Appendix I

Traffic impact assessment

Blast Furnace No. 6 Reline Project

Traffic Impact Assessment

BlueScope Steel (AIS) Pty Ltd

7 March 2022

→ **The Power of Commitment**

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Printed date	7/03/2022 12:35:00 PM
Last saved date	7 March 2022 12:35 PM
File name	https://projectsportal.ghd.com/sites/pp01_01/bluescopebfeis/ProjectDocs/Appendix XX - Traffic Impact Assessment/12541101-REP_BlueScope TIA_Rev_C.docx
Author	Yrish Estoce
Project manager	Simon Murphy
Client name	BlueScope Steel (AIS) Pty Ltd
Project name	BlueScope Steelwork Blast Furnace 6 Reline Project
Document title	Blast Furnace No. 6 Reline Project | Traffic Impact Assessment
Revision version	Rev 1
12541101	12541101

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	Yrish Estoce	O. Peel	On file	K Rosen		22/10/2021
S4	1	Yrish Estoce	O. Peel	On file	K Rosen		07/03/2022

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Terms and abbreviations

Abbreviation	Description
AADT	Average annual daily traffic
AS	Australian Standard
AS/NZS	Australian and New Zealand Standard
BF	Blast Furnace
BF-BOF	Blast Furnace – Basic Oxygen Furnace
BlueScope	BlueScope Steel (AIS) Pty Ltd
CSSI	Critical State Significant Infrastructure
CTMP	Construction transport management plan
DPIE	Department of Planning, Industry and Environment
EB	East bound
EIS	Environmental Impact Statement
EP&A	*Environmental Planning and Assessment Act 1979*
FTE	Full time equivalent
GHD	GHD Pty Ltd
HV	Heavy vehicle
km	Kilometres
LGA	Local Government Area
LoS	Level of service
LV	Light vehicle
m	Metres
mm	Millimetres
NB	North bound
NSW	New South Wales
OSOM	Oversize Overmass
PCU	Passenger Car Units
pc/h	Passenger cars per hour
PKSW	Port Kembla Steelworks
SB	South bound
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
VCR	Volume Capacity Ratio
TAG	Transport Access Guide
TfNSW	Transport for New South Wales
TIA	Traffic Impact Assessment
WB	West bound

1. Introduction

1.1 Background and project overview

BlueScope Steel (AIS) Pty Ltd (BlueScope) is one of Australia's leading manufacturers and is a global leader in finished and semi-finished steel products. BlueScope's Port Kembla Steelworks (PKSW) operation in NSW includes two blast furnaces. No. 5 Blast Furnace (5BF) is currently operating, while No. 6 Blast Furnace (6BF) is currently in care and maintenance.

5BF is expected to continue to produce (molten) iron on a continuous basis until it reaches the end of its operational life at some stage between 2026 and 2030. BlueScope is proposing a move of iron manufacture from 5BF to 6BF, after 5BF ceases operation.

6BF last produced iron in 2011, at which point it was taken out of service and placed into care and maintenance. In order to prepare 6BF to become operational again, major maintenance works are required (the project). The project aims to return 6BF to service through a reline process that will be carried out while 5BF continues to operate.

The project has been declared critical state significant infrastructure (CSSI) in accordance with section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). This Traffic Impact Assessment has been prepared to support the preparation of an Environmental Impact Statement (EIS) under the EP&A Act for the project. The EIS has in turn been prepared to support the application for project approval, to be determined by the NSW Minister for Planning and Public Spaces.

1.2 Purpose of this report

GHD Pty Ltd (GHD) has been commissioned by BlueScope to prepare a traffic impact assessment (TIA). This report will support the preparation of an Environmental Impact Statement (EIS) under the EP&A Act for the project.

This report addresses the relevant criteria in the NSW Secretary's Environmental Assessment Requirements (SEARs) for the project issued in July 2021 (as outlined in Section 3.1) and assesses the potential traffic and transport related impacts associated with the construction and operation of the project.

The purpose of this report is to document the results of the TIA which include:

– Describing the existing traffic and transport environment around the PKSW.
– Reviewing of the existing road and transport conditions, traffic volumes and crash data.
– Reviewing of the construction works of the project and its access arrangements.
– Assessing the potential impacts of the project construction works and the performance of key intersections during construction.
– Determining suitable mitigation measures to minimise the impacts.

1.3 Limitations

The preparation of this TIA relied on the following data sources or was limited by the following:

– Site inspections undertaken at the surrounding road network in September 2021.
– Intersection traffic counts commissioned by GHD were undertaken in September 2021 during a weekday AM and PM peak period at the following intersections.
    - Cringila Car Park Road / Five Islands Road intersection (left in, left out only).
    - Loop Road / Cringila Car Park Road intersection.
    - Five Islands Road / Emily Road (Entry) intersection.
    - Five Islands Road / Emily Road (Exit) intersection.
    - Springhill Road / BlueScope Access Road signalised intersection.
    - Five Islands Road / Flagstaff Road intersection (left in, left out only).

– PKSW gate entries from 2019 provided by BlueScope.
– Traffic data from Port Kembla Gas Terminal Traffic Impact Assessment Report prepared by GHD in 2018.

The following assumptions have been made in the preparation of this TIA:

– Assumptions in regard to construction traffic generation and distribution for the project as provided by BlueScope as detailed in Section 5.
– Construction of the project is expected to occur in 2023, with construction expected to occur over a three-year period.
– Analysis of historical traffic growth trends at roads within the study area identified that traffic has generally declined over the last five years, pre-COVID-19 pandemic.
– The traffic volumes surveyed in September 2021 were factored using 2019 gate entries data to reflect regular operations and traffic conditions pre-pandemic in order to assess the assessment of operational traffic impacts.

2. Legislative and policy context

2.1 State Environmental Planning Policy (Infrastructure) 2007

Pursuant to Schedule 3 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) the project is considered to be traffic generating development to be referred to Transport for NSW (TfNSW). Clause 104 of ISEPP specifies that a consent authority must give written notice to TfNSW of an application for traffic generating development before granting development consent and consider any response provided by TfNSW. The project has been declared CSSI so development consent is not required. Regardless, TfNSW have been consulted with in the preparation of the SEARs (refer Section 2.3) and their comments addressed in the preparation of this TIA. A separate briefing note was also sent to TfNSW but no response was received prior to the finalisation of this report.

2.2 Guide to traffic generating developments

This TIA has been undertaken with reference to the *Guide to Traffic Generating Developments* (Roads and Maritime Services, 2002) (the Guide). The Guide provides a process and methodology to undertake the TIA. The traffic operation assessment process outlined in the Guide identifies the operating characteristics which need to be compared with agreed performance criteria.

The Guide states that existing daily traffic volumes on roads adjacent to a proposed development should be compared with estimated daily traffic volumes. This enables the functions of roads in the overall hierarchy of roads to be reviewed in the context of the proposed development. This TIA has been prepared based on this approach

The assessment criteria adopted for this report are outlined in Section 3.

2.3 Secretary's Environmental Assessment Requirements

The SEARs relevant to traffic impacts, together with a reference to where they are addressed in this report, are outlined in Table 2.1.

Table 2.1 Traffic and transport SEARs

Requirement	Where addressed in this report
Include a traffic impact assessment addressing construction and operational traffic impacts of the project, details of traffic types and volumes, access roads and haul routes	Sections 5 and 6
An assessment of the predicted impacts of project traffic on road safety and capacity, including consideration of cumulative traffic and the need for any road upgrades or infrastructure works to support the project	Sections 6.1 and 6.2. No infrastructure upgrades are proposed as part of this project.
Details of internal road layouts and vehicle movement plans to demonstrate that all vehicle sizes can be safely accommodated on site	Section 6.1. Note that the existing internal road network has been previously approved, designed and constructed in accordance with relevant standards.

3. Methodology

3.1 Approach to assessment

This section outlines the method and evaluation criteria used in the traffic assessment of the project. This report focuses on the ultimate peak construction traffic generation scenario for each road impacted by the project and the overall effect on the higher order road network. To assess these impacts reference is made to:

– The assessment of intersection performance impacts as outlined in Section 3.1.1.

– The assessment mid-block performance impacts as outlined in Section 3.1.2.

Traffic generation associated with the operation of the project will be significantly lower than during the peak construction period. Traffic impacts will therefore be reduced during the operational period compared to the construction period.

Other factors considered include potential impacts to car parking, public transport, active transport and safety. The project will not impact on any rail networks external to the PKSW site.

3.1.1 Intersection assessment criteria

The performance of the existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. The SIDRA 8 intersection modelling software was used to assess the proposed peak hour operating performance of intersections on the surrounding road network.

The criteria for evaluating the operational performance of intersections is provided by the *Guide to Traffic Generating Developments* (Roads and Maritime Services, 2002) and reproduced in Table 3.1. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (i.e. Level of Service), which is applied to each band of average vehicle delay.

Table 3.1 Level of Service Criteria for intersections

Level of Service (LoS)	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control modes	At capacity, requires other control mode
F	> 70	Over Capacity Unstable operation	Over Capacity Unstable operation

Source: Guide to Traffic Generating Developments (Roads and Maritime Services 2002)

3.1.2 Midblock assessment criteria

According to *Austroads Guide to Traffic Management, Part 3: Traffic Studies and Analysis*, Section 5.2.1, the one-way mid-block capacity of an urban arterial road with interrupted flow varies depending on the type of lane. The typical mid-block capacity for urban roads with interrupted flow is outlined in Table 3.2.

An interrupted flow facility road is one in which traffic flow conditions are subject to the influence of fixed elements such as traffic signals, stop signs, give-way signs, roundabouts or other controls which cause traffic to stop periodically, irrespective of the total amount of traffic; examples include urban streets, unsignalised and signalised intersections.

Table 3.2 Typical mid-block capacity for urban roads with interrupted flow

Type of lane	One-way mid-block capacity (pc/h)
Median or inner lane	
Divided Road	1000
Undivided Road	
Middle lane (of a 3 lane carriageway)	900
Divided road	900
Undivided road	1000
Kerb lane	
Adjacent to parking lane	900
Occasional parked vehicles	600
Clearway conditions	900

Source: Table 5.1 in Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis Note: pc/h = passenger cars per hour

However, *Austroads Guide to Traffic Management Part 3 – Traffic Studies and Analysis* (Section 5.2.1) outlines that:

> *Peak period mid-block traffic volumes may increase to 1200 to 1400 pc/h/lane on any approach road when the following conditions exist or can be implemented:*
>
> – *Adequate flaring at major upstream intersections.*
> – *Uninterrupted flow from a wider carriageway upstream of an intersection approach and flowing at capacity.*
> – *Control or absence of crossing or entering traffic at minor intersections by major road priority controls.*
> – *Control or absence of parking.*
> – *Control or absence of right turns by banning turning at difficult intersections*
> – *High volume flows of traffic from upstream intersections during more than one phase of a signal cycle.*
> – *Good co-ordination of traffic signals along the route.*

For the purposes of this assessment:

– A one-way mid-block capacity of 1,200 pc/h/lane has been adopted for arterial roads in the study area, including for Springhill Road and Five Islands Road.
– A one-way mid-block capacity of 900 pc/h/lane has been adopted for other roads in the study area, including Cringila Car Park Road, Loop Road, Emily Road, BlueScope Access Road, Flagstaff Road, and Old Port Road.

This is in keeping with the Austroads special conditions, which are reflective on the existing conditions for roads in the road network surrounding PKSW. This capacity is used to assess the Volume Capacity Ratio (VCR) of a particular road.

The VCR is a measure of the level of congestion on a road given the traffic volume and road capacity. When the VCR reaches 1, this indicates that the road is operating at 100 percent capacity.

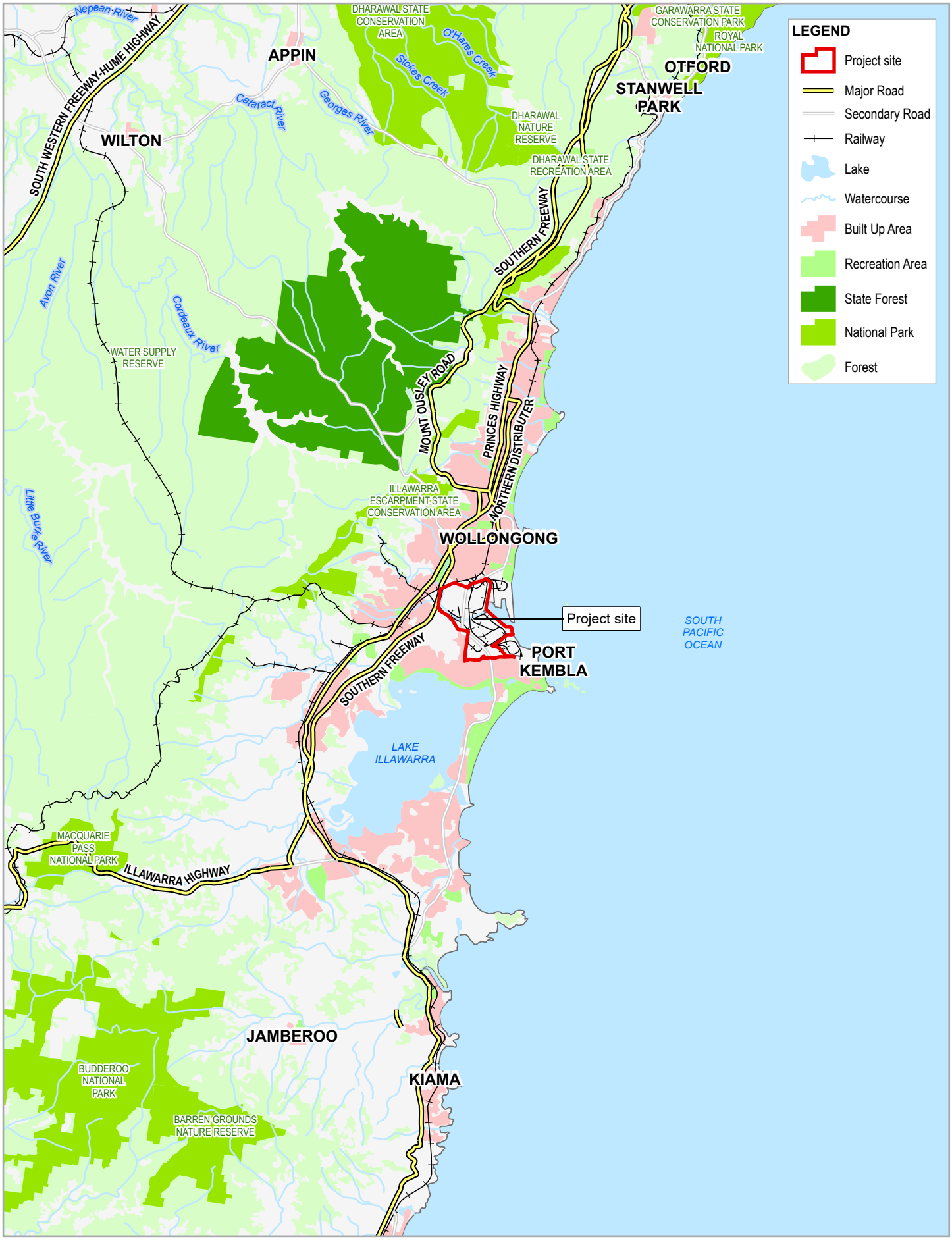
4. Existing environment

4.1 Project area

PKSW is located within an industrial site of approximately 750 hectares in the Wollongong Local Government Area (LGA), approximately 80 kilometres from Sydney and 2.5 kilometres from the City of Wollongong. Refer to Figure 4.1.

The PKSW site comprises the No.1 Works, No.2 Works, Steelhaven and the Recycling area. The No.2 Works is divided into two sections by Allans Creek. The southern half of the No.2 Works comprises the cokemaking, ironmaking and steelmaking facilities, while the northern half contains the Recycling Area and the packaging products section. All sectors of PKSW are internally linked by road and rail and are currently supplied with electricity, water and gas services.

The land to which this project applies, including all connecting infrastructure and materials handling elements that require upgrades as part of the project, is within the southern section of the No.2 Works, and part of the ironmaking facilities, which is located within Lot 1 DP 606434. Ancillary construction facilities will also be required and will be located within the wider PKSW site as shown in Figure 4.2.



