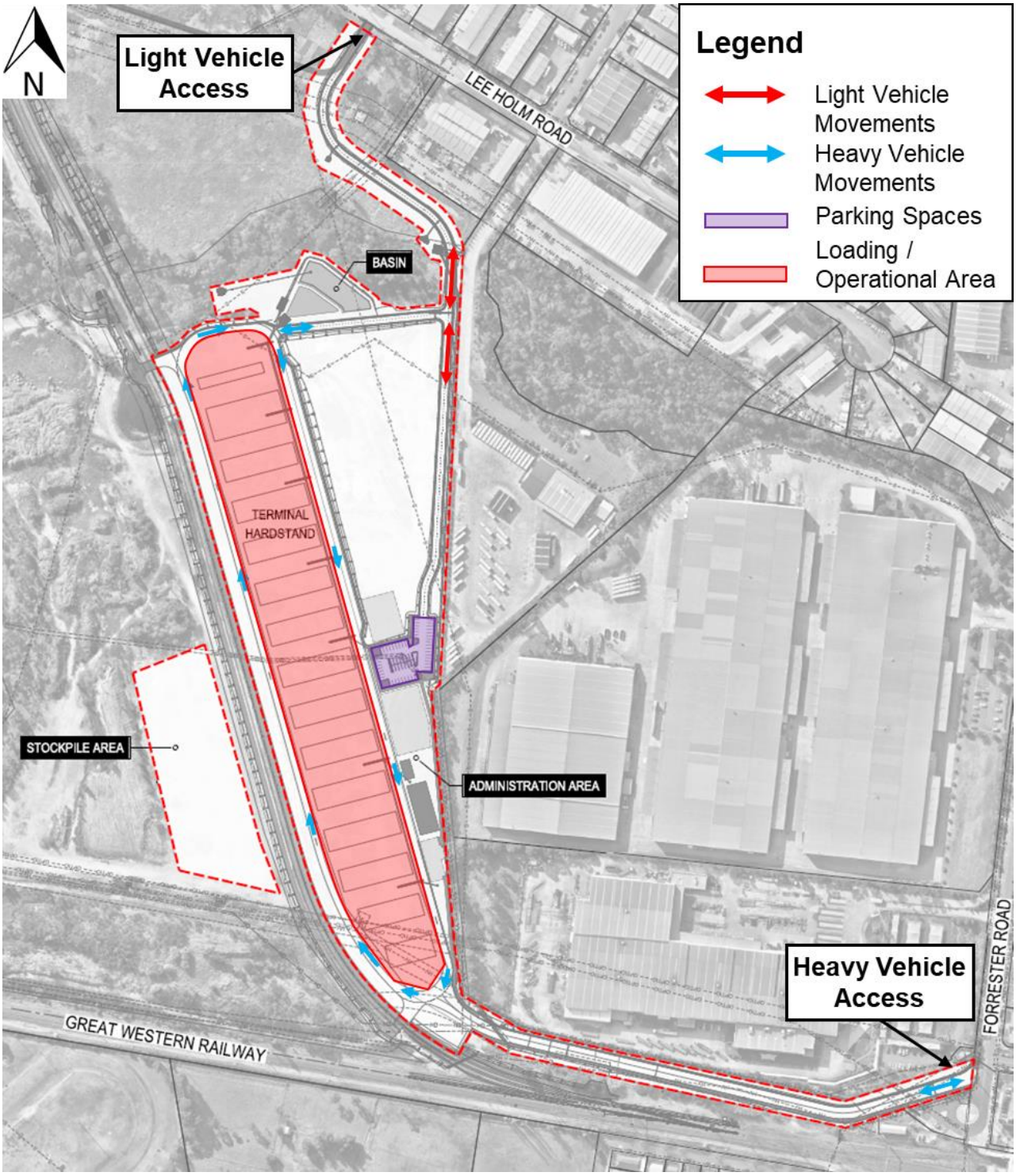
The St Marys Freight Hub is a 9.9-hectare road and rail inland container terminal, with a maximum operating capacity of 301,000 TEUs per annum. The site receives full containers from Port Botany by rail. An onsite truck fleet transports the full containers from the site to customers throughout Western Sydney. The trucks return to the site with empty containers which are transported back to Port Botany by train. The distribution of these containers was mostly undertaken via truck trips to/from Port Botany. The location of this facility in Western Sydney reduces the length of trucks on the wider Sydney road network.

Key components of the St Marys Freight Hub are summarised in Table 2.1.

Table 2.1: Key Components of the St Marys Freight Hub

Construction Activities	Ancillary Development
▪ Hardstand area for container storage and laydown, rail and vehicle loading and unloading areas ▪ New internal access roads providing separate ingress and egress for light and heavy vehicles as follows: - To/from Lee Holm Road for light vehicles - To/from Forrester Road for heavy vehicles ▪ Wash bay area ▪ Office building pad site ▪ Fuel storage area ▪ Container workshop (repair bay) pad site ▪ Transport workshop pad site ▪ Staff and visitor light vehicle parking bays ▪ Heavy vehicle parking bays	▪ Signage and landscaping ▪ Utility services to support the development including drainage, potable water, water (for firefighting purposes), power, data, security and sewerage ▪ Minor realignment of a section of the Sydney Trains high voltage overhead power line at the southern end of the subject site ▪ Minor clearing of areas of vegetation regrowth, remediation and minor earthworks ▪ Electrical transformer

The site layout and access roads are shown in Figure 2.1.



Source: BG&E

Figure 2.1: St Marys Freight Hub Layout and Access Roads

2.2 Operating Hours

The site's transport operations are 24/7, except for a cease of operations from Saturday 2pm to Sunday 4am. Rail intermodal operations are also 24/7. Empty depot operations are 24 hours a day Monday to Friday and possibly on Saturday from 5am-12pm. The site's operating hours and staff by shift are summarised in Table 2.2. Truck movements to and from the site reduced by 33% between 7:30-9am and 2:30-4pm on weekdays to a maximum of 15 trucks IN and 15 trucks OUT over each 1.5-hour school peak period.