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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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GHD

BlueScope Steel Ltd
No.6 Blast Furnace Reline and Operations
Traffic Impact Assessment

Project No. **12541101**
Revision No. **0**
Date **21/10/2021**

Regional Location

FIGURE 4-1

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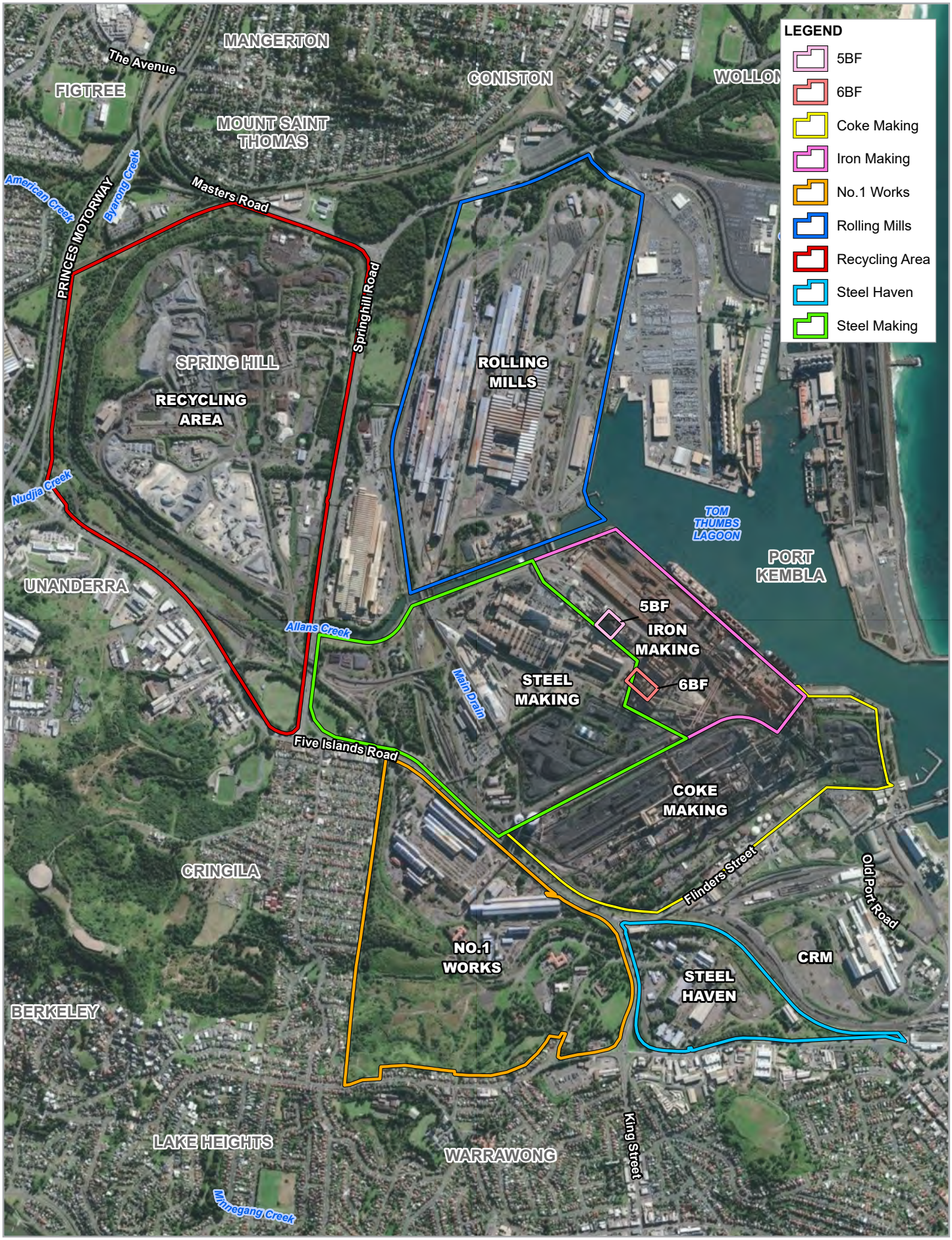

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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GHD

BlueScope Steel Ltd
No.6 Blast Furnace Reline and Operations
Traffic Impact Assessment

Port Kembla Steelworks site layout and locality

Project No. **12541101**
Revision No. **0**
Date **23/11/2021**

FIGURE 4-2

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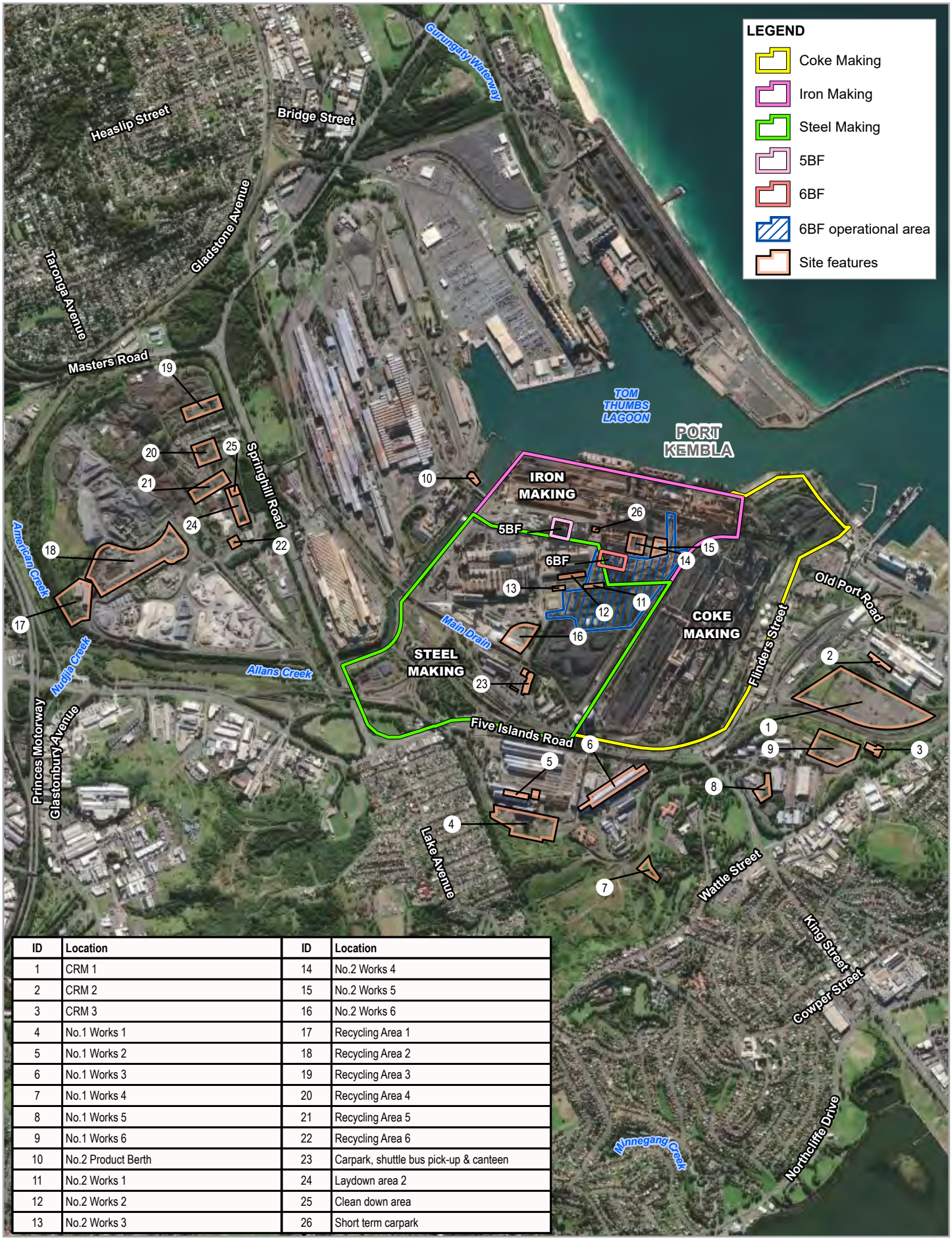
Created by: tmorton



ID	Location	ID	Location
1	CRM 1	14	No.2 Works 4
2	CRM 2	15	No.2 Works 5
3	CRM 3	16	No.2 Works 6
4	No.1 Works 1	17	Recycling Area 1
5	No.1 Works 2	18	Recycling Area 2
6	No.1 Works 3	19	Recycling Area 3
7	No.1 Works 4	20	Recycling Area 4
8	No.1 Works 5	21	Recycling Area 5
9	No.1 Works 6	22	Recycling Area 6
10	No.2 Product Berth	23	Carpark, shuttle bus pick-up & canteen
11	No.2 Works 1	24	Laydown area 2
12	No.2 Works 2	25	Clean down area
13	No.2 Works 3	26	Short term carpark

Paper Size ISO A4

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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GHD

BlueScope Steel Ltd
No.6 Blast Furnace Reline and Operations
Traffic Impact Assessment

Project No. **12541101**
Revision No. **0**
Date **21/10/2021**

Key project features

FIGURE 4-3

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Print date: 22 Oct 2021 - 09:08

Data source: LPI: DTDB/DCDB, 2017. World Imagery: Maxar.
Created by: tmorton

4.2 Existing road network characteristics

This section provides an understanding of the existing road network surrounding the site.

4.2.1 Road hierarchy

Roads within NSW are categorised in the following two ways:

– By classification (ownership).
– By the function that they perform.

Classification and function definitions are described in the following sections.

Road classification

Roads are classified (as defined by the *Roads Act 1993*) based on their importance to the movement of people and goods within NSW (as a primary means of communication). The classification of a road allows TfNSW to exercise authority of all or part of the road. Classified roads include Main Roads, State Highways, Tourist Roads, Secondary Roads, Tollways, Freeways and Transitways.

For management purposes, TfNSW has three administrative classes of roads. These are:

– **State Roads** – Major arterial links throughout NSW and within major urban areas. They are the principal traffic carrying roads and are fully controlled by TfNSW with maintenance fully funded by TfNSW. State Roads include all Tollways, Freeways and Transitways; and all or part of a Main Road, Tourist Road or State Highway.
– **Regional Roads** – Roads of secondary importance between State Roads and Local Roads which, together with State Roads provide the main connections to and between smaller towns and perform a sub arterial function in major urban areas. Regional roads are the responsibility of councils for maintenance funding, though TfNSW funds some maintenance based on traffic and infrastructure. Traffic management on Regional Roads is controlled under delegation by local government. Regional Roads may be all or part of a Main Road, Secondary Road, Tourist Road or State Highway; or other roads as determined by TfNSW.
– **Local Roads** – The remainder of roads are council-controlled roads. Local Roads are the responsibility of local councils for maintenance funding. TfNSW may fund some maintenance and improvements based on specific programs (e.g. urban bus routes, road safety programs). Traffic management on Local Roads is controlled under the delegation by local government.

Functional hierarchy

Functional road classification involves the relative balance of the mobility and access functions. TfNSW define four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

– **Arterial Roads** – generally controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distances between regional centres.
– **Sub-Arterial Roads** – can be managed by either TfNSW or local council. Typically, their operating capacity ranges between 5,000 and 20,000 vehicles per day, and their aim is to carry traffic between specific areas in a sub region, or provide connectivity from arterial road routes (regional links).
– **Collector Roads** – provide connectivity between local roads and the arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.
– **Local Roads** – provide direct access to properties and the collector road system, and typically carry less than 2,000 vehicles per day.

A map of the key roads within the study area and their respective classifications is presented in Figure 4.5. The key roads are discussed further in the following sections.

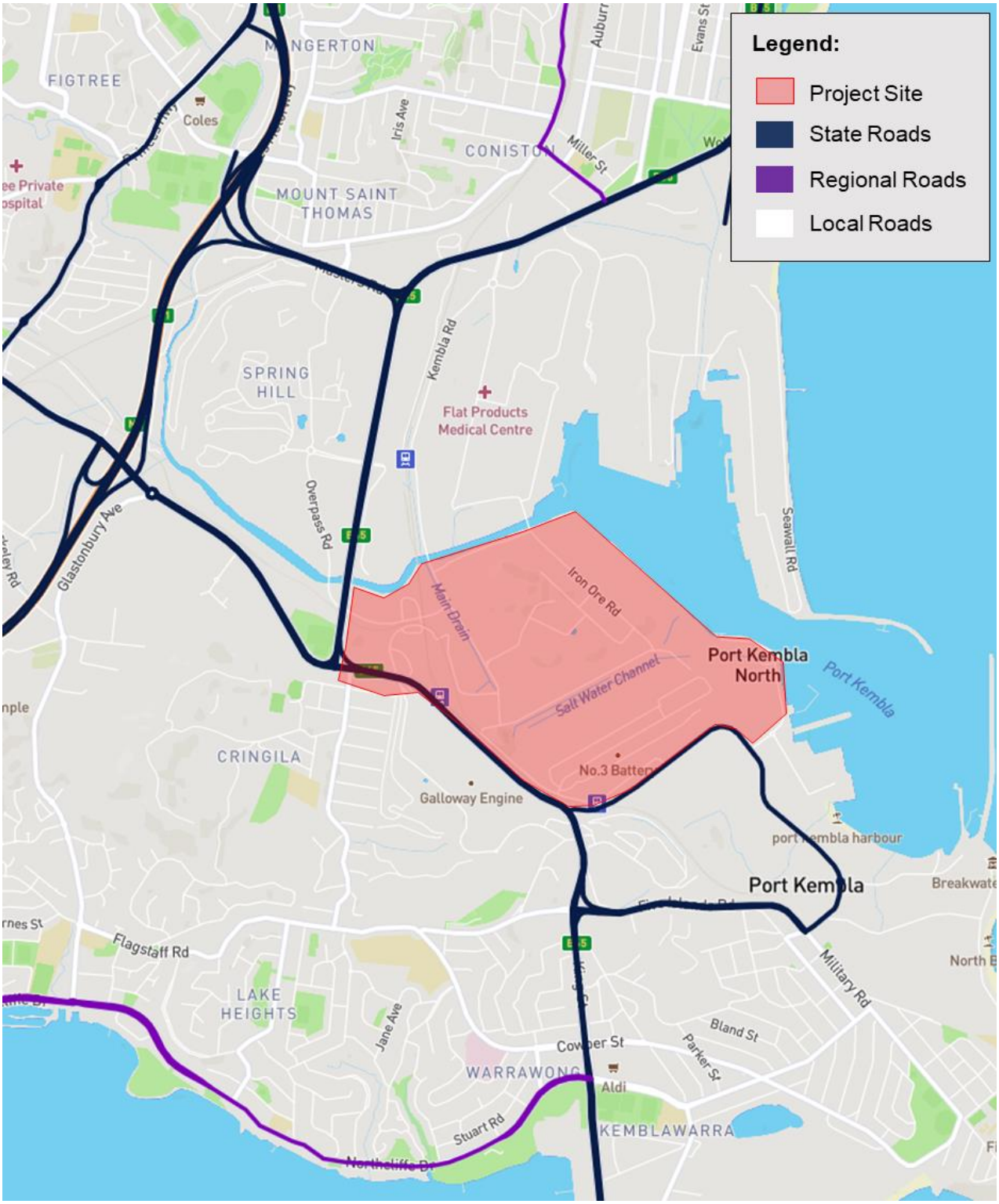


Figure 4.4 Road classification within study area

Source: NSW Road Network Classifications, TfNSW, modified by GHD

4.2.2 Road characteristics

Springhill Road

Springhill Road (typical carriageway shown in Figure 4.5) is a state arterial road and forms part of the B65, which connects Wollongong Central Business District and Port Kembla. It runs in an approximately northeast to southwest alignment between Corrimal Street and the signal-controlled intersection with Masters Road. To the south of Masters Road, Springhill Road runs in an approximate north to south alignment and forms the northern approach to a signal-controlled intersection with Five Islands Road.

Springhill Road provides access to mainly industrial and port related land uses, including access roads to PKSW, which are accessed via signal-controlled intersections.

Springhill Road has the following key features outlined in Table 4.1.

Figure 4.5 Springhill Road, viewed westwards from BlueScope North Gate

Image Source: Google Street View

Table 4.1 Springhill Road key features

Feature	Description
Carriageway	Sealed dual carriageway with a raised centre median, with three traffic lanes in each direction.
Parking	Parking and stopping is restricted.
Speed Limit	80 km/h, which changes to 60 km/h to the north of Port Kembla Road.
Pedestrian Facilities	Footpaths are available: – Shared path along the southern side of the road to the east of Masters Road and along the eastern side of the road to the south of Masters Road. – Along the northern side of the road between Bridge Street and Tom Thumb Road. – Signal controlled pedestrian crossings are provided at all signal controlled intersections.
Bicycle Facilities	Shared paths are available: – Along the southern side of the road to the east of Masters Road and along the eastern side of the road to the south of Masers Road. – Along the western side of the road between Boral Asphalt access and Five Islands Road.
Public Transport	Bus stops are located on both sides, with bus routes: 37, 51, 53, 57, 65 operating from these stops.

Source: Google maps, modified by GHD

Five Islands Road (B65)

Five Islands Road (typical carriageway shown in Figure 4.6) is a state road, which forms part of the B65 between Wollongong and Port Kembla. It forms a signal-controlled intersection with Springhill Road and Flinders Street and provides a connection between the Princes Motorway and Port Kembla. It provides access to the PKSW via Cringila Car Park Road, Emily Road and Flagstaff Road.

Five Islands Road has the following key features outlined in Table 4.2.

Figure 4.6 Five Islands Road, viewed eastwards towards Springhill Road

Image Source: Google Street View

Table 4.2 Five Islands Road key features

Feature	Description	
Carriageway	Sealed dual carriageway with a raised centre median, with three traffic lanes in each direction.	 *Source: Google maps, modified by GHD*
Parking	Parking and stopping are restricted throughout the alignment.	
Speed Limit	80 km/h.	
Pedestrian Facilities	Footpaths are provided on both sides of the road at the following locations: – Between Springhill Road and Wattle Street. – Between Spring Road and the railway line overpass.	
Bicycle Facilities	A shared path is provided along the northern side of the road between Springhill Road and Flinders Street.	
Public Transport	Cringila Station is located on the northern side of Five Islands Road. Two bus stops are located approximately 45 metres to the south of Cringila Railway Station, with bus routes 27SC, 51 and 53 operating from these bus stops.	

Cringila Car Park Road

Cringila Car Park Road (typical carriageway shown in Figure 4.7) is a 250-metre local road, providing access to PKSW from Five Islands Road. It connects Five Islands Road in the south to Loop Road in the northwest and provides access to the project site car park.

Cringila Car Park Road has the following key features outlined in Table 4.3.

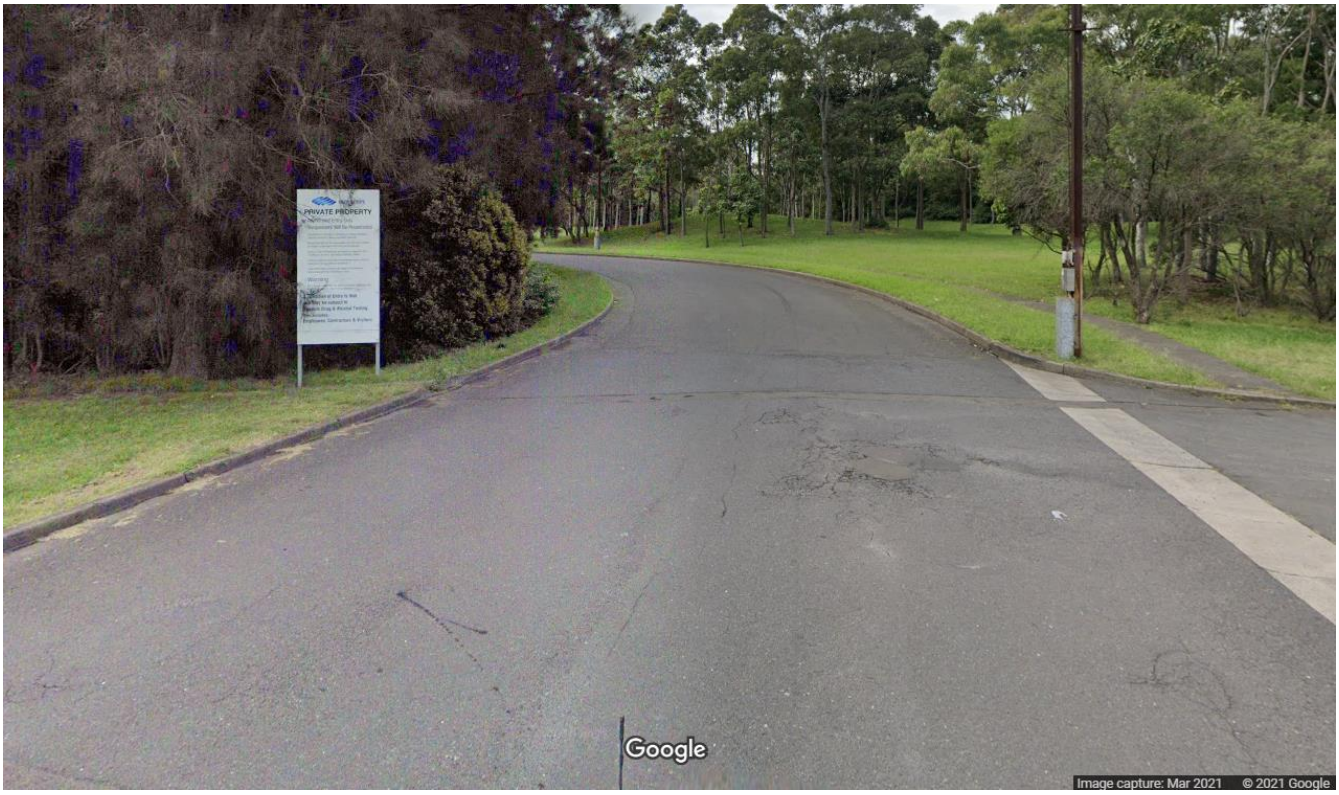
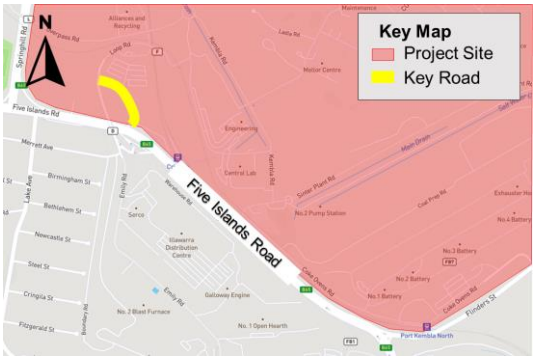


Figure 4.7 Cringila Car Park Road, viewed northwards towards Loop Road

Image Source: Google Street View

Table 4.3 Cringila Car Park Road key features

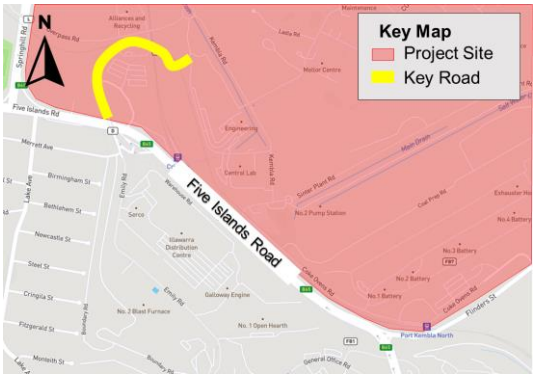
Feature	Description	
Carriageway	Sealed single carriageway with one lane in each direction. Divided by a 30-metre long median at the north-western end before the intersection with Loop Road.	 *Source: Google maps, modified by GHD*
Parking	There are no restrictions for parking and stopping throughout the alignment.	
Speed Limit	40 km/h	
Pedestrian Facilities	A shared path is provided along the eastern side of the road between Five Islands Road and Cringila Car Park.	
Bicycle Facilities		
Public Transport	There are no public transport facilities or services along this road.	

Loop Road

Loop Road is a local private road, providing a connection between Emily Road to the south and Central Road to the northeast.

Loop Road has the following key features outlined in Table 4.4.

Table 4.4 Loop Road key features

Feature	Description	
Carriageway	Sealed single carriageway with one lane in each direction.	 *Source: Google maps, modified by GHD*
Parking	There are no restrictions for parking and stopping throughout the alignment.	
Speed Limit	40 km/h	
Pedestrian Facilities	A shared path is provided along the southern side of the road between Cringila Car Park and Central Road.	
Bicycle Facilities		
Public Transport	There are no public transport facilities or services along this road.	

Emily Road

Emily Road (typical carriageway shown in Figure 4.8) is a short (approximately 120 metres) split, local private road, providing access to PKSW from Five Islands Road. It has two separate one-way roads from Five Islands Road that converge into a single carriageway at around 40 metres from Emily Road.

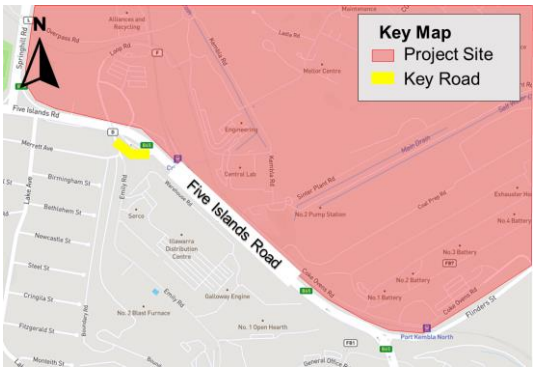
Emily Road has the key features outlined in Table 4.5.

Figure 4.8 Emily Road, viewed westwards towards Loop Road

Image Source: Google Street View

Table 4.5 Emily Road key features

Feature	Description
Carriageway	Sealed carriageway with one lane in each direction.
Parking	No posted restrictions for parking and stopping throughout the alignment, however the available lane width prevents vehicles from parking at least 3 m away from the double barrier road centre line and would thereby encroach the through traffic movement.
Speed Limit	40 km/h speed limit.
Pedestrian Facilities	There are no pedestrian facilities available on this road.
Bicycle Facilities	There are no bicycle facilities available on this road.
Public Transport	There are no public transport facilities or services along this road.



Source: Google maps, modified by GHD

BlueScope Access Road

BlueScope Access Road or PKS North Gate entrance (shown in Figure 4.9) is an approximately 180-metre local private road, which serves as one of the primary accesses to PKSW from Springhill Road. The BlueScope Access Road is the primary access for visitors accessing the PKSW via the BlueScope Steel Visitors Centre. It forms a signalised intersection with Springhill Road and is accessed from the northeast via a slip lane. It forms a roundabout intersection with Kembla Road, Hot Strip Road and Illawarra Road at its southern end.

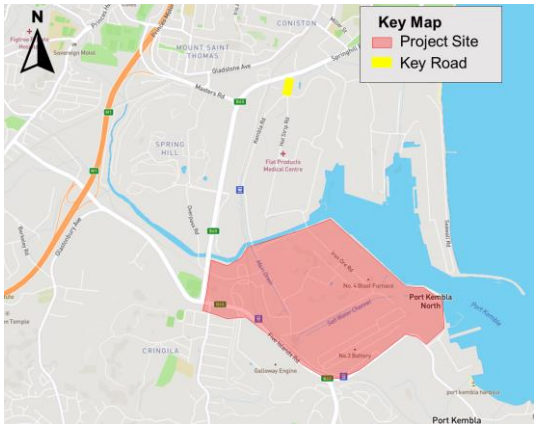
BlueScope Access Road has the following key features as outlined in Table 4.6.

Figure 4.9 BlueScope Access Road, viewed southwards

Image Source: Google Street View

Table 4.6 BlueScope Access Road key features

Feature	Description
Carriageway	Sealed carriageway, generally divided by a single barrier line. Varying traffic lanes (two to three) are provided in each direction.
Parking	Parking and stopping are restricted throughout the alignment. Provides access to the North Gate car park and visitor parking. Security boom gate restricts access to the wider PKSW site.
Speed Limit	50 km/h default urban speed limit.
Pedestrian Facilities	Shared paths are provided on both sides of the road.
Bicycle Facilities	There are no bicycle facilities available on this road.
Public Transport	There are no public transport facilities available on this road.



Source: Google maps, modified by GHD

Flagstaff Road

Flagstaff Road is a local road (typical carriageway shown in Figure 4.10) that runs in an approximately east-west alignment from Five Islands Road to Berkeley Road. It provides access from Five Islands Road to PKSW in the south.

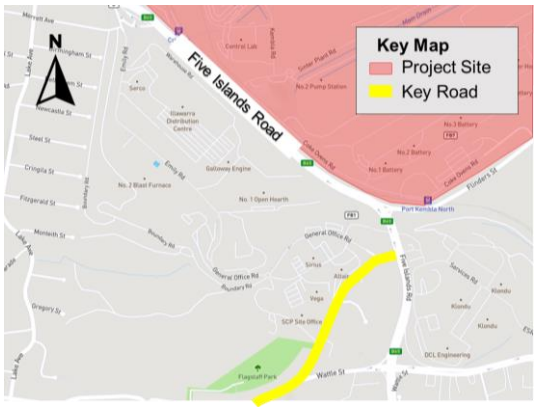
Flagstaff Road has the following key features as outlined in Table 4.7.

Figure 4.10 Flagstaff Road, viewed eastwards from Five Islands Road

Image Source: Google Street View

Table 4.7 Flagstaff Road key features

Feature	Description
Carriageway	Single sealed carriageway with one lane in each direction.
Parking	Parking is not restricted however stopping is prohibited throughout the alignment within the PKSW premises.
Speed Limit	40 km/h speed limit.
Pedestrian Facilities	There are no pedestrian facilities available on this road within the PKSW premises.
Bicycle Facilities	There are no bicycle facilities available on this road within the PKSW premises.
Public Transport	There are no public transport facilities available on this road within the PKSW premises.



Source: Google maps, modified by GHD

Old Port Road

OId Port Road (shown in Figure 4.11) is classified as a state road and provides access to industrial and port related land uses within the southern part of Port Kembla. At its southern end it forms a roundabout intersection with Foreshore Road and further to the south becomes Darcy Road. At its southern end, Darcy Road forms the minor approach to a priority “Stop” controlled intersection with Five Islands Road and Military Road.

Old Port Road has the following key features as outlined in Figure 4.8.

Figure 4.11 Old Port Road, viewed southwards from Flinders Street

Image Source: Google Street View

Table 4.8 Old Port Road key features

Feature	Description
Carriageway	Single sealed carriageway with one lane in each direction.
Parking	Unrestricted parking.
Speed Limit	60 km/h speed limit.
Pedestrian Facilities	A shared path is provided along the eastern side of the road to the north of Foreshore Road.
Bicycle Facilities	A shared path is provided along the eastern side of the road to the north of Foreshore Road.
Public Transport	Port Kembla Station is located to the west of Old Port Road, south of the intersection with Foreshore Road. One bus stop is located adjacent to the Port Kembla Station. Bus routes 34, 43 and 65 operate from this bus stop.

Source: Google maps, modified by GHD

4.3 Traffic volumes

4.3.1 Intersection traffic counts

GHD engaged Matrix Traffic and Transport Data Pty Ltd to undertake intersection traffic turning counts on Tuesday, 7 September 2021. The surveys were undertaken during the following time periods:

– Weekday AM peak (four hours): 5:00 am to 9:00 am.
– Weekday PM peak (two hours): 4:00 pm to 6:00 pm.

The intersection turning count surveys were undertaken at the following intersections:

– Cringila Car Park Road / Five Islands Road intersection (left in, left out only).
– Loop Road / Cringila Car Park Road intersection.

– Five Islands Road / Emily Road (Entry) intersection.
– Five Islands Road / Emily Road (Exit) intersection.
– Springhill Road / BlueScope Access Road signalised intersection.
– Five Islands Road / Flagstaff Road intersection (left in, left out only).

Analysis of the traffic survey data identified the following observed weekday AM and PM network peak hours:

– Weekday AM peak hour, between 7:45 am and 8:45 am.
– Weekday PM peak hour, between 4:00 pm and 5:00 pm.

A summary of the surveyed AM and PM peak hour traffic volumes for the above network peak hours is presented in Figure 4.12, Figure 4.13, Figure 4.14, and Figure 4.15 below. The full set of traffic count data is attached at Appendix A.