Table 2.2: St Marys Freight Hub Operating Hours and Staffing

Section	Approx. Staff	Hours	Details
1. Administrative/management staff per mantle deployed to St Marys	30	▪ 4am-4pm (day shift)	Office staff generally work a maximum 10-hour shift within the span of hours provided
	7	▪ 4pm-4am (night shift)	
2. Truck drivers starting and ending their shifts at St Marys, train drivers and ground crew	20	▪ 7 trucks 5am-3pm ▪ 8 trucks 6am-4pm (day shift)	Drivers generally work 10 hours per day
	20	▪ 7 trucks 3pm-1am ▪ 8 trucks 4pm-2am (night shift)	
3. Permanent service/maintenance staff stationed at St Marys	8	▪ Usually 5am-5pm	Staff generally work a maximum 10-hour shift within the span of hours provided
	2	▪ Usually 5pm-5am	
4. Permanent terminal staff (reach stacker, forklift operators, and any other administrative/ground staff)	23	▪ 24 hours	3 equal shifts which will not coincide with road peak hours

2.3 Light Vehicle Traffic Generation Considerations

As shown in Table 2.2, private vehicle movements for site-based staff occur at times which do not coincide with the peak hours of the surrounding road network. In terms of private vehicle traffic, taking a conservative assumption that all staff will drive their own vehicles, daily two-way traffic would be approximately 124 private vehicle-movements per day with a maximum of approximately 40-45 staff vehicles on-site during the day. Given the low level of staff traffic arriving during daytime hours and that this traffic will typically be outside of the road peak hours, the traffic generation calculations and traffic impact assessments at key intersections as listed in Table 2.3 and shown in Figure 2.5 have been limited to the impacts of truck movements.

Table 2.3: Key Intersections Assessed

No.	Intersection	Control Type
1	Richmond Road / Dunheved Road	Signals
2	Great Western Highway / Parker Street	Signals
3	Great Western Highway / Werrington Road / Reserve Road	Signals
4	Great Western Highway / Queen Street / Mamre Road	Signals
5	Great Western Highway / Carlisle Avenue	Signals
6	Mamre Road / M4 Western Motorway (M4) (south)	Signals
7	Mamre Road / M4 Western Motorway (M4) (north)	Signals
8	Great Western Highway / Glossop Street	Signals
9	Glossop Street / Harris Street	Priority
10	Forrester Road / Harris Street	Priority
11	Forrester Road / Glossop Street	Signals
12	Forrester Road / Boronia Street / Christie Street	Roundabout
13	Christie Street / Dunheved Road / Werrington Road	Roundabout

2.4 Truck-Traffic Generation Calculations

2.4.1 Step 1: Train Paths and Container Deliveries to and from St Marys

Trains deliver full containers from Port Botany to St Marys and return empty containers from St Marys to Port Botany a maximum five times a day. There is a maximum capacity of 87 TEUs per train and this capacity is constrained by the overall train length of 600m as per Sydney Trains and Australian Rail Track Corporation requirements. The 87 TEU slots equate to 54.4 containers which are a combination of approximately 60% of 40 ft containers and 40% of 20 ft containers per train service. There are five confirmed train paths, and this translates to maximum of 136 truck movements out of the Freight Hub and 136 empty container truck movements returning to the Freight Hub per day. These calculations are conservative and based on an average truck load capacity of 3.2 TEUs, considering B-doubles which carry 3 TEUs and A-doubles which carry 4 TEUs and form part of the ACFS truck fleet. Therefore, 136 in and 136 out truck movements per day is the worst-case scenario and is expected to be less given the predominant use of A-doubles which carry more than B-doubles. Table 2.4 provides a justification of this ratio.

Table 2.4: TEU Ratios

Boxes	40ft Boxes	20ft Boxes	TEUs	Ratio of 40ft Containers	Ratio of Box/TEU
40	24	16	64	0.6	0.625
41	24.6	16.4	65.6	0.6	0.625
42	25.2	16.8	67.2	0.6	0.625
43	25.8	17.2	68.8	0.6	0.625
44	26.4	17.6	70.4	0.6	0.625
45	27	18	72	0.6	0.625
46	27.6	18.4	73.6	0.6	0.625
47	28.2	18.8	75.2	0.6	0.625
48	28.8	19.2	76.8	0.6	0.625
49	29.4	19.6	78.4	0.6	0.625
50	30	20	80	0.6	0.625
51	30.6	20.4	81.6	0.6	0.625
52	31.2	20.8	83.2	0.6	0.625
53	31.8	21.2	84.8	0.6	0.625
54	32.4	21.6	86.4	0.6	0.625
54.1	32.46	21.64	86.56	0.6	0.625
54.2	32.52	21.68	86.72	0.6	0.625
54.3	32.58	21.72	86.88	0.6	0.625
54.4	**32.64**	**21.76**	**87.04**	**0.6**	**0.625**
54.5	32.7	21.8	87.2	0.6	0.625
54.6	32.76	21.84	87.36	0.6	0.625
54.7	32.82	21.88	87.52	0.6	0.625
54.8	32.88	21.92	87.68	0.6	0.625
54.9	32.94	21.96	87.84	0.6	0.625
55	33	22	88	0.6	0.625

The site's capacity is restricted by the train paths, train capacity and train system capacity. The site is not used for localised container storage associated with truck movements only. That is, full containers arrive by train and are picked up from the site and delivered by truck to their destination. Empty containers are then picked up from surrounding locations and returned to the site and then loaded onto trains for the return trip to Port Botany. The site does not act as an export operation (import only), and no unpacking of containers or distribution takes place on-site.

It is important to highlight that the site is not used as a truck-to-truck intermodal facility and that the volume of truck trips generated by the site is be limited to the number of train paths approved by Sydney Trains. There is no basis to assume additional trucks will be generated based on these limitations.