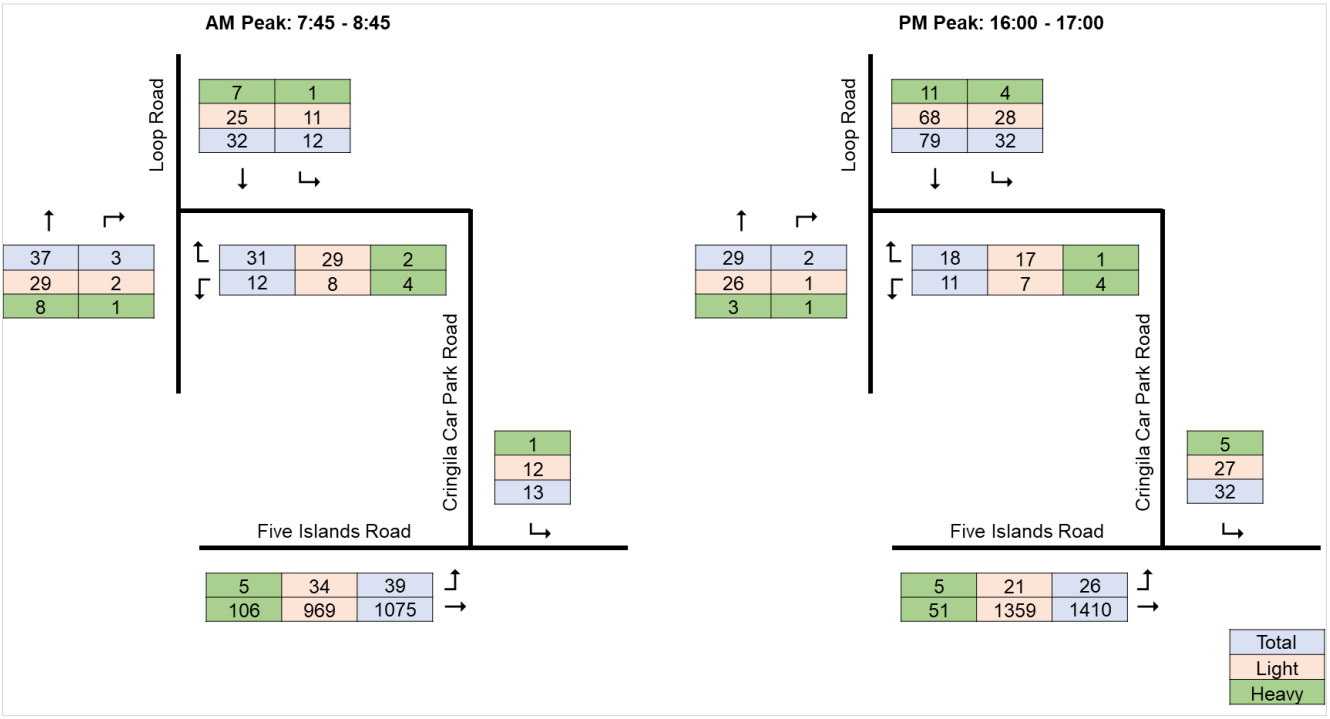


Figure 4.12 Loop Road and Cringila Car Park intersection and Five Islands Road and Cringila Car Park Road intersection traffic volume

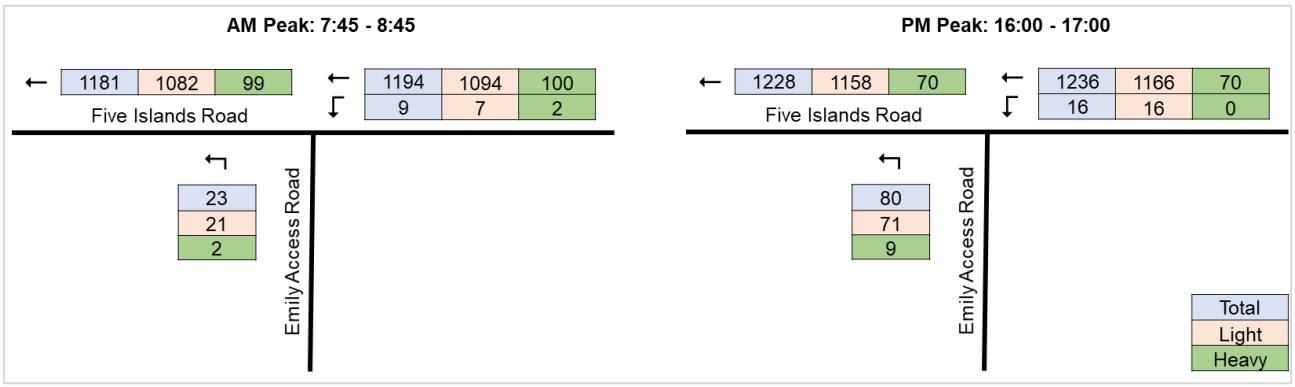


Figure 4.13 Five Islands Road and Emily Road intersections traffic volume

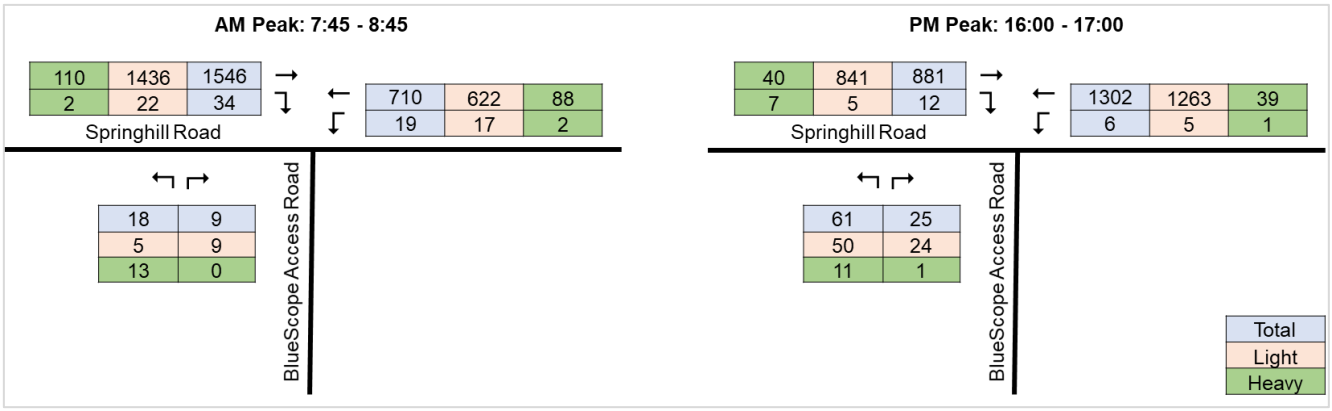


Figure 4.14 Springhill Road and BlueScope Access Road intersection traffic volume

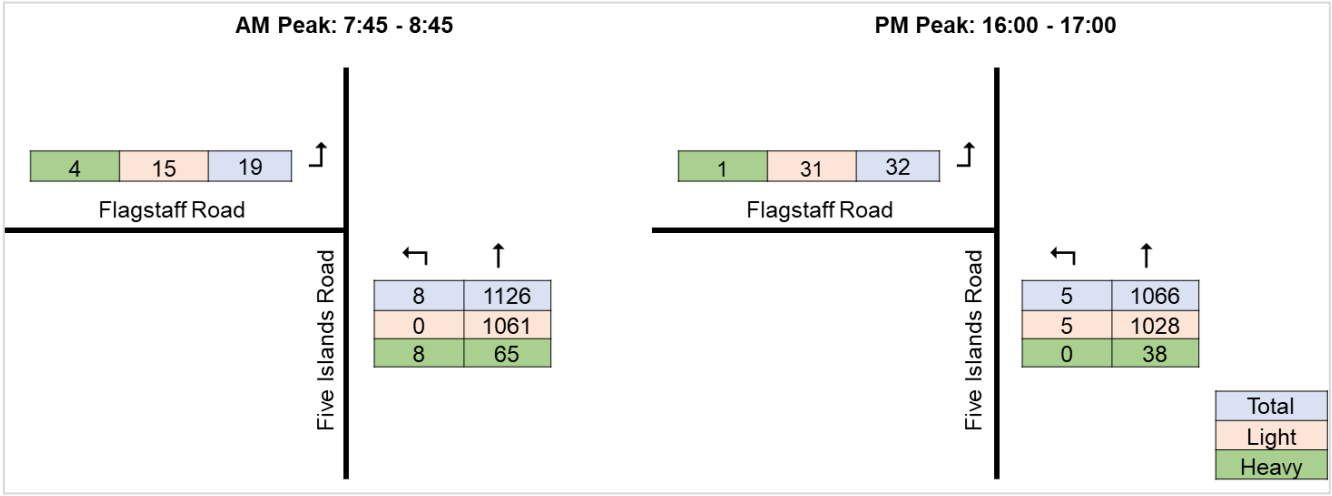


Figure 4.15 Flagstaff Road and Five Islands Road intersection traffic volume

It should be noted, however, that these traffic data do not reflect normal traffic conditions since the survey was undertaken during the lockdown period due to the COVID-19 pandemic, where only essential workers were able to travel to work. Access to the site was also restricted to one person per car. To quantify the effects of the pandemic in the road network and PKSW operations, the September 2021 traffic survey data has been compared with average gate entries / exits from the site recorded between 9 to 13 of September 2019 (using gate data provided by BlueScope) and with the traffic data from GHD's Port Kembla Gas Terminal TIA Report prepared in November 2018. Table 4.9 presents the difference between the data sets.

Table 4.9 Traffic Data Comparison

Location	Direction	Average 2019 Gate Entries / 2018 Traffic Survey		2021 Traffic Survey		% Difference	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Loop Road Gate	Entry	90	39	67	71	-26%	82%
	Exit	54	145	50	106	-7%	-27%
North Gate	Entry	68	21	47	68	-31%	224%
	Exit	34	97	25	55	-26%	-43%
Five Islands Road (northwest of Flinders Street)	NB/EB	2,186	1,838	1,114	1,436	-49%	-22%
	SB/WB	1,598	2,222	1,203	1,252	-25%	-44%
Springhill Road (southwest of Port Kembla Road)	NB/WB	1,366	649	1,555	906	14%	40%
	SB/EB	547	756	729	1,308	33%	73%

Analysis of the 2021 surveyed traffic volumes, compared to the historical pre COVID-19 pandemic data indicates:

– The number of vehicles entering the site via Loop Road has decreased by almost 30 per cent in the AM peak and increased by around 80 per cent in the PM peak.
– The number of vehicles departing via Loop Road has decreased by almost 10 per cent in the AM peak and by around 30 per cent in the PM peak.
– The number of vehicles entering via the North Gate has decreased by almost 30 per cent in the AM Peak but increased by more than 200 per cent in the PM peak.
– The number of vehicles departing via the North Gate has decreased by almost 30 per cent in the AM Peak and around 40 per cent in the PM peak.
– The number of eastbound vehicles passing through Springhill Road (southwest of Port Kembla Road) has increased by around 15 per cent in the AM peak and around 40 per cent in the PM peak.
– The number of westbound vehicles passing through Springhill Road (southwest of Port Kembla Road) has increased by around 30 per cent in the AM peak and around 70 per cent in the PM peak.
– The number of westbound vehicles passing through Five Islands Road (northwest of Flinders Street) has also decreased by almost 50 per cent in the AM peak and around 20 per cent in the PM peak.
– The number of eastbound vehicles passing through Five Islands Road (northwest of Flinders Street) has also decreased by around 20 per cent in the AM peak and 40 per cent in the PM peak.

To reflect the pre-pandemic traffic conditions for the subsequent analysis, 2021 surveyed traffic data were factored up utilising the 2018 surveyed traffic data and 2019 gate data provided by BlueScope except for the North Gate entries during the PM peak. The 2021 traffic survey data was utilised for this location to avoid reducing the traffic demands, to provide the most conservative assessment.

4.3.2 Functional classification

The classification of roads within the existing road network can be used as an indication of the functional role each road plays with respect to the volume of traffic they should appropriately carry. TfNSW has developed a set of road hierarchy classifications detailed in Table 4.10, which indicate typical nominal average annual daily traffic (AADT) volumes for various classes of roads.

Table 4.10 Functional classification of roads

Location	Traffic Volume (veh/d*)	Peak Hour Volume (veh/h*)
Motorway/Freeway	>15,000	>5,600
Arterial Road	>15,000	1,500 – 5,600
Sub-Arterial Road	5,000 – 20,000	500 – 2,000
Collector Road	2,000 – 10,000	200 – 1,000
Local Road	<2,000	0 – 200

Source: TfNSW, Road Design Guide and AMCORD
**Note veh/d = vehicles per day, veh/h = vehicles per hour*

Based upon the survey results presented above, the peak hour traffic volumes generally fall within the criteria provided in Table 4.10 for the relevant classification.

4.3.3 Mid-block capacity analysis

For the purposes of this assessment, a one-way mid-block capacity of 1,200 pc/h/lane has been adopted for the arterial roads, including Springhill Road and Five Islands Road, which is in keeping with the Austroads special conditions, which are reflective of the existing conditions. For Cringila Car Park Road, Loop Road, Emily Road, BlueScope Access Road, Flagstaff Road and Old Port Road, a one-way mid-block capacity of 900 pc/h/lane has been adopted.

Table 4.11 and Table 4.12 provide the VCR results for the existing AM and PM peak hours respectively. The following Passenger Car Units (PCU) factors have been applied to the survey, based on the PCU values provided in Table 10.1 in Roads and Maritime's *Traffic Modelling Guidelines* report (Roads and Maritime, 2013):

– Passenger car = 1.0.
– Light commercial vehicle = 1.0.
– Rigid heavy = 2.0.
– Heavy vehicles (if number of heavy articulated vehicles is unknown) = 2.5.
– Bus = 2.0.
– Articulated heavy = 4.0.

The data indicates that the key roads in the vicinity of the project are operating within the acceptable capacity for weekday morning and afternoon peak periods.

Table 4.11 Midblock volume / capacity analysis – AM peak hour

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCU)	V/C ratio
Springhill Road	Northeast of BlueScope Access Road	Eastbound	1,200	3	1,466	0.41
		Westbound	1,200	3	522	0.14
	Northwest of BlueScope Access Road	Eastbound	1,200	3	1,358	0.38
		Westbound	1,200	3	520	0.14
BlueScope Access Road	South of Springhill Road	Northbound	900	2	35	0.02
		Southbound	900	2	69	0.04
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	1,200	3	1,358	0.38
	Southwest of Cringila Car Park Road	Eastbound	1,200	3	1,394	0.39
	Southeast of Emily Road (Entry)	Westbound	1,200	3	1,800	0.50
	Northwest of Emily Road (Entry)	Westbound	1,200	3	1,791	0.50
	Northeast of Emily Road (Exit)	Westbound	1,200	3	1,772	0.49
	Northwest of Emily Road (Exit)	Westbound	1,200	3	1,795	0.50
	Northeast of Flagstaff Road	Northbound	1,200	3	1,708	0.47
	Southeast of Flagstaff Road	Northbound	1,200	3	1,697	0.47
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	900	1	51	0.06
		Southbound	900	1	14	0.02
	Southwest of Cringila Car Park	Eastbound	900	1	17	0.02
		Westbound	900	1	56	0.06

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCU)	V/C ratio
Loop Road	Northeast of Cringila Car Park Road	Northbound	900	1	88	0.10
		Southbound	900	1	45	0.05
	Southeast of Cringila Car Park Road	Northbound	900	1	51	0.06
		Southbound	900	1	48	0.05
Emily Road	South of Five Islands Road	Northbound	900	1	23	0.03
		Westbound	900	1	9	0.01
Flagstaff Road	East of Five Islands Road	Eastbound	900	2	19	0.01
		Westbound	900	2	8	0.00
Old Port Road[1]	North of Darcy Road	Northbound	900	1	91	0.10
		Southbound	900	1	87	0.10

Table 4.12 Midblock volume / capacity analysis – PM peak hour

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCU)	V/C ratio
Springhill Road	Northeast of BlueScope Access Road	Eastbound	1,200	3	599	0.17
		Westbound	1,200	3	397	0.11
	Northwest of BlueScope Access Road	Eastbound	1,200	3	541	0.15
		Westbound	1,200	3	442	0.12
BlueScope Access Road	South of Springhill Road	Northbound	900	2	84	0.05
		Southbound	900	2	18	0.01
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	1,200	3	2,016	0.56
	Southwest of Cringila Car Park Road	Eastbound	1,200	3	1,979	0.55
	Southeast of Emily Road (Entry)	Westbound	1,200	3	1,499	0.42
	Northwest of Emily Road (Entry)	Westbound	1,200	3	1,483	0.41
	Northeast of Emily Road (Exit)	Westbound	1,200	3	1,474	0.41
	Northwest of Emily Road (Exit)	Westbound	1,200	3	1,554	0.43
	Northeast of Flagstaff Road	Northbound	1,200	3	1,311	0.36
	Southeast of Flagstaff Road	Northbound	1,200	3	1,284	0.36

[1] Based on the traffic data from Port Kembla Gas Terminal Traffic Impact Assessment Report prepared by GHD in 2018

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCU)	V/C ratio
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	900	1	5	0.01
		Southbound	900	1	42	0.05
	Southwest of Cringila Car Park	Eastbound	900	1	44	0.05
		Westbound	900	1	6	0.01
Loop Road	Northeast of Cringila Car Park Road	Northbound	900	1	9	0.01
		Southbound	900	1	121	0.13
	Southeast of Cringila Car Park Road	Northbound	900	1	8	0.01
		Southbound	900	1	81	0.09
Emily Road	South of Five Islands Road	Northbound	900	1	80	0.09
		Westbound	900	1	16	0.02
Flagstaff Road	East of Five Islands Road	Eastbound	900	2	32	0.02
		Westbound	900	2	5	0.00
Old Port Road[2]	North of Darcy Road	Northbound	900	1	96	0.11
		Southbound	900	1	127	0.14

4.3.4 Historical traffic growth trends

Traffic count data from the TfNSW Traffic Volumes Viewer website was used to determine historical traffic growth trends for roads within the study area.