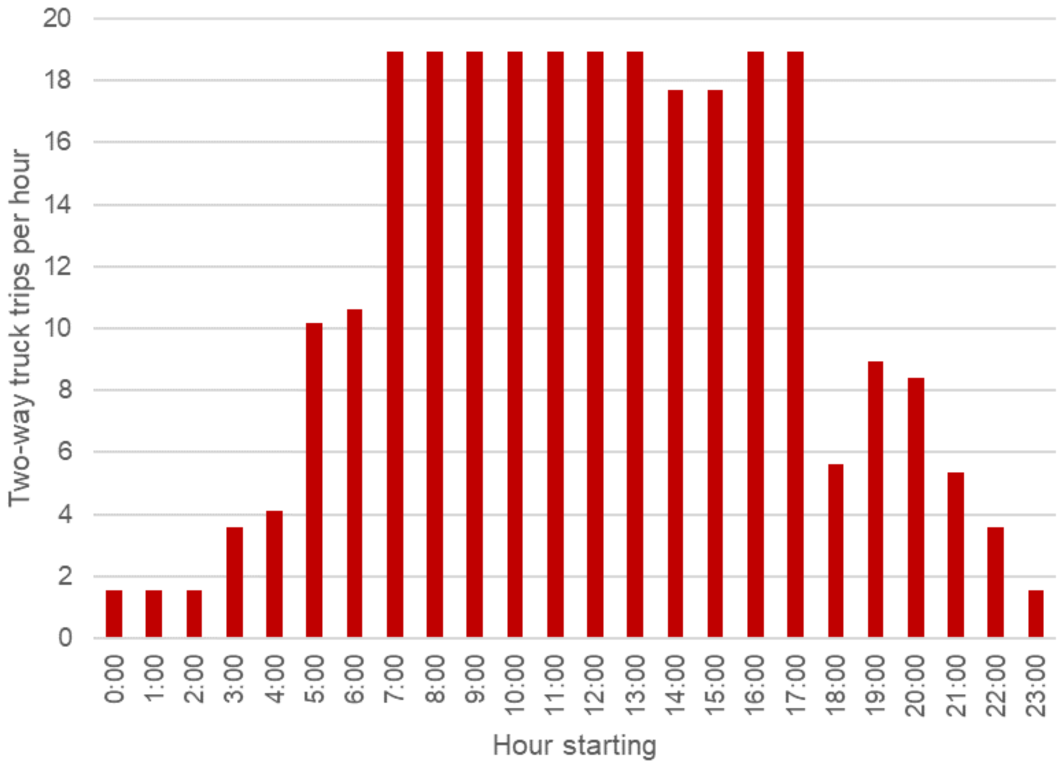
2.4.2 Step 2: Truck Pick-ups Per Day

The 54 containers per train multiplied by the maximum permissible five scheduled train trips per day equates to 272 containers IN and 272 containers OUT of the St Marys Freight Hub per day. Based on current truck to container ratio data, each truck carries on average 1.25 containers (2 TEUs x 0.625) using a mix of 30m B-doubles (3 TEUs) and A-doubles (4 TEUs). The maximum number of daily truck movements (based on 100% use of B-doubles and A-doubles) equates to 136 trucks movements IN and 136 truck movements OUT of the site per day (87 TEUs inbound x 5 train paths and 87 TEUs outbound x 5 train paths which equates to 100% asset utilisation (maximum capacity)). It is important to note that this traffic generation is controlled by the five available train paths per day.

It should also be highlighted that several conservative assumptions have been made to generate the absolute maximum likely truck-traffic generation that the site is capable of producing. The conservative volumes presented below will be higher than the average day site traffic generation.

2.4.3 Step 3: Daily Profile Distribution Assumptions and Peak Hour Truck Trips

The site is a '24/7' operation and many of the container destinations accept 'after dark' deliveries due to the nature of their businesses. To account for this, but taking a conservative approach, it has been assumed that approximately 80% of all daily trips will take place between 6:00am and 6:00pm (109 trips each way). This results in 10 trucks IN and 10 trucks OUT during both the AM and PM peaks using a uniform trip distribution profile between 6:00am and 6:00pm and aligned with efficient handling processes which is what an optimised business model would achieve at the Freight Hub. A relatively flat profile across the day is reasonable and common as it provides the most cost-efficient way for the business to use human resources and equipment resources across the day. The assumed daily traffic profile distribution is shown in Figure 2.2. The AM and PM peak hours for the intersections surrounding the development are 8:00am to 9:00am and 4:30pm to 5:30pm respectively.



Source: Traffic Generation Modelling (Pacific National)

Figure 2.2: Assumed Daily Traffic Profile Distribution

There is not a significant number of employees on-site and the private vehicle arrival and departure times are highly unlikely to coincide with the road network peak hours due to the varying nature of shift times for on-site staff.

2.5 Truck-Traffic Distribution

The distribution of truck trips has been based on a detailed customer spreadsheet available for deliveries to/from Port Botany prior to being delivered to/from the St Marys Freight Hub. This spreadsheet details the number of trips each month to each site over a 12-month period. A sample of the customer location database is shown in Figure 2.3.

Box Size	Delivery Suburb	St Marys Band	Inbound Route	Outbound Route
40	ALLAMBIE HEIGHTS	36	None	None
20	ALTONA NORTH	>50km	106-4, 107-8, 104-7, 108-12	108-1, 104-6, 107-1
20	ALTONA NORTH	>50km	106-4, 107-8, 104-7, 108-12	108-1, 104-6, 107-1
40	ALTONA NORTH	>50km	106-4, 107-8, 104-7, 108-12	108-1, 104-6, 107-1
40	ALTONA NORTH	>50km	106-4, 107-8, 104-7, 108-12	108-1, 104-6, 107-1
40	ANNANGROVE	18	None	None
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11
20	ARNDELL PARK	8	105-5, 108-4	108-3, 105-11

Inbound

Row Labels	Sum of Freq	%
101-3	12	0%
105-1, 108-4	1	0%
105-5, 108-4	9716	13%
106-4, 107-8, 104-7, 108-12	53581	73%
106-8, 107-8, 104-7, 108-12	8445	11%
107-12, 104-7, 108-12	7	0%
None	1840	2%
Grand Total	**73602**	

Outbound

Row Labels	Sum of Freq	%
101-4	12	0%
108-1, 104-6, 107-1	53581	73%
108-1, 104-6, 107-2, 106-2	8445	11%
108-1, 104-6, 107-2, 106-3	7	0%
108-3, 105-11	9716	13%
108-3, 105-12	1	0%
None	1840	2%
Grand Total	**73602**	

Figure 2.3: Traffic Distribution Source Data Example

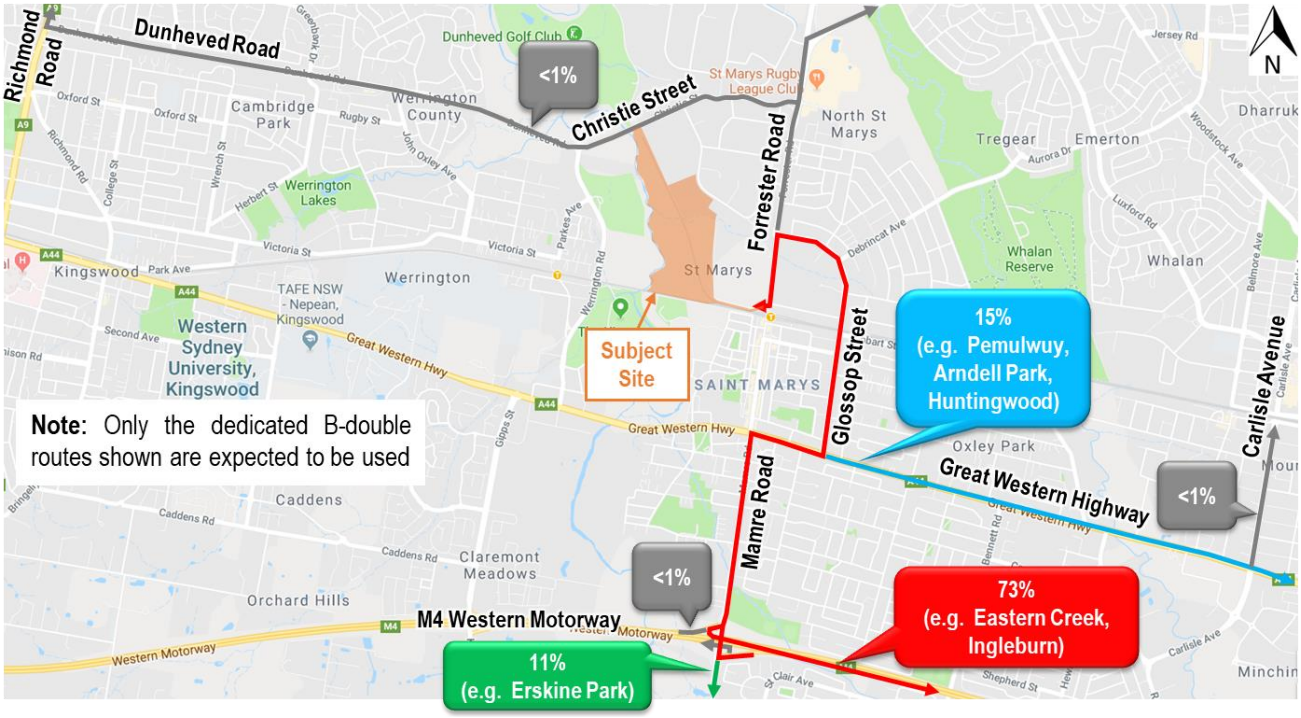
The following methodology was used to determine the AM and PM peak traffic distribution onto the surrounding road network and intersections:

- **Step 1:** The site addresses were aggerated into suburb names
- **Step 2:** Eastern suburbs (i.e. Sydney CBD, Port Botany, Alexandria, St Peters etc.) were excluded as it was assumed that deliveries to these areas would continue to be directly from Port Botany
- **Step 3:** Suburb-based movements were further aggregated into general delivery 'directions' to/from the St Marys Freight Hub
- **Step 4:** The online National Heavy Vehicle Regulator (NHVR) Journey Planner was used to identify suitable B-double routes to each destination
- **Step 5:** Total truck volumes per peak hour were calculated through and as far as the location of the surveyed intersections nominated by Transport for NSW (for assessment under the SEARs) and Penrith City Council.

The expected truck-traffic distribution is illustrated in Figure 2.4 for the two-way access at Forrester Road entrance with Glossop Street/Forrester Road as the nearest intersection accommodating inbound and outbound movements.

The interpretation of the destination distribution data along with the route paths highlights that more than 80% of trucks are likely to use the Glossop Street - Great Western Highway - Mamre Road route.

The routes which were calculated as having <1% of peak hour truck movements were not considered further in splitting the 10 AM peak and 10 PM peak truck-trips given they equate to less than one truck trip per hour.



Adapted from Google Maps

Figure 2.4: Truck-Trip Distribution

2.6 Peak Truck-Traffic Volumes

Based on the calculated truck-traffic distribution, the AM and PM peak traffic volumes calculated for each route are summarised in Table 2.5.

Table 2.5: Assumed Truck-Traffic Volume Distribution

Route (refer to Figure 2.4)	AM Peak In	AM Peak Out	PM Peak In	PM Peak Out
Red	7	7	7	7
Blue	2	2	2	2
Green	1	1	1	1
Grey	0	0	0	0

The 2018 AM and PM 'base' and 'with development' truck-traffic volumes for each intersection for each peak one hour are summarised in Figure 2.5 and Figure 2.6 respectively. The following summarises the key intersections which will have the maximum increase of 20 trucks during both the AM and PM peaks. The percentage increase in traffic due to development trucks is also shown below:

- Great Western Highway/Glossop Street (an increase of 0.6% and 0.5% respectively based on 2018 traffic volumes)
- Glossop Street/Harris Street (increase of 0.7% and 0.6% respectively based on 2019 traffic volumes)
- Forrester Road/Glossop Street (increase if 1.1% and 0.9% respectively based on 2019 traffic volumes).

Additionally:

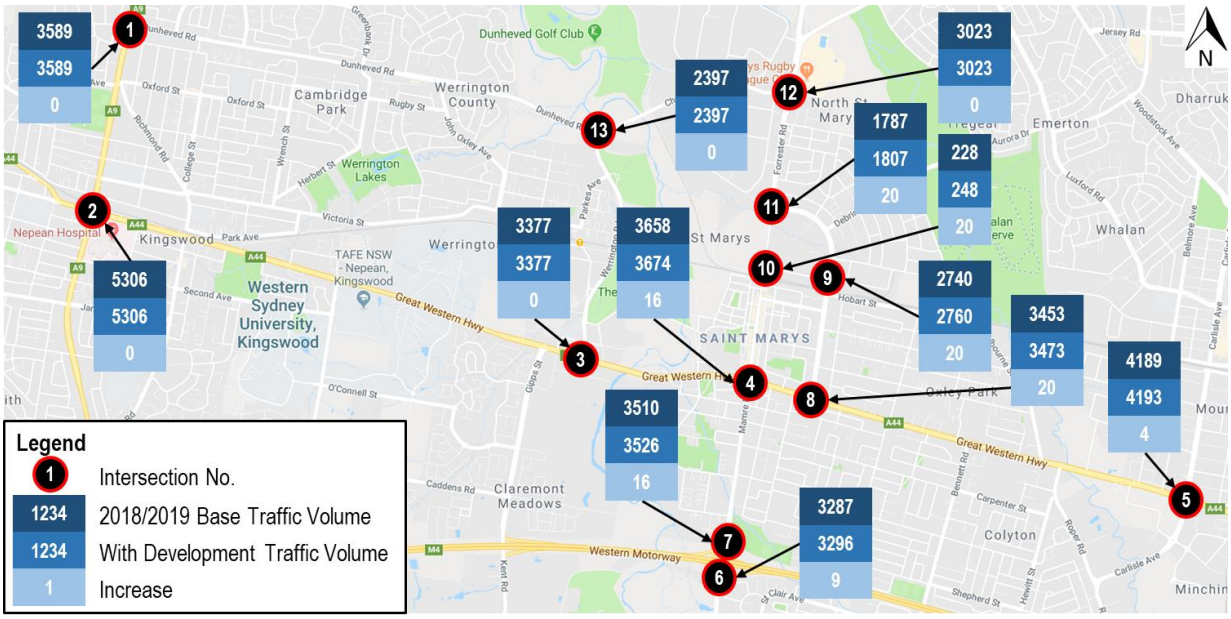
- Great Western Highway/Mamre Road will increase by 16 trucks per peak hour
- Mamre Road/M4 north will increase by 16 trucks per peak hour
- Mamre Road/M4 south will increase by 9 trucks per peak hour
- Forrester Road/Glossop Street will increase by 15 trucks per peak hour
- From the surveyed intersections, Richmond Road/Dunheved Road, Great Western Highway/ Parker Street and Great Western Highway/Werrington Road/Reserve Road are not expected to be impacted by any additional trucks during either the AM or PM peaks
- The Freight Hub adds only 9% to Forrester Road traffic during peak hours, which is well within the road capacity. Forrester Road just south of Glossop Street carries 176 vehicles per hour southbound in the AM peak and 281 vehicles per hour northbound in the PM peak. These volumes are well below the typical capacity of a single lane urban road at 1,200 vehicles per hour.

It should be noted that the Freight Hub reduces the length of many truck trips that were formerly accessing customers via Port Botany (1 truck from St Marys replaces 9 to 10 trucks from Port Botany). It is very difficult to quantify this reduction, however, assuming that St Marys represents the centre of the market which receives its containers from Port Botany, approximately 55km per one-way truck trip generated will be reduced on the broader network. With 272 truck trips per day (136 IN and 136 OUT), this equates to 14,960 truck-kms per day removed off the regional road network or 5,460,400 truck-kms per annum.

Key benefits to the regional road network associated with this reduction include:

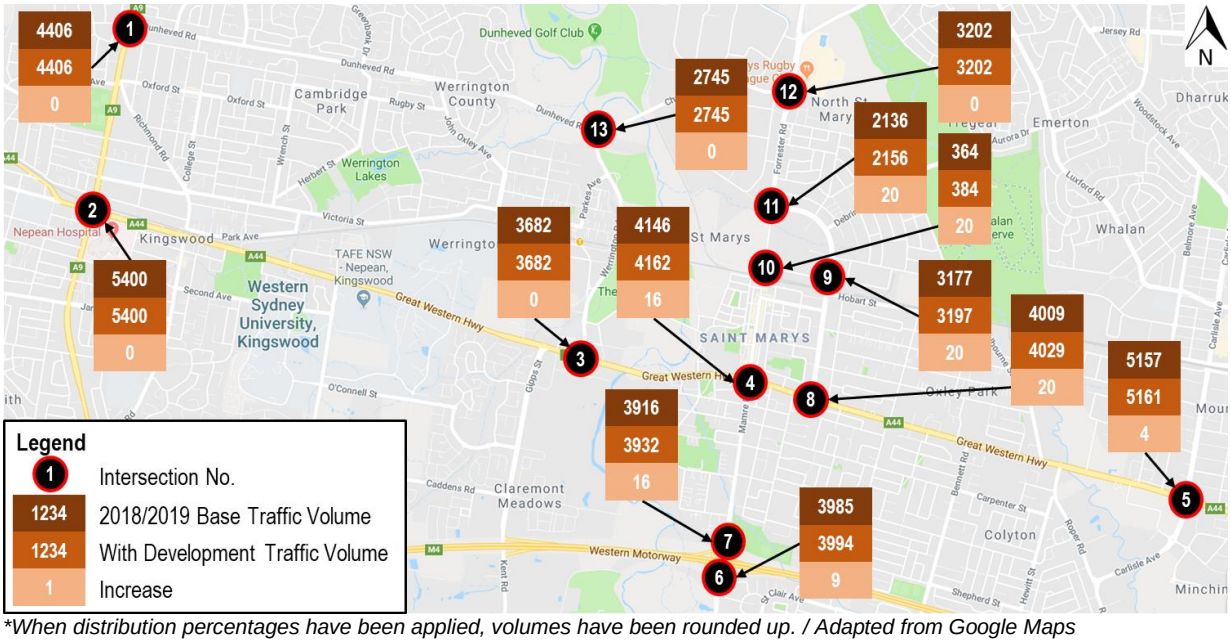
- Contributing to reducing road congestion and improving journey times for other road users
- Reducing the extent of pavement impacts on major roads
- Reducing travel times, operating costs and hence reducing the economic impacts of freight movements
- Reducing emissions and noise on the road network.

In general, rail freight transport is three times more energy efficient and produces one-third of the emissions of road-based freight transport (https://www.artc.com.au/move-your-freight-on-rail/environmental-benefits-of-rail/). There are wider economic and community benefits in moving freight from road to rail for more of the freight carriage distance.



When distribution percentages have been applied, volumes have been rounded up. / Adapted from Google Maps

Figure 2.5: Development Traffic Volume Increase at Each Intersection based on 2018/2019 AM Peak Background Data



When distribution percentages have been applied, volumes have been rounded up. / Adapted from Google Maps

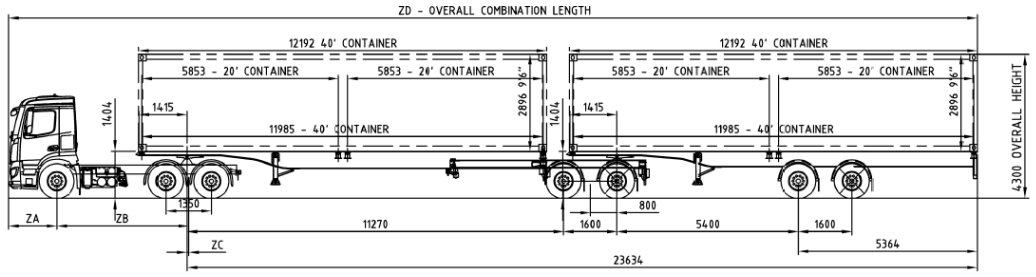
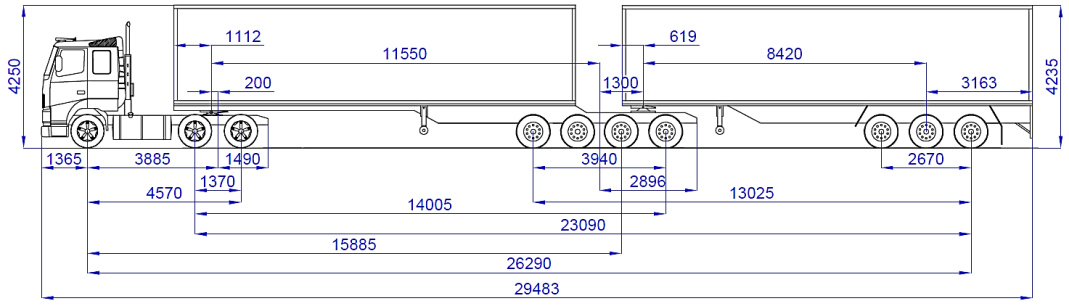
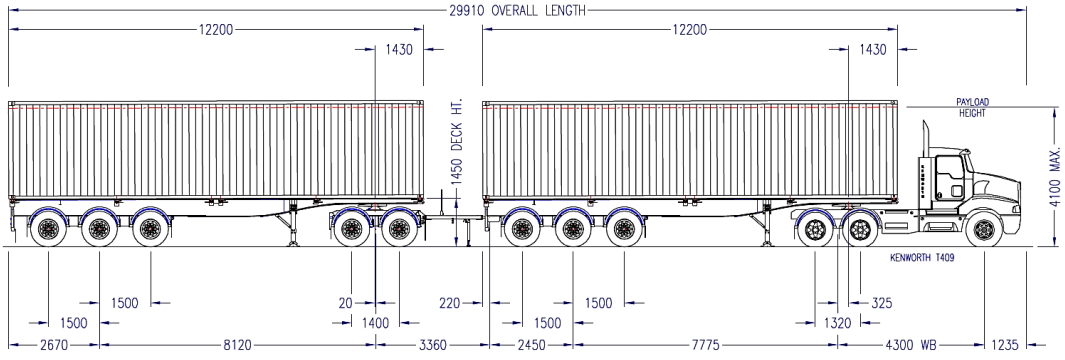
Figure 2.6: Development Traffic Volume Increase at Each Intersection based on 2018/2019 PM Peak Background Data