A summary of the historical average weekday traffic volumes at Five Islands Road, east of Springhill Road (TfNSW Count Station ID: 07097) is shown in Table 4.13. The historical traffic count data indicates that there has been a decline in traffic volume in the order of some ten per cent in this location between 2014 to 2018.

Table 4.13 Average weekday traffic volumes (24 hours) – Five Islands Road, east of Springhill Road

Direction	2014	2015	2016	2017	2018
Northbound	22,366	22,190	22,620	23,185	22,998
Southbound	22,815	23,009	22,852	17,776	17,625
Total	45,181	45,199	45,472	40,961	40,623

Source: TfNSW Traffic Volume Viewer website

4.4 Safety - crash data review

Road crash information from 2015 to 2019 in the following locations was collected from road crash statistics published by NSW Centre for Road Safety:

– Five Islands Road within approximately 100 metres from Emily Roads (both directions), as shown in Figure 4.16.
– Five Islands Road within approximately 100 metres from Flagstaff Road (both directions), as shown in Figure 4.17.
– Springhill Road within approximately 100 metres from BlueScope Access Road (both directions), as shown in Figure 4.18.

[2] Based on the traffic data from Port Kembla Gas Terminal Traffic Impact Assessment Report prepared by GHD in 2018

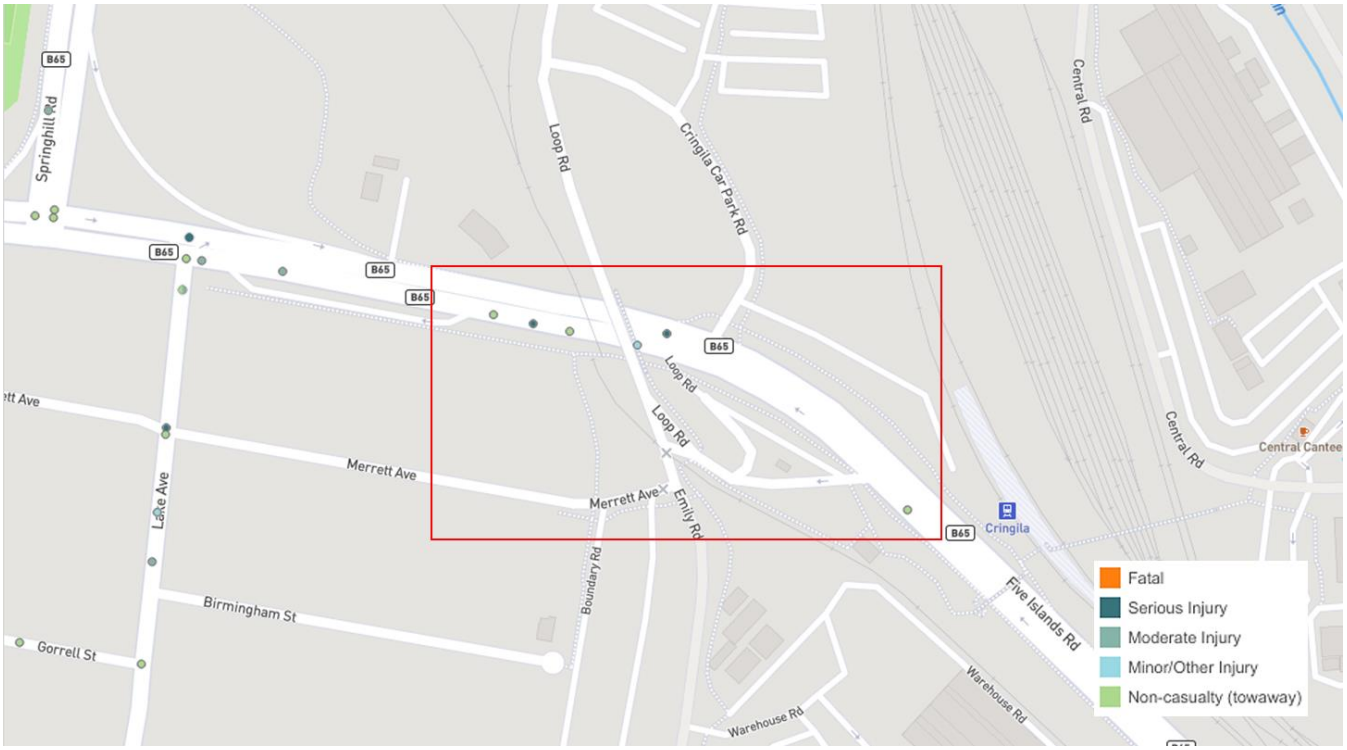


Figure 4.16 Crash locations (2015-2019) – Five Islands Road within approximately 100 metres from Emily Road

Source: Transport for NSW Centre for Road Safety modified by GHD

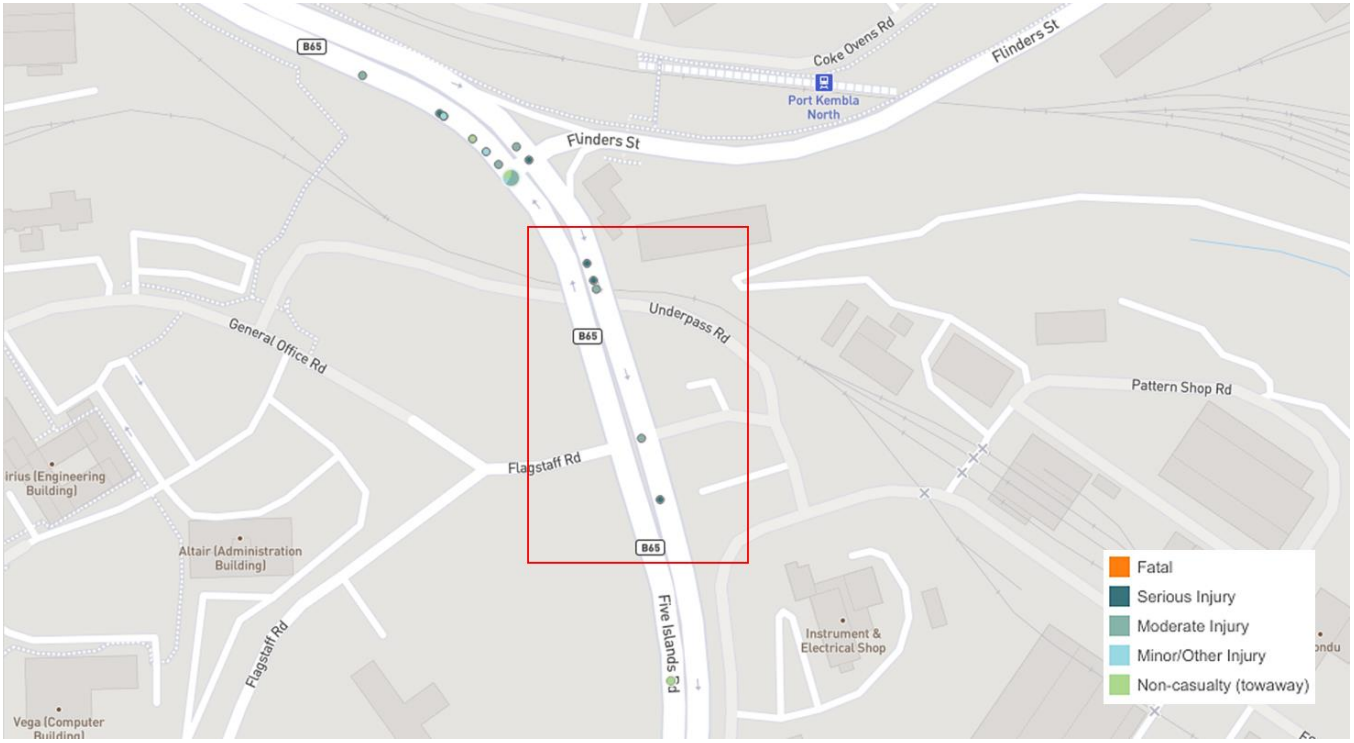


Figure 4.17 Crash locations (2015-2019) – Five Islands Road within approximately 100 metres from Flagstaff Road

Source: Transport for NSW Centre for Road Safety modified by GHD

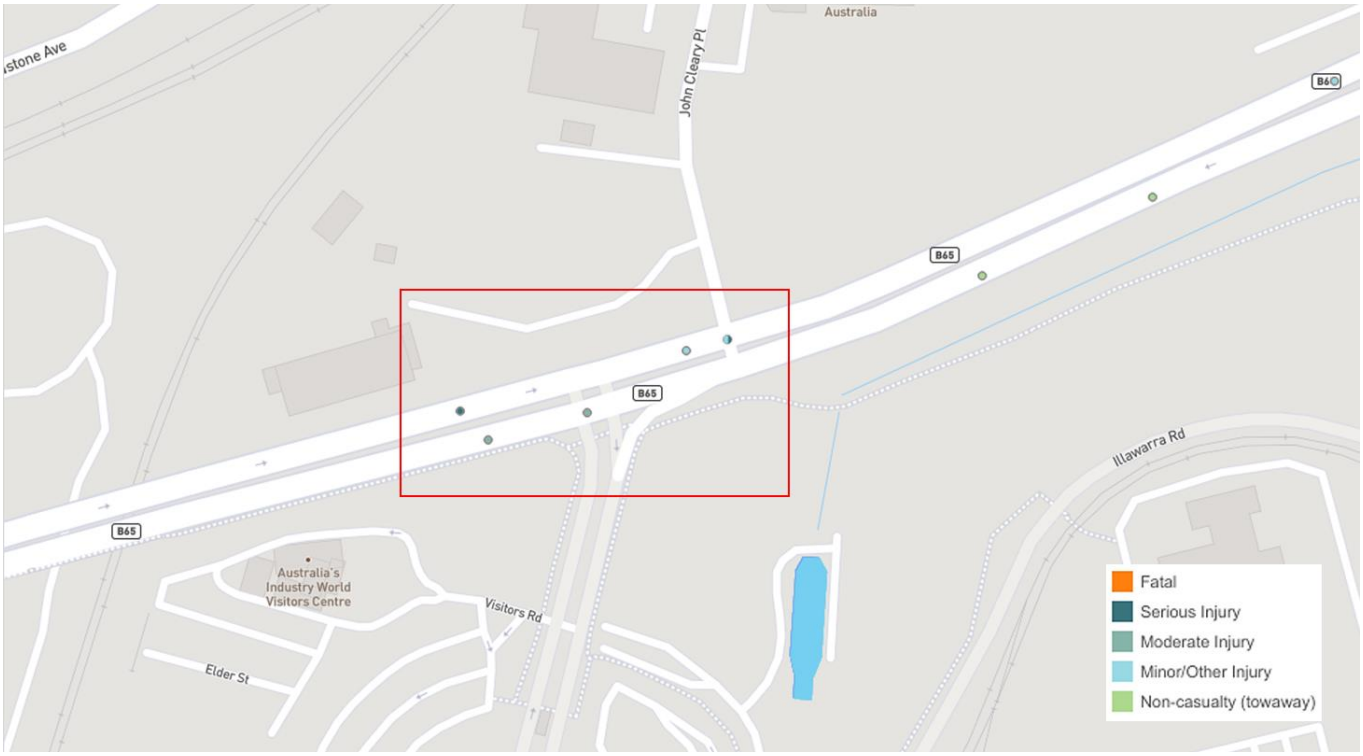


Figure 4.18 Crash locations (2015-2019) – Springhill Road within approximately 100 metres from BlueScope Access Road

Source: Transport for NSW Centre for Road Safety modified by GHD

From 2015 to 2019, 6 crashes were recorded near Five Islands Road and Emily Roads intersections, five crashes were recorded near Five Islands Road and Flagstaff intersection, and seven crashes were recorded near Springhill Road and BlueScope Access Road intersection. A summary of these crashes is presented in Table 4.14.

Table 4.14 Number of recorded crashes by road section (2015-2019)

Location	Number of Crashes	Number of Injuries			
		Fatal	Serious	Moderate	Minor
Five Islands Road within approximately 100 metres from Emily Road	6	0	2	0	1
Five Islands Road within approximately 100 metres from Flagstaff Road	5	0	3	2	0
Springhill Road within approximately 100 metres from BlueScope Access Road	7	0	2	3	2
Total	**18**	**0**	**7**	**5**	**3**

The predominant crash types are:

– Rear-end collisions and collisions with parked vehicles during daytime hours.

– Collisions with objects and parked vehicles on left and right hand bends at night.

These could be attributed to the reduced sight distance around the bends (when compared to straight alignment) or poor driver behaviour such as speeding and tailgating, among others.

4.5 Public and active transport

Active transport collectively refers to pedestrian traffic and commuter or recreational bicycle traffic. In reviewing the site and its accessibility to public transport opportunities, reference was made to the *NSW Planning Guidelines for Walking and Cycling (2004)*. This document outlines a recommended walkable distance of 400 metres to 800 metres to public transport and other local amenities or a 1.5 km bicycle riding distance.

Details of the accessibility to public transport, walking and bicycle riding access is provided in the following sections.

4.5.1 Train services and bus services

The closest stations to the project site are Cringila Station and Port Kembla North Station. These stations are served by the South Coast Line.

The nearest train stations and bus stops from the project site are shown in Figure 4.19. The bus routes and frequencies are presented in Table 4.15.

Figure 4.19 Train stations and bus stops locations

Source: Google Maps (2021), modified by GHD

Table 4.15 Bus services

Bus Number	Route	Day	Frequency
37	Wollongong to Shellharbour via Dapto (Loop Service)	Weekday	1 service per hour
		Saturday	1 service per hour
		Sunday and public holidays	1 service every 2 hours
51	Oak Flats to Wollongong via Stockland Shellharbour	Weekday	1 service per hour
		Saturday	1 service per hour
		Sunday and public holidays	1 service every 2 hours
53	Shellharbour to Wollongong	Weekday	1 service per hour
		Saturday:	1 service per hour
		Sunday and public holidays	1 service per hour
57	Wollongong to Shellharbour via Warrawong (Loop Service)	Weekday	1 service per hour
		Saturday	1 service per hour
		Sunday and public holidays	1 service every 2 hours
65	North Wollongong to Port Kembla (Loop Service)	Weekday	1 service per hour
		Saturday	1 service per hour
		Sunday and public holidays	1 service every 2 hours

4.5.2 Walking and cycling

Active transport facilities in proximity to the project site are limited to footpaths / shared paths along Springhill Road, Five Islands Road, Cringila Car Park Road, Old Port Road, and BlueScope Access Road. The off-road bicycle (shared path) routes in the vicinity of the site, including along Springhill Road, Five Islands Road and Old Port Road, are presented in Figure 4.20. There are neither pedestrian nor bicycle facilities along Emily Road and Flagstaff Road within the PKSW premises.