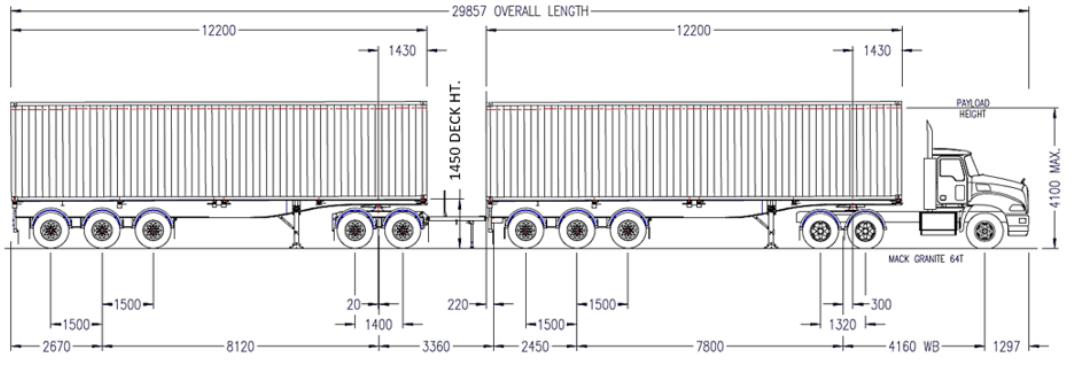
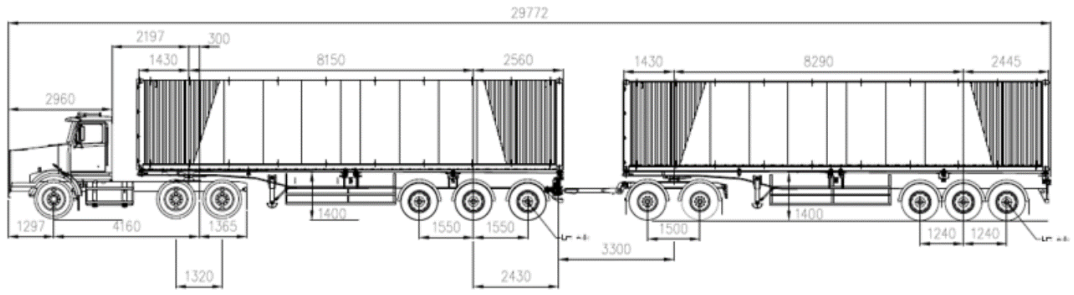
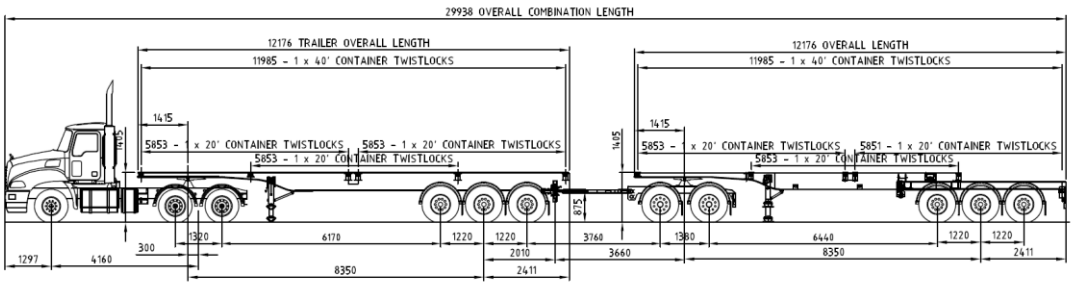
3. EXTERNAL NETWORK IMPACTS ASSESSMENT

3.1 Differences between B-doubles and A-doubles

The specifications of each B-double and A-double approved for operation are shown in Table 3.1. The overall vehicle lengths (~29m) and trailer lengths (~12m) are relatively similar. Also, vehicle storage lengths and turn paths at intersections are similar as detailed in the following section.

Table 3.1: B-double and A-double Specifications

Vehicle (dimensions in mm)	Key Dimensions
B-Double (2-2) 	▪ Overall length: ≤28949mm ▪ Trailer length: ≤12192mm
Quad-tri B-double 	▪ Overall length: ≤29483mm ▪ Trailer length: ≤12202mm
A-double (3-2-3) 	▪ Overall length: ≤29910mm ▪ Trailer length: ≤12200mm

Vehicle (dimensions in mm)	Key Dimensions
	▪ Overall length: ≤29857mm ▪ Trailer length: ≤12200mm
	▪ Overall length: ≤29772mm ▪ Trailer length: ≤12165mm
	▪ Overall length: ≤29338mm ▪ Trailer length: ≤12176mm

Vehicle specifications source: National Heavy Vehicle Regulator (July 2016 and February 2022).

3.2 Impacts Differences Summary

Table 3.2: B-double and A-double Intersection Impacts

Impacts with B-doubles	Impacts with A-doubles
Forrester Road just south of Harris Street Minor impact for B-doubles exiting the site (separately to entering B-doubles) just south-west of this intersection as they may have to slightly encroach the opposite side of the road.	No change
Forrester Road / Glossop Street No impact as the design of this signalised intersection (i.e. wide lanes and turn radii) means that B-doubles are able to undertake single-lane manoeuvres.	No change
Great Western Highway / Glossop Street From the Great Western Highway east approach, B-doubles need to use both right turn lanes when turning right, though this is typical at established intersections across Greater Sydney. Likewise, B-doubles on the Great Western Highway west approach need to use lanes 1 and 2 when turning left, which is not uncommon.	No change
Great Western Highway / Carlisle Avenue From the Carlisle Avenue north approach, B-doubles need to use both right turn lanes when turning right, though this is typical at established intersections across Greater Sydney. Likewise, B-doubles on the Great Western Highway west approach need to use lanes 1 and 2 when turning left.	No change
Great Western Highway / Queen Street / Mamre Road No impact as the provision of one turn left at any time with care slip lane on the Great Western Highway west approach and single lane to turn right from the Mamre Road south approach into the Great Western Highway mean that B-doubles are able to undertake single-lane manoeuvres.	No change
Mamre Road / M4 (north) No impact given the provision of one extended right turn lane from the Mamre Road north approach into the M4 eastbound 'G-loop', dual loop lanes and signalised dual left turn lanes on the M4 eastbound off-ramp.	No change
Mamre Road / M4 (south) No impact given the provision of one extended right turn lane from the Mamre Road south approach into the M4 westbound 'G-loop', dual loop lanes and turn left at any time with care slip lane on the Mamre Road north approach.	No change

Table 3.3: B-double and A-double Mid-block Impacts

Impacts with B-doubles	Impacts with A-doubles
Forrester Road (south of Glossop Street) No impact along this mostly straight and flat local industrial road, which includes 2 lanes (two-way), road markings (i.e. double lines between intersections/ access driveways), and parking and right turn lanes southbound	No change
Forrester Road (north of Glossop Street) No impact along this mostly straight and flat sub-arterial road, which includes 4 wide lanes (two-way), a median, some parking permitted northbound and parking lanes southbound	No change
Glossop Street No impact along this fairly straight and sub-arterial flat road, which includes 4 wide lanes (two-way), a wide median, No Stopping (6-10am and 3-7pm Mon-Fri) southbound between Elm Street and Debrincat Avenue (no parking permitted elsewhere) and right turn lanes at key intersections	No change
Great Western Highway No impact along this state arterial road, which includes 6 lanes (two-way), a median, No Parking restrictions and right turn lanes at key intersections	No change
Mamre Road No impact along this state arterial road, which includes 4 lanes (two-way), 'No Parking' restrictions and right turn lanes at key intersections	No change
M4 No impact along this inter-regional motorway, which includes 6 lanes (two-way) and a wide median	No change

As shown in Table 3.2 and Table 3.3, there is no change in impacts related to lane-space occupancy at intersections (capacity) or vehicle turning paths (geometry) at key intersections along the haul routes.

For all intents and purposes, A-doubles operate in the same way that the previously considered B-doubles would have at intersections.

4. SITE CONFIGURATION ASSESSMENT

4.1 Access Assessment

A sightline assessment was undertaken of the Forrester Road and Lee Holm Road site access points using the A*ustroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*. The minimum desirable safe intersection sight distances (SISD) from the access points for cars and trucks are shown in Table 4.1, Figure 4.1 and Figure 4.2.

Table 4.1: Safe Intersection Sight Distances – Cars and Trucks

Location	Design Speed Limit (Posted Speed Limit)	Safe Intersection Sight Distances	
		Cars	Trucks
Forrester Road	60km/h (50km/h) north of access	123m	134m
	20km/h (10km/h) south of access	32m	32m
Lee Holm Road	70km/h (60km/h)	151m	168m

Adapted from Nearmap

Figure 4.1: Safe Intersection Sight Distances – Forrester Road

Adapted from Nearmap

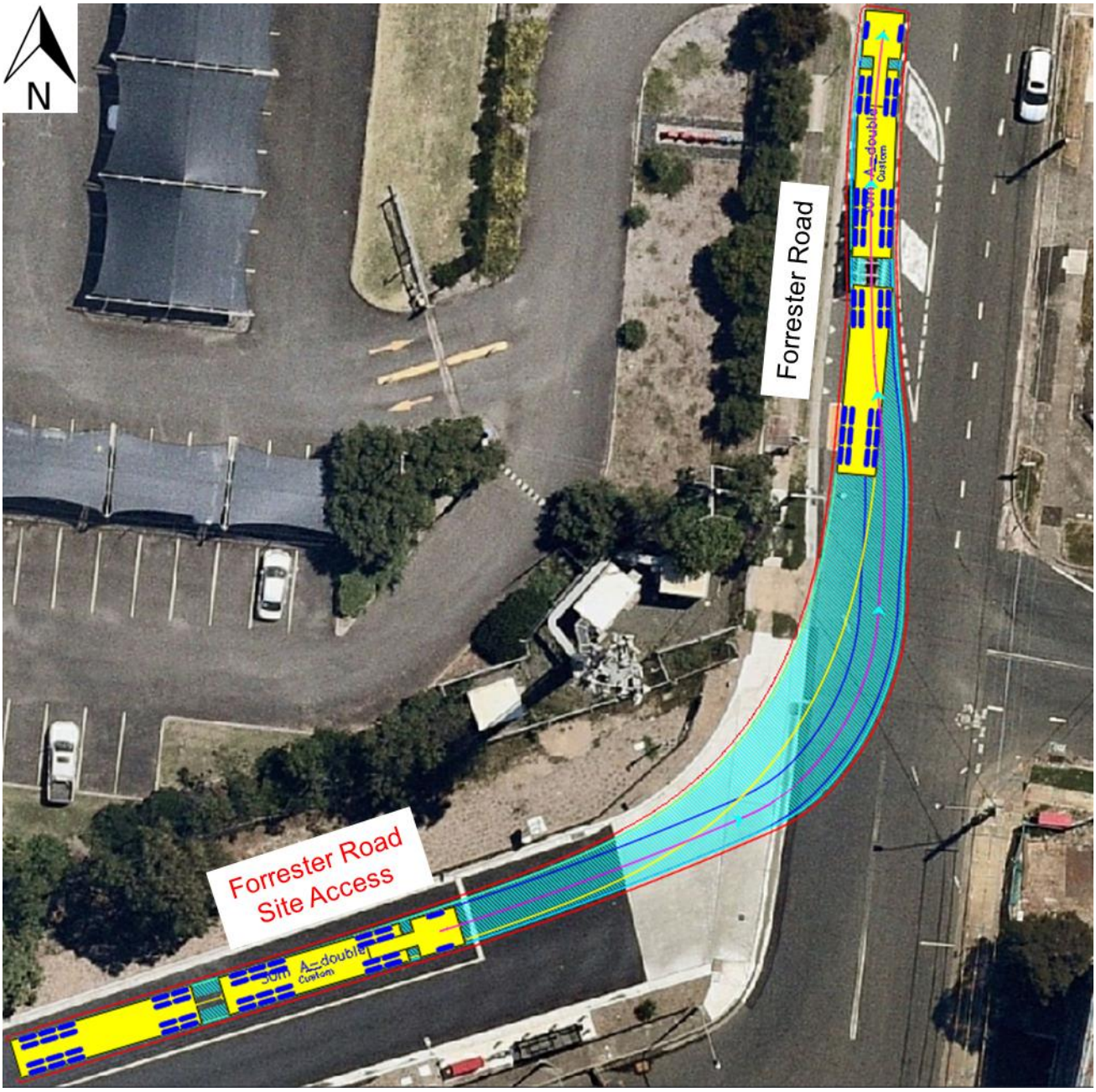
Figure 4.2: Safe Intersection Sight Distances – Lee Holm Road

At both locations, buildings are sufficiently set back and there is sufficient SISD for all approaches.