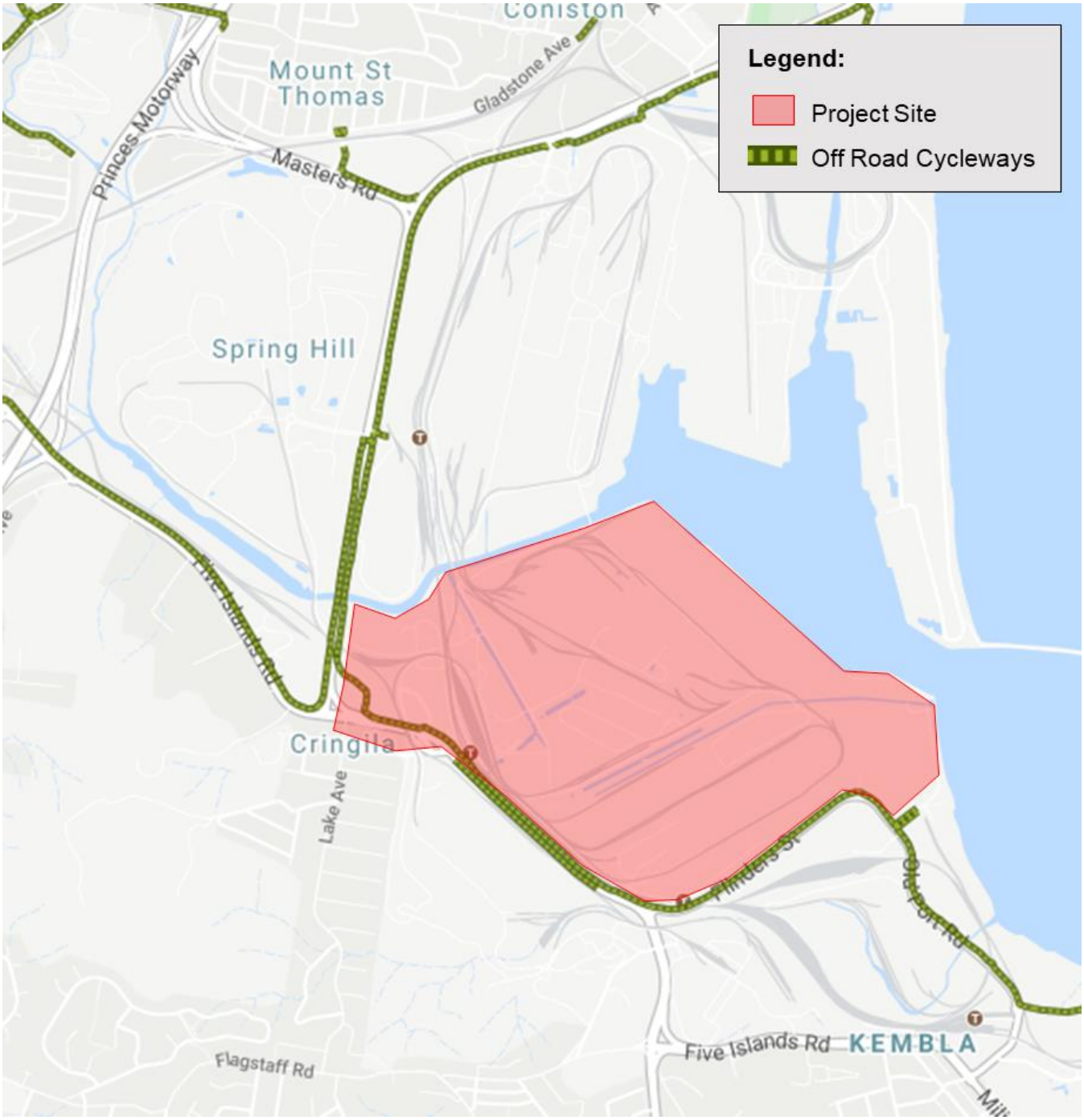


Figure 4.20 Existing bicycle network

TfNSW Cycleway Finder (2021), modified by GHD

5. Construction activities

Major construction work will be required within the blast furnace and surrounding facilities and will involve removing the remaining burden materials, refractory bricks and blocks and staves within the interior of the blast furnace for replacement. Any required repairs or replacement of ancillary equipment or structures will also be carried out.

Construction activities will indicatively involve the following tasks:

- Removal of the remaining burden materials.
- Removal of the iron skull.
- Removal of worn carbon block refractories in the hearth.
- Removal of worn refractories in the remainder of the vessel.
- Demolition of other equipment including:
  - Cooling staves which protect the blast furnace shell.
  - Hot blast main refractory lining where required, including the expansion joints.
  - Clarifier tank and associated equipment where required.
- Repairs to the blast furnace shell where required.
- Installation of a new clarifier tank and associated equipment.
- Installation of the new hearth, sidewall refractories and staves.
- Repair / replacement of tuyeres, tapholes and instrumentation.
- Repair, maintenance and/or upgrade of ancillary equipment including:
  - Furnace cooling systems.
  - Hot blast system including the stoves, with the addition of stove waste gas heat recovery (WGHR) system.
  - Gas system, with addition of a top gas recovery turbine (TRT).
  - Furnace top, including the charging equipment, bleeder valves and outrigger crane.
  - Casthouse floors and associated equipment.
  - Stockhouse (raw materials feed system).
  - Rail works (product delivery system).
  - Automation and power systems.
  - Services.
- Installation of a new slag granulation system.
- Shutdown and make-safe of 5BF.
- Commissioning and ramp up of 6BF operations.

5.1 Construction program

A summary of the construction staging and duration for each of the construction activities is provided in Table 5.1.

Table 5.1 Construction staging

Stage	Activities	Approximate Duration
1	– Procurement of long-lead time items (hearth, refractories, staves) initiated. – Progress with refurbishment activities that do not require long-lead items. – Early works commences for enabling activities. Includes cranes, lifts, casthouse roof replacement, drainage, construction facilities.	24 to 30 months
2	– Construction phase 1 activities including demolition, civils, stockhouse, slag handling, hot blast system, gas system, cooling system, wreck out of furnace, furnace top. – Control system and automation upgrade.	24 months
3	– Initiated with twelve months advance notice of end of 5BF operations. – Construction phase 2 activities including relining of furnace. – Complete in parallel with latter stages of phase 1 depending on timing of 5BF shutdown. – Pre-commissioning and commissioning of 6BF	12 months
4	– Managed transition of operations from 5BF to 6BF with ramp-down of 5BF followed by ramp-up production of 6BF. – 5BF decommissioned and made safe on ceasing operation.	1 month

5.2 Workforce

5.2.1 Workforce

The 6BF reline methodology allows reline activities to be completed in a measured way requiring a smaller construction workforce when compared to a 5BF multi-month reline outage.

Labour requirements for the 6BF reline model will be modest and will be mostly satisfied by local contractors. Across the duration of the project, a workforce of approximately 250 full time equivalent (FTE) workers will be required. As outlined in Section 5.4 a conservative number of 300 light vehicles accessing the site has been assumed in this assessment. If 6BF is required online earlier than 2026 for strategic, operational or safety reasons, this workforce size may be increased to complete the work in a reduced timeframe. The required increase in the workforce would be dependent on the timeframe required to complete the remaining works, however, this may result in a maximum of up to 1,000 workers being required, equivalent to what might be needed during a traditional reline.

During operation, it is anticipated that workforce requirements will not change significantly from existing operations with the 5BF workforce of approximately 105 to 110 FTE workers transferring to 6BF once operational.

5.2.2 Working hours

Authorisation for 24-hour construction is being sought as part of the request for planning approval.

Where practical, and subject to the final construction timetable, construction will be carried out during the following construction hours:

– Monday to Friday: 7.00 am to 6.00 pm.
– Saturday: 7.00 am to 6.00 pm.
– Sundays and public holidays: no work.

However, there will be a number of construction activities scheduled to be undertaken as night works to manage interaction with the remainder of the PKSW operations and the higher day-shift workforce.

Where practical, noise generating activities with the potential to impact any nearby receivers will be scheduled during standard hours.

Final installation of components inside the blast furnace and other residual construction activities will require 24-hour construction (estimated to be a period of five months). Further, 24-hour construction may be required for an extended period to speed up the completion of construction if 6BF is required online earlier than 2026.

During the 6BF commissioning period, each of the separate sub-systems of the furnace will be trial run and tested for safe operation. There will be no concurrent ironmaking operation of both 5BF and 6BF.

5.3 Construction equipment

Much of the equipment and materials required for the project has a long lead time for procurement. Specific types and quantities of equipment will be determined during project planning. An indicative list of the plant and equipment expected to be used during construction is provided in Table 5.2. Equipment will be sourced from onsite and also brought to site by contractors as required. Larger equipment will require heavy vehicle transportation.

Table 5.2 Indicative construction equipment

Construction equipment			
Excavators ranging from 5t to 40t	Bobcats (skid steer loaders)	Water blasters	Rail tamper
Cranes of various capacity ranging from 15t to 800t	Rock breaker	Grit blasters	Various brick saws and mixers
Dump trucks	Explosives equipment	Semi-trailers	Material hoists and winches
Front end loaders	Air compressors	Abbey hoists	Refractory gunning machine
Telescopic boom excavator	Diesel welders	Forklifts	Temporary stove burners, fuel pipe and fans.
Liquids tankers	Welding Machines	Sykes pumps	Alimak passenger and goods lifts
Tear-Out machine	Temporary conveyors	Temporary Oxygen, Acetylene, LPG, Argon, Nitrogen welding and cutting gases	Scaffolding
Boom and scissor lifts	Vacuum loading (suck) trucks	Concrete mixers	Concrete pumps
Fuel trucks	Flat Bed Trucks	Road Rollers	Piling Rigs
Concrete Saw	Plate compactors	-	-

5.4 Traffic generation

The construction of the project is expected to generate:

– Approximately 300 light vehicles per day, comprising of contractors and construction personnel vehicles, which will result in 600 light vehicle movements per day (300 arrivals and 300 departures). These vehicles are expected to arrive between 5:00 am to 6:00 am and depart between 4:00 pm to 6:00 pm.

- It is estimated that around ninety to ninety-five percent of the expected light vehicle movements would be directed to park in the central car park via Cringila Car Park Access Road. Some contractors and visitors may also use this access to the car park, where they will then be transported via minibus through the gate at Loop Road.
- The remaining five percent of light vehicle movements are assumed to enter and exit via the North Gate.

– Up to 50 buses per day resulting in 100 bus movements per day via Cringila Car Park Road. These buses will be used to transport workers within PKSW premises e.g. from central car park to construction site and vice versa. Potential bus pick-up and drop-off points are presented in Figure 5.1. It should be noted, however, that only the pick-up and drop-off point at central car park has an existing lay-by. It is therefore recommended to provide temporary bus stop facilities and implement appropriate traffic controls at these locations.
– Between 50 and 100 trucks per day (depending upon the phase of construction works), resulting in between 100 and 200 truck movements per day.

This traffic generation is considered to be low and within the daily fluctuation in traffic at roads in the surrounding road network. The construction activities are therefore expected to have negligible traffic impacts.

As noted in Section 5.2.1, should the operation life of 5BF end sooner than currently planned then an increase from 300 to a maximum of 1000 staff per day may be required. Should this occur, these staff would change from a single day shift to 24 hour construction. This would spread the increased number of worker movements across a 24 hour period. Therefore, the assessment of 300 light vehicle movements assessed in Section 6.1 are considered representative of worst case peak hour movements.

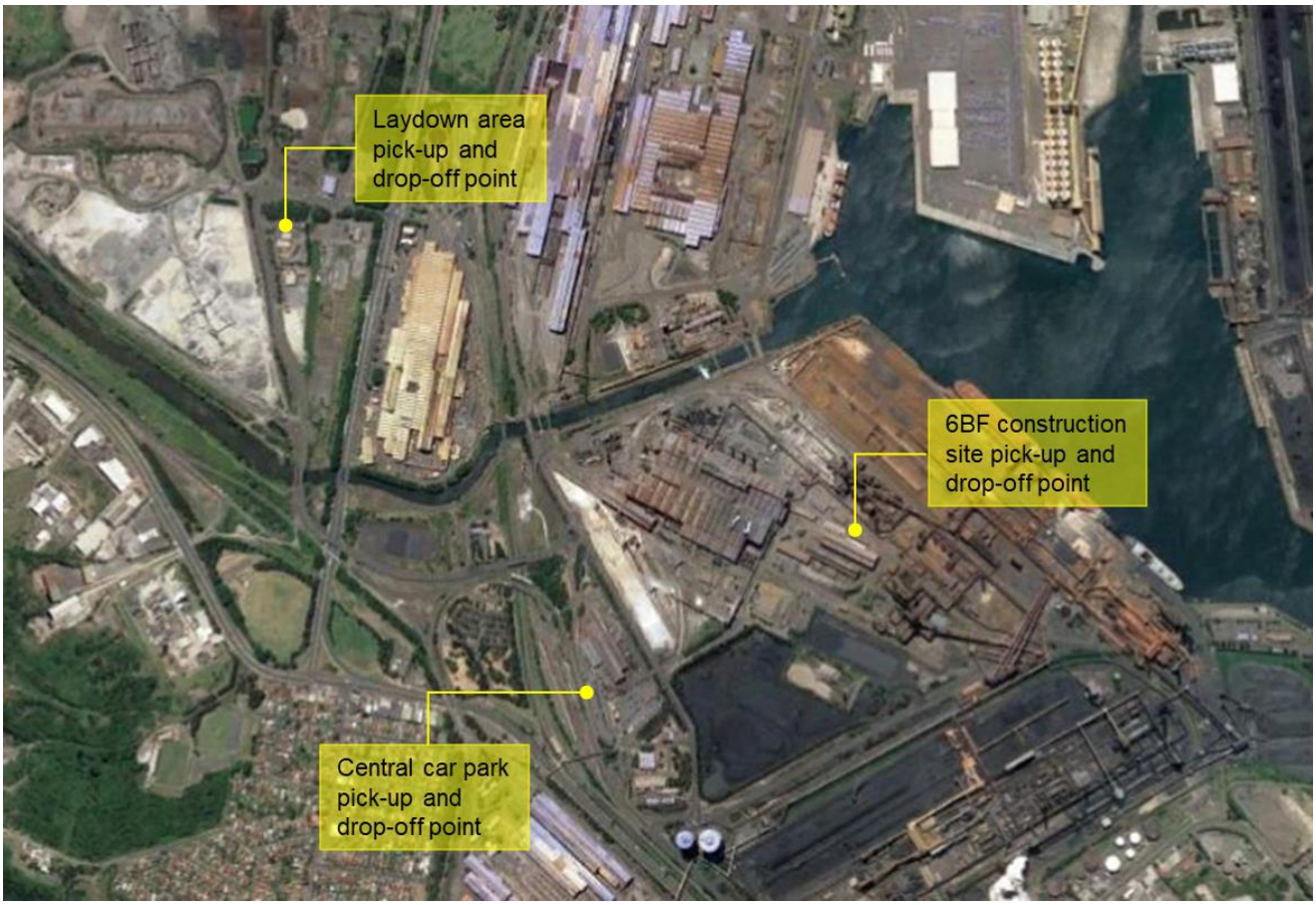


Figure 5.1 Indicative pick-up and drop-off points

Based on conservative estimates, the expected peak traffic generation for the construction activities is summarised in Table 5.3.

Table 5.3 Traffic generation – two-way traffic

	Daily traffic generation (vehicles)	Peak Hour traffic generation (vehicles)
Light vehicles	600	300
Heavy vehicles	300	30
Total	900	330

5.5 Construction vehicle access routes

Three typical construction traffic access routes have been considered for the purpose of this assessment. These include the following routes and are shown in Figure 5.2:

- **Route 1:** access to laydown area via Cringila Car Park Road. Vehicles to depart at Emily Road / Five Islands Road intersection.
- **Route 2:** access to laydown area via Flagstaff Road and Five Islands Road intersection.
- **Route 3:** access to laydown area and construction site via Flinders Street, Stockpile Road and Old Port Road.

A summary of these routes is provided in Table 5.4.

Internal roads that will be used for access to laydown areas and construction site are shown in Figure 5.3

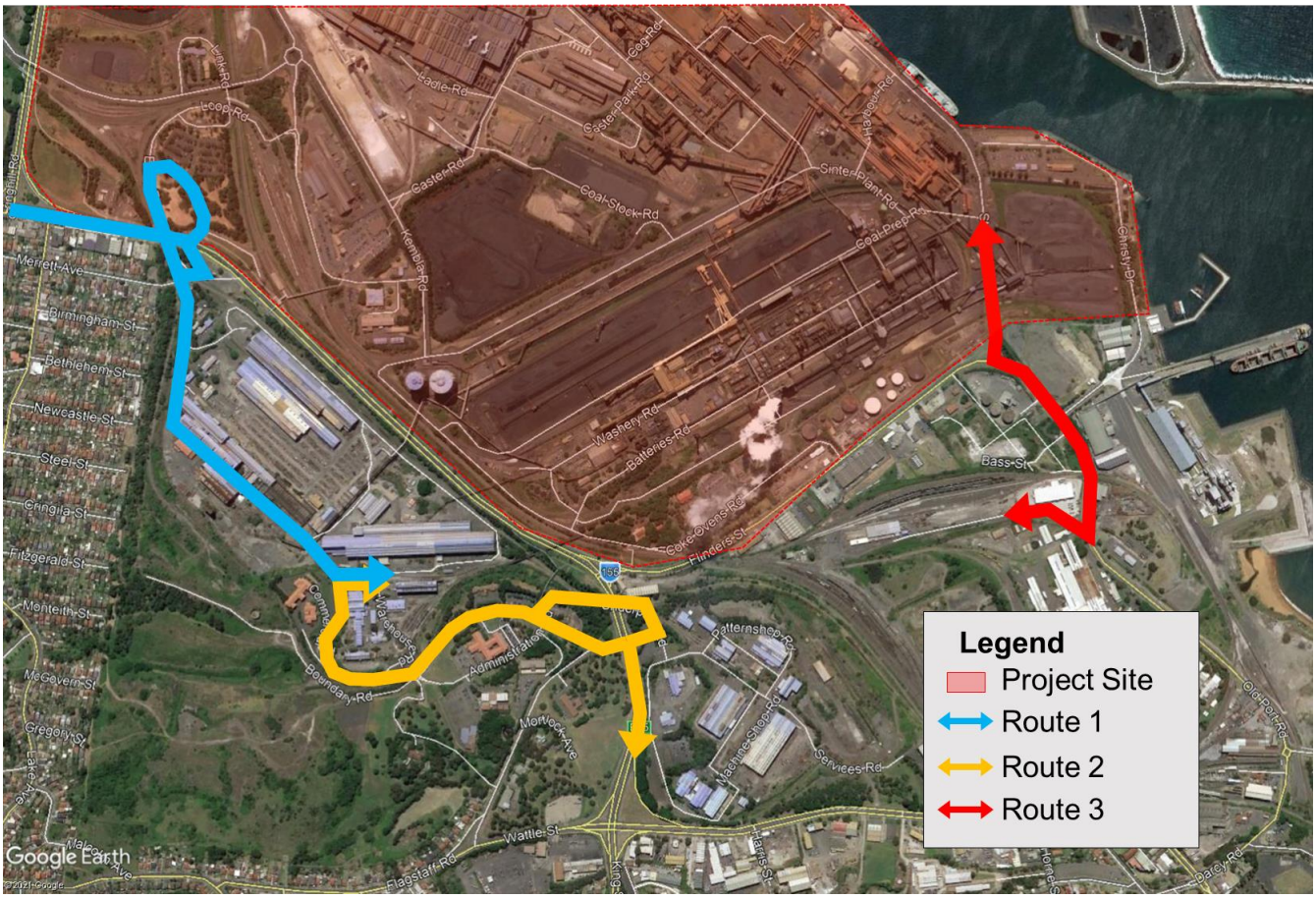


Figure 5.2 Construction Traffic Routes

Source: Google maps (2021), modified by GHD

Table 5.4 Construction access routes to each construction site

Route ID	From	To	Route	Assumptions
1A	Wollongong	PKSW project site	Princes Motorway (SB) Five Islands Road (EB) Cringila Car Park Road (NB) Loop Road (SB) Emily Road (SB)	– Trips on Princes Motorway assumed to be split 50/50 – 70% of HV trips generated – 70% of 95% of LV trips generated
1B	PKSW project site	Wollongong	Emily Road (NB) Emily Road (NB) Five Islands Road (WB) Princes Motorway (NB)	– Trips on Princes Motorway assumed to be split 50/50 – 70% of HV trips generated – 70% of 95% of LV trips generated
2A	Port Kembla	PKSW project site	Five Islands Road (NB) Flagstaff Road (WB) General Office Road (WB) Emily Road (NB)	– 30% of HV trips generated – 30% of 95% of LV trips generated
2B	PKSW project site	Port Kembla	Emily Road (SB) General Office Road (EB) Underpass Road (EB) / Flagstaff Road (EB) Five Islands Road (SB) / Five Islands Road (NB)	– 30% of HV trips generated – 30% of 95% of LV trips generated
3	PKSW project site	Other PKSW locations	Old Port Road	– Along Old Port Road
4	PKSW project site	Other PKSW locations	Internal PKSW roads only	– Internal only

Paper Size ISO A4

0 0.2 0.4 0.6 0.8

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

BlueScope Steel Ltd
No.6 Blast Furnace Reline and Operations
Traffic Impact Assessment

Internal roads used during reline activities

Project No. **12541101**
Revision No. **0**
Date **21/10/2021**

FIGURE 5-3

G:\22\12541101\GIS\Maps\12541101_TrafficImpactAssessment_0.aprx\12541101_TIA004_InternalRoad_0
Print date: 22 Oct 2021 - 17:56

Data source: BlueScope: Internal roads layout, 2021. LPI: DCDB/DTDB, 2017. World Imagery: Maxar.
Created by: tmorton

6. Traffic impact assessment

This section outlines the traffic implications during the construction and operation of the project.

6.1 Construction impacts

6.1.1 Traffic impacts

Based on the traffic generation and traffic distributions outlined in Sections 5.4 and 5.5, the following sections summarise the expected increase in daily and peak hour traffic during peak construction activities. This peak construction period is expected to occur at the same time for a period of up to three years.

Daily traffic construction traffic

The expected increase in daily traffic associated with the peak construction activity for the project is summarised in Table 6.1 and the expected increase in peak hour traffic is summarised in Table 6.2.

It should be noted that peak hour traffic generation is associated with light vehicle movements during shift changeover periods. Light vehicle movements during other times of the day are expected to be minimal. Outside of shift change over hours, the construction of the project would result in an increase of around 30 two-way heavy vehicle movements per hour.

Table 6.1 Increase in construction traffic generation – daily traffic

Road	Location	Direction	Light vehicles	Heavy vehicles	Total vehicles
Springhill Road	Northeast of BlueScope Access Road	Eastbound	0	40	40
		Westbound	4	0	4
	Northwest of BlueScope Access Road	Eastbound	11	0	11
		Westbound	11	0	11
BlueScope Access Road	South of Springhill Road	Northbound	15	0	15
		Southbound	15	0	15
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	0	0	0
	Southwest of Cringila Car Park Road	Eastbound	200	110	310
	Southeast of Emily Road (Entry)	Westbound	0	0	0
	Northwest of Emily Road (Entry)	Westbound	0	0	0
	Northeast of Emily Road (Exit)	Westbound	0	0	0
	Northwest of Emily Road (Exit)	Westbound	200	110	310
	Northeast of Flagstaff Road	Northbound	0	0	0
	Southeast of Flagstaff Road	Northbound	170	80	250

Road	Location	Direction	Light vehicles	Heavy vehicles	Total vehicles
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	200	110	310
		Southbound	0	0	0
	Southwest of Cringila Car Park	Eastbound	200	110	310
		Westbound	0	0	0
Loop Road	Northeast of Cringila Car Park Road	Northbound	285	0	285
		Southbound	285	0	285
	Southeast of Cringila Car Park Road	Northbound	85	0	85
		Southbound	285	110	395
Emily Road	South of Five Islands Road	Northbound	200	110	310
		Westbound	0	0	0
Flagstaff Road	East of Five Islands Road	Eastbound	170	80	250
		Westbound	0	0	0
Old Port Road	North of Darcy Road	Northbound	0	150	150
		Southbound	0	150	150

Table 6.2 Peak hour (AM and PM) construction traffic generation on the surrounding road network

Road	Location	Direction	Light vehicles	Heavy vehicles	Total vehicles
Springhill Road	Northeast of BlueScope Access Road	Eastbound	0	4	4
		Westbound	4	0	4
	Northwest of BlueScope Access Road	Eastbound	11	0	11
		Westbound	11	0	11
BlueScope Access Road	South of Springhill Road	Northbound	15	0	15
		Southbound	15	0	15
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	0	0	0
	Southwest of Cringila Car Park Road	Eastbound	200	11	211
	Southeast of Emily Road (Entry)	Westbound	0	0	0
	Northwest of Emily Road (Entry)	Westbound	0	0	0
	Northeast of Emily Road (Exit)	Westbound	0	0	0
	Northwest of Emily Road (Exit)	Westbound	200	11	211
	Northeast of Flagstaff Road	Northbound	0	0	0
	Southeast of Flagstaff Road	Northbound	170	8	178

Road	Location	Direction	Light vehicles	Heavy vehicles	Total vehicles
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	200	11	211
		Southbound	0	0	0
	Southwest of Cringila Car Park	Eastbound	200	11	211
		Westbound	0	0	0
Loop Road	Northeast of Cringila Car Park Road	Northbound	285	0	285
		Southbound	285	0	285
	Southeast of Cringila Car Park Road	Northbound	85	0	85
		Southbound	285	11	296
Emily Road	South of Five Islands Road	Northbound	200	11	211
		Westbound	0	0	0
Flagstaff Road	East of Five Islands Road	Eastbound	170	8	178
		Westbound	0	0	0
Old Port Road	North of Darcy Road	Northbound	0	15	15
		Southbound	0	15	15

Midblock assessment

For a highly conservative midblock assessment of the proposal, the peak hour construction traffic movements have been added to the observed road network AM and PM peak hour traffic volumes. However, it should be noted that during the AM peak, the network peak hour was observed to be between 7:45 am and 8:45 am although the construction traffic peak hour is expected to be between 5:00 am and 6:00 am.

Additionally, the PM peak for staff light vehicle movements is expected to occur over a two hour period, with light vehicles departing the site between 4:00 pm to 6:00 pm. However, for a conservative assessment, it has been assumed that all staff would depart during the network peak hour.

Table 6.3 and Table 6.4 provide the VCR results for the AM and PM peak hours respectively for the peak construction period. As stated above, this is a highly conservative assessment, given that the peak hours for the construction traffic generation would not occur during the surrounding road network peak hours.

The data indicates that the majority of key roads in the vicinity of the project are expected to operate well within the acceptable capacity for weekday morning and afternoon peak periods.

Impacts to the M1 Princes Motorway are expected to be minimal given that this is a state Highway that caters for high traffic volumes.

Table 6.3 Peak construction midblock volume / capacity – AM peak hour

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCUs)	V/C ratio
Springhill Road	Northeast of BlueScope Access Road	Eastbound	1,200	3	1,466	0.41
		Westbound	1,200	3	626	0.17
	Northwest of BlueScope Access Road	Eastbound	1,200	3	1,544	0.43
		Westbound	1,200	3	638	0.18
BlueScope Access Road	South of Springhill Road	Northbound	900	2	60	0.03
		Southbound	900	2	126	0.07

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCUs)	V/C ratio
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	1,200	3	1,558	0.43
	Southwest of Cringila Car Park Road	Eastbound	1,200	3	2,058	0.57
	Southeast of Emily Road (Entry)	Westbound	1,200	3	2,028	0.56
	Northwest of Emily Road (Entry)	Westbound	1,200	3	2,016	0.56
	Northeast of Emily Road (Exit)	Westbound	1,200	3	1,994	0.55
	Northwest of Emily Road (Exit)	Westbound	1,200	3	2,020	0.56
	Northeast of Flagstaff Road	Northbound	1,200	3	1,860	0.52
	Southeast of Flagstaff Road	Northbound	1,200	3	2,045	0.57
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	900	1	515	0.57
		Southbound	900	1	16	0.02
	Southwest of Cringila Car Park	Eastbound	900	1	247	0.27
		Westbound	900	1	295	0.33
Loop Road	Northeast of Cringila Car Park Road	Northbound	900	1	678	0.75
		Southbound	900	1	57	0.06
	Southeast of Cringila Car Park Road	Northbound	900	1	239	0.27
		Southbound	900	1	121	0.13
Emily Road	South of Five Islands Road	Northbound	900	1	26	0.03
		Westbound	900	1	12	0.01
Flagstaff Road	East of Five Islands Road	Eastbound	900	2	120	0.07
		Westbound	900	2	115	0.06
Old Port Road	North of Darcy Road	Northbound	900	1	129	0.14
		Southbound	900	1	125	0.14

**veh = vehicles, hr = hour, PCU = passenger car units, V/C = volume to capacity ratio*
Note, PCU factors = 1 for light vehicles, 2 for heavy vehicles (or 2.5 if the number of B-Doubles is unknown) and 4 for B-Doubles

Table 6.4 Peak construction midblock volume / capacity analysis – PM peak hour

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCUs)	V/C ratio
Springhill Road	Northeast of BlueScope Access Road	Eastbound	1,200	3	613	0.17
		Westbound	1,200	3	416	0.12
	Northwest of BlueScope Access Road	Eastbound	1,200	3	587	0.16
		Westbound	1,200	3	496	0.14
BlueScope Access Road	South of Springhill Road	Northbound	900	2	130	0.07
		Southbound	900	2	30	0.02
Five Islands Road	Southeast of Cringila Car Park Road	Eastbound	1,200	3	2,132	0.59
	Southwest of Cringila Car Park Road	Eastbound	1,200	3	2,088	0.58
	Southeast of Emily Road (Entry)	Westbound	1,200	3	1,625	0.45

Road	Location	Direction	Capacity (veh/hr/lane)	Number of lanes	Total vehicles (PCUs)	V/C ratio
	Northwest of Emily Road (Entry)	Westbound	1,200	3	1,609	0.45
	Northeast of Emily Road (Exit)	Westbound	1,200	3	1,600	0.44
	Northwest of Emily Road (Exit)	Westbound	1,200	3	2,148	0.60
	Northeast of Flagstaff Road	Northbound	1,200	3	1,381	0.38
	Southeast of Flagstaff Road	Northbound	1,200	3	1,448	0.40
Cringila Car Park Road	Southeast of Cringila Car Park	Northbound	900	1	7	0.01
		Southbound	900	1	51	0.06
	Southwest of Cringila Car Park	Eastbound	900	1	54	0.06
		Westbound	900	1	7	0.01
Loop Road	Northeast of Cringila Car Park Road	Northbound	900	1	11	0.01
		Southbound	900	1	715	0.79
	Southeast of Cringila Car Park Road	Northbound	900	1	11	0.01
		Southbound	900	1	669	0.74
Emily Road	South of Five Islands Road	Northbound	900	1	549	0.61
		Westbound	900	1	16	0.02
Flagstaff Road	East of Five Islands Road	Eastbound	900	2	214	0.12
		Westbound	900	2	5	0.00
Old Port Road	North of Darcy Road	Northbound	900	1	134	0.15
		Southbound	900	1	165	0.18

**veh = vehicles, hr = hour, PCU = passenger car units, V/C = volume to capacity ratio*
Note, PCU factors = 1 for light vehicles, 2 for heavy vehicles (or 2.5 if the number of B-Doubles is unknown) and 4 for B-Doubles

6.1.2 Intersection performance

The following key intersections within the study area have been assessed using the SIDRA 8 intersection modelling software, as these intersections provide access to the project site:

– Cringila Car Park Road / Five Islands Road intersection (left in, left out only).
– Loop Road / Cringila Car Park Road intersection.
– Five Islands Road / Emily Road (Entry) intersection.
– Five Islands Road / Emily Road (Exit) intersection.
– Springhill Road / BlueScope Road signalised intersection.
– Five Islands Road / Flagstaff Road intersection (left in, left out only).

The intersection traffic modelling has been undertaken for the following weekday peak hour periods, to coincide with the construction traffic generation peak hours for the project, which is associated with the shift changeover periods:

– AM peak – between 7:45 am and 8:45 am.
– PM peak – between 4:00 pm and 5:00 pm.

Construction traffic generated by the project outside of these periods would be minor, with an increase of around 30 two-way heavy vehicle movements per hour on the surrounding road network.

A summary of the SIDRA intersection modelling results for the “without construction traffic” scenario and the “with construction traffic” scenario is provided in Table 6.5 and Table 6.6. The intersection modelling indicates that the construction traffic would have minor impacts to the operation of these intersections, which would continue to operate with a satisfactory Level of Service (LoS) under the peak construction traffic scenario for the project. Outputs from the SIDRA intersection modelling are provided in full in Appendix B.

Table 6.5 SIDRA modelling results – 2021 surveyed traffic volumes (without construction traffic)

Intersection	AM Peak (7:45 am – 8:45 am)				PM Peak (4:00 pm – 5:00 pm)			
	Average Delay (s)	LoS	Control Type	Degree of Saturation	Average Delay (s)	LoS	Control Type	Degree of Saturation
Cringila Car Park Road / Five Islands Road	9.8	A	Stop	0.016	13.0	A	Stop	0.075
Loop Road / Cringila Car Park Road	5.2	A	Give way/Yield	0.029	5.6	A	Give way/Yield	0.005
Five Islands Road / Emily Road (Entry)	5.9	A	Give way/Yield	0.330	5.6	A	Give way/Yield	0.270
Five Islands Road / Emily Road (Exit)	6.7	A	Give way/Yield	0.028	6.1	A	Give way/Yield	0.087
Springhill Road / BlueScope Access Road	23.8	B	Signal	0.797	22.3	B	Signal	0.591
Five Islands Road / Flagstaff Road intersection	10.7	A	Give way/Yield	0.020	7.8	A	Give way/Yield	0.022

**Note - LoS = Level of Service*

Table 6.6 SIDRA modelling results – During construction (with construction traffic)

Intersection	AM Peak (7:45 am – 8:45 am)				PM Peak (4:00 pm – 5:00 pm)			
	Average Delay (s)	LoS	Control Type	Degree of Saturation	Average Delay (s)	LoS	Control Type	Degree of Saturation
Cringila Car Park Road / Five Islands Road	8.9	A	Stop	0.013	12.6	A	Stop	0.069
Loop Road / Cringila Car Park Road	6.3	A	Give way/Yield	0.072	7.8	A	Give way/Yield	0.014
Five Islands Road / Emily Road (Entry)	5.9	A	Give way/Yield	0.330	5.6	A	Give way/Yield	0.270
Five Islands Road / Emily Road (Exit)	6.7	A	Give way/Yield	0.028	6.7	A	Give way/Yield	0.307
Springhill Road / BlueScope Access Road	23.9	B	Signal	0.797	22.3	B	Signal	0.591
Five Islands Road / Flagstaff Road intersection	10.1	A	Give way/Yield	0.019	7.8	A	Give way/Yield	0.228

**Note - LoS = Level of Service*

6.1.3 Heavy vehicle approved routes

PKSW can be accessed by the following heavy vehicle routes approved for use by vehicles up to 26m B-double equivalent:

– Springhill Road.
– Five Islands Road.
– Flinders Street.
– Old Port Road.
– Masters Road (via Springhill Road).
– Princes Motorway (via Five Islands Road or Masters Road).