4.2 Manoeuvring and Parking

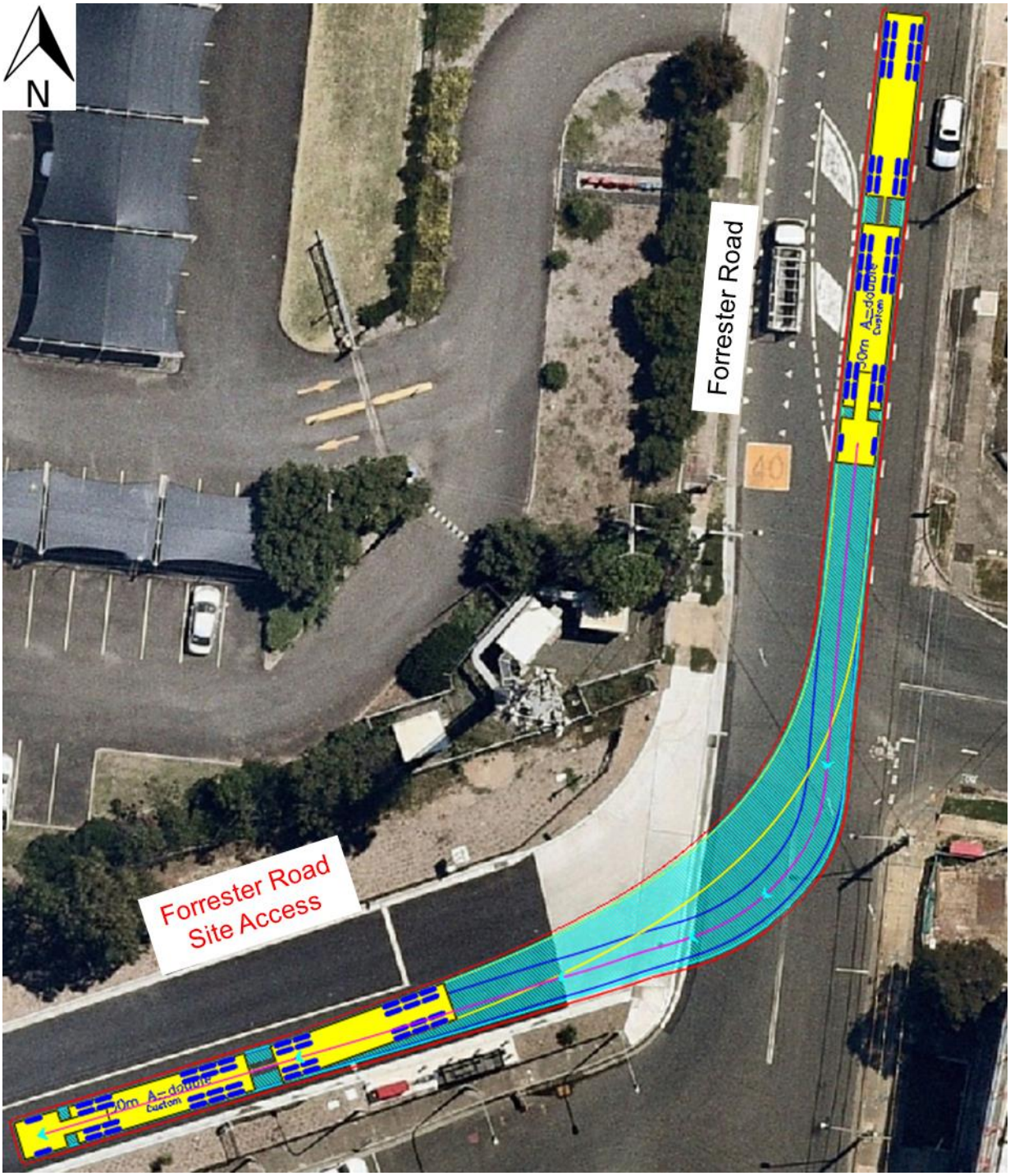
4.2.1 Forrester Road Heavy Vehicle Access and On-Site Parking

A swept path analysis was undertaken at the Forrester Road site access driveway using a 30m A-double as shown in Figure 4.3 and Figure 4.4, noting that entry and exits are undertaken separately using detection cameras (see Section 3.2.4 of the Operational Traffic and Access Management Plan for details). Additionally, all internal manoeuvring areas have been designed to accommodate the designated design vehicle in each area.



Adapted from Nearmap

Figure 4.3: Forrester Road Heavy Vehicle Access Exit Swept Path



Adapted from Nearmap

Figure 4.4: Forrester Road Heavy Vehicle Access Entry Swept Path

4.2.2 Lee Holm Road Light Vehicle Access and On-Site Parking

Light vehicles enter and exit the site via Lee Holm Road. A total of 62 car parking spaces and one PWD car parking space are provided on-site. All spaces have been designed in accordance with AS2890.1 and AS2890.6.

5. CONCLUSIONS

The key findings from this addendum to the Traffic and Transport Assessment for the St Marys Freight Hub in relation to the SEARs are summarised as follows:

Operational Period Traffic Generation

- The site will generate a negligible volume of private vehicle trips in the AM and PM peak hours. A maximum of approximately 40-45 office-based and maintenance/operations staff will be on-site during the day with almost all of these staff starting and ending their daytime shifts outside of road network peak hours. Even if some of these trips coincide with peak period conditions, this traffic has a negligible effect on operations when dispersed across all access routes to/from the site. On this basis, the traffic impact assessment has focussed on the impacts of truck trips generated by the site on the surrounding road network
- The site will generate a maximum of 136 truck entries and 136 truck exits per day, which is capped by the five (5) available freight train paths in/out per day to the site (maximum allowed by Sydney Trains). This equates to a maximum of 10 trucks IN and 10 trucks OUT in the AM and PM peak hours, comprising of a mix of B-doubles and A-doubles. This is not considered a lot of trucks in the context of surrounding truck movements within an industrial area
- The relatively low volume of truck turning movements generated by the site is not expected to exacerbate any prevailing crash patterns at the key intersections and roads surrounding the site.

Truck Route, Access and Parking

- The Forrester Road entrance - Glossop Street - Great Western Highway - Mamre Road route:
  - Minimises the number of congested intersections trucks need to make turning movements through
  - Has no impact on any local residential streets
  - Has minimal impact on the Council road network and B-double/A-double roads through industrial areas will be used.
- There are sufficient sight lines to/from potential access driveways on Lee Holm Road and on Forrester Road which are on industrial standard roads commensurate with accommodating the B-doubles and A-doubles generated by the site.