It is likely that certain specialist plant, equipment or materials may require the use of oversize or overmass (OSOM) vehicles. Where required OSOM permits would be obtained from TfNSW and licenced haulage contractors engaged to manage OSOM movements.

6.1.4 Car parking

Onsite parking at the central car park, with approximately 570 parking spaces, will be available for the expected project workforce. Personnel are expected to park at the central car park, accessed via Loop Road and will be bused to and from the construction site. In addition, the PKSW also has a range of other locations for formal and informal overflow parking should the need arise. Where possible, contractors would be encouraged to shuttle teams from their offsite premises to the PKSW, for example through the use of minibuses. This would reduce the number of onsite light vehicle parking spaces required. No on-street car parking is proposed to be utilised as part of the project so there would be no impacts to offsite on street parking availability to the public.

6.1.5 Public transport

The proposed construction arrangements would not impact train or bus services operating in the vicinity of the construction sites. The additional traffic generated by the construction activities is also expected to have minimal impacts to public transport services.

6.1.6 Transport infrastructure

New transport infrastructure proposed as part of the project is limited to upgrading pavement around the slag handling area. Traffic in this area is limited to internal traffic only and is not open to the public. Pavement types proposed including details of relevant Australian Standards and TfNSW standards used as a basis for design are outlined in Appendix C. No other upgrades to any transport related infrastructure are proposed as part of the project.

6.1.7 Active transport - Pedestrians and bicycle riders

The proposed construction arrangements are not expected to impact pedestrian or bicycle facilities. The additional traffic generated by the construction activities is expected to have minimal impacts to pedestrians and bicycle riders.

6.1.8 Safe Intersection Sight Distance (SISD) analysis

Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections identifies a minimum safe intersection sight distance of 170 metres is required for the construction traffic connection to Five Islands Road via Emily Road which has a posted speed of 80 km/h as presented in Table 6.7.

Table 6.7 Safe intersection sight distance (SISD) and corresponding minimum crest vertical curve size for sealed roads (S<L)

Route ID	Based on approach sight distance for cars[3] h_1 = 1.1, h_2 = 0, d = 0.36[4]; Observation time = 3 sec					
	R_T = 1.5 sec[5]		R_T = 2.0 sec		R_T = 2.5 sec	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	-	-
50	90	8.6	97	10	-	-
60	114	14	123	16	-	-
70	141	22	151	25	-	-
80	**170**	31	181	35	-	-
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	-	-	285	87	300	97
120	-	-	324	112	341	124
130	-	-	365	143	383	157

Source: Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections
Notes:
K is the length of vertical curve for a 1% change in grade.
To determine SISD for trucks around horizontal curves, use Equation 2 with an observation time of 2.5 sec.
Main Roads Western Australia have adopted a desirable minimum reaction time of 2.5 sec and an absolute minimum reaction time of 2.0 sec.
A reaction time of 1.5 sec is not to be used in Western Australia.
Combinations of design speed and reaction times not shown in this table are generally not used.

Based on the crash data review in Section 4.4, a rear-end collision within the vicinity of the intersection has been reported resulting to a minor injury which can be attributed to the reduced sight distance.

[3] If the average grade over the braking length is not zero, calculate the approach sight distance (ASD) values using the correction factors in Table 3.4 (or use Equation 1) by applying the average grade over the braking length.
[4] A coefficient of deceleration of greater than 0.36 is not provided in this table. The provision of SISD requires more conservative values than for other sight distance models (e.g. the stopping sight distance model allows values up to 0.46 in constrained situations). This is because there is a much higher likelihood of colliding with hazards at intersections (that is, other vehicles). Comparatively, there is a relatively low risk of hitting a small object on the road (the stopping sight distance model).
[5] A 1.5 sec reaction time is only to be used in constrained situations where drivers will be alert. Typical situations are given in Table 5.2 of AGRD Part 3. The general minimum reaction time is 2 sec.

Figure 6.1 Approach Sight Distance from Five Islands Road

Source: Google Maps

As shown in Figure 6.1, the approach sight distance to the Emily Road access / Five Islands Road intersection is considered acceptable, based on the distance measured through Google Maps. Figure 6.2 shows that the view could potentially be obstructed by an existing tree and the existing grade.

In order to verify the site distance, a site visit was undertaken in September 2021 to observe this potential site restriction and assess if the required SISD is achieved. This confirmed that a minimum of 170 metres SISD is achieved at the Emily Road access / Five Islands Road intersection, as shown at Figure 6.1, which meets the Austroads requirements.

Figure 6.2 Emily Road viewed form Five Islands Road

Source: Google Street View

Figure 6.3 Emily Road viewed form Five Islands Road (site visit)

Source: GHD weekday PM peak site inspection, September 2021

6.1.9 Rail

Construction activities will have no impact on the ongoing operation of freight or passenger rail networks.

6.2 Operational impacts

6.2.1 Traffic impacts

Regular operations of the site will resume after the construction period. Therefore, the operational peak hour traffic is expected to be lower than the peak hour traffic associated with the construction activities. The operation of the project traffic is therefore expected to have minimal traffic impacts in regard to intersection performance or mid-block capacity to the surrounding road network.

6.2.2 Car parking

Once 6BF is operational, personnel are expected to park at designated car parks within PKSW in a similar manner as they currently do for the operation of 5BF. As such, there is expected to be minimal impacts to on-street car parking in the study area.

6.2.3 Public transport

The operation of the project would not impact train or bus services operating in the vicinity of the construction sites. The additional traffic generated by the operation of the project is expected to have minimal impacts to public transport services.

6.2.4 Pedestrians and bicycle riders

The operation of the project would not impact pedestrian or bicycle facilities. The traffic movements associated with the project are expected to have minimal impacts to pedestrians and bicycle riders.

7. Recommendations

7.1 Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will need to be prepared prior to the commencement of works to maintain the safety of all workers and road users within the vicinity of the site. The primary objectives of the CTMP would be:

– To minimise the impact of construction vehicle traffic on the overall operation of the road network.
– To provide continuous, safe, and efficient movement of traffic for both the general public and construction workers.
– Installation of appropriate advance warning signs to inform users of any changed traffic condition or provide directions to contractors not familiar with the site.
– To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site.
– To provide information regarding the changed access arrangement and a description of the proposed external routes for vehicles, including the construction vehicles, accessing the site.
– Establishment of a safe pedestrian environment in the vicinity of the site.

All staff and subcontractors engaged on site should be required to undergo site induction. The induction will outline the requirements of the CTMP, including site access routes, environmental and occupational health and safety responsibilities, emergency procedures, potential carpooling opportunities and vehicle height restriction under the power lines, among others. Additionally, the Site Manager will discuss CTMP requirements regularly as a part of “toolbox talks”.

7.2 Traffic management measures

The following are the recommended measures that should be in place prior to the commencement of and during the execution of the construction period:

– Key stakeholders, including owners/operators of adjacent lands and emergency service providers, should be notified of any changes to the traffic management arrangements prior to the commencement of works.
– Truck drivers should be directed to follow the predetermined haulage routes as described in Section 5.5.
– The construction site access layout will be reviewed during design development to consider the turn path required for the construction vehicles.
– No parking of light or heavy vehicles on the public road network.
– Any workers required to undertake works or traffic control shall be suitably trained and hold the required accreditation to carry out works on site and will also be site inducted.
– Provide protection to workers and road users through advanced warning of construction works, speed changes, safety barriers with adequate offsets and deflection allowance, where necessary.
– Site access should be restricted to authorised personnel only and existing employees on site. Pedestrian access to and around the site is to be maintained at all times.
– Roadwork speed zones must be logical, credible, and enforceable. They should only be used where they are self-enforcing or will be enforced. They should be used with other traffic control signs and devices and should not be used in place of more effective traffic controls. They should also be used only while road works are in progress or the lower speed road conditions exist.
– A Transport Access Guide (TAG) should be prepared to identify alternate travel options for visitors and staff to encourage sustainable transport and reduce parking demand. The TAG summarises alternate transport options to access the development, outlining where and how these services can be accessed and the frequency of the service. This could include but is not limited to:
    - Public transport locations (bus and train connection).
    - Active transport (cycle / walking) opportunities.

- Bicycle infrastructure facilities.
- Carpooling between workers (subject to COVID-19 safe practices).

– The following environmental requirements should be adhered to:
  - All vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or debris depositing onto the roadway during travel to and from the site, including but not limited to construction rumble strips/wheels wash at the site egress location.
  - The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles, to maintain the safety of all road users.
  - Vehicles operating to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration.
  - Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

8. Conclusion

8.1 Overview

The purpose of this TIA is to document the results of the assessment of potential traffic impacts during the construction and operation of the project and includes the following scope:

– Review of the existing road and transport conditions, traffic volumes and crash data.
– Review of the construction works of the project and its access arrangements.
– Assessment of the potential impacts of the proposed construction works and the performance of the intersections during construction.
– Determine suitable mitigation measures to minimise impacts.

8.2 Key findings

The key findings of this TIA are summarised as:

– Analysis of the traffic survey conducted by Matrix Traffic and Transport Data Pty Ltd to Tuesday, 7 September 2021 identified the weekday morning traffic peak hour occurs between 7:45 am to 8:45 am and weekday afternoon traffic hour occurs between 4:00 pm to 6:00 pm.
– The construction of the project is expected to generate approximately 600 light vehicle movements, 100 bus movements, and 200 truck movements per day over a three-year period.
– The construction site for the project will be accessed primarily via Cringila Car Park Road in the northwest and via Flagstaff Road in the southeast.
– Train and bus services are available in proximity to the project site and workers should be encouraged to use such alternate transport options in addition to carpooling (subject to COVID-19 safe practices).
– Active transport facilities in proximity to the project site are limited to footpaths/shared paths along Springhill Road, Five Islands Road, Cringila Car Park Road, Old Port Road and BlueScope Access Road.
– A review of five-years of crash statistics identified that the predominant crash types are rear-end collisions and collisions with parked vehicles at daytime and off-carriageway left on right bend into objects and parked vehicles at night. These could be attributed to the reduced sight distance around bends (when compared to straight alignment) or poor driver behaviour such as speeding and tailgating.
– The current traffic data indicates that the majority of key roads in the vicinity of the project are expected to operate within the acceptable capacity for weekday morning and afternoon peak periods.
– The SIDRA 8 intersection modelling indicates that the construction traffic would have minor impacts on the operation of the intersections within the study area. These intersections would continue to operate with a satisfactory LoS under the peak construction traffic scenario for the project.
– Regular operations will resume after construction. Hence, the operational peak hour traffic is lower than the peak hour traffic associated with the construction activities. The operations are therefore expected to have minimal traffic impacts on the surrounding road network.
– The construction and operation of the project will not impact on-street parking and public and active transport movements.

8.3 Final conclusion

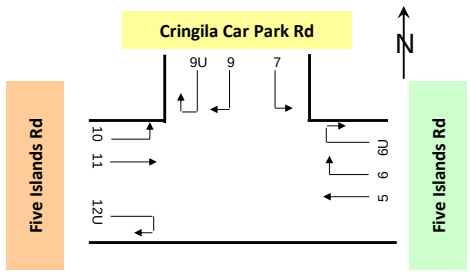
Based on the assumptions and investigations undertaken by GHD and the conclusions drawn in this TIA, it is considered that the proposed project will not have an adverse impact on the road system, subject to the recommended mitigation measures being applied.

Appendix A

Traffic Survey Data

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 1. Five Islands Rd / Cringila Car Park Rd
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



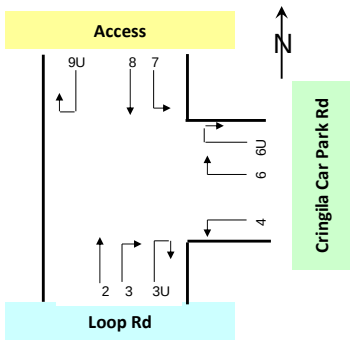
MATRIX Traffic and Transport Data

Approach	Five Islands Rd								
Direction	Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15			0			0			0
5:15 to 5:30			0			0			0
5:30 to 5:45			0			0			0
5:45 to 6:00			0			0			0
6:00 to 6:15			0			0			0
6:15 to 6:30			0			0			0
6:30 to 6:45			0			0			0
6:45 to 7:00			0			0			0
7:00 to 7:15			0			0			0
7:15 to 7:30			0			0			0
7:30 to 7:45			0			0			0
7:45 to 8:00			0			0			0
8:00 to 8:15			0			0			0
8:15 to 8:30			0			0			0
8:30 to 8:45			0			0			0
8:45 to 9:00			0			0			0
AM Totals	0	0	0	0	0	0	0	0	0
16:00 to 16:15			0			0			0
16:15 to 16:30			0			0			0
16:30 to 16:45			0			0			0
16:45 to 17:00			0			0			0
17:00 to 17:15			0			0			0
17:15 to 17:30			0			0			0
17:30 to 17:45			0			0			0
17:45 to 18:00			0			0			0
PM Totals	0	0	0	0	0	0	0	0	0

Approach	Cringila Car Park Rd									Five Islands Rd								
Direction	Direction 7 (Left Turn)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15	4	0	4			0	0	0	0	8	0	8	41	9	50			0
5:15 to 5:30	3	0	3			0	0	0	0	23	0	23	76	6	82			0
5:30 to 5:45	6	0	6			0	0	0	0	44	2	46	103	6	109			0
5:45 to 6:00	2	0	2			0	0	0	0	44	0	44	127	8	135			0
6:00 to 6:15	6	0	6			0	0	0	0	30	1	31	116	9	125			0
6:15 to 6:30	5	1	6			0	0	0	0	32	2	34	153	11	164			0
6:30 to 6:45	2	0	2			0	0	0	0	43	2	45	286	24	310			0
6:45 to 7:00	3	0	3			0	0	0	0	33	0	33	280	20	300			0
7:00 to 7:15	4	0	4			0	0	0	0	26	3	29	183	29	212			0
7:15 to 7:30	1	0	1			0	0	0	0	19	1	20	187	29	216			0
7:30 to 7:45	1	0	1			0	0	0	0	20	2	22	222	30	252			0
7:45 to 8:00	0	0	0			0	0	0	0	11	1	12	250	22	272			0
8:00 to 8:15	1	0	1			0	0	0	0	11	2	13	219	30	249			0
8:15 to 8:30	5	1	6			0	0	0	0	7	2	9	252	27	279			0
8:30 to 8:45	6	0	6			0	0	0	0	5	0	5	248	27	275			0
8:45 to 9:00	1	1	2			0	0	0	0	7	1	8	246	32	278			0
AM Totals	50	3	53	0	0	0	0	0	0	363	19	382	2,989	319	3,308	0	0	0
16:00 to 16:15	8	0	8			0	0	0	0	5	4	9	366	13	379			0
16:15 to 16:30	4	0	4			0	0	0	0	4	1	5	341	16	357			0
16:30 to 16:45	6	0	6			0	0	0	0	4	0	4	337	13	350			0
16:45 to 17:00	9	5	14			0	0	0	0	8	0	8	315	9	324			0
17:00 to 17:15	12	0	12			0	0	0	0	7	0	7	280	15	295			0
17:15 to 17:30	7	1	8			0	0	0	0	12	0	12	303	7	310			0
17:30 to 17:45	8	2	10			0	0	0	0	12	0	12	222	11	233			0
17:45 to 18:00	5	1	6			0	0	0	0	15	0	15	191	15	206			0
PM Totals	59	9	68	0	0	0	0	0	0	67	5	72	2,355	99	2,454	0	0	0

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 2. Loop Rd / Cringila Car Park Rd
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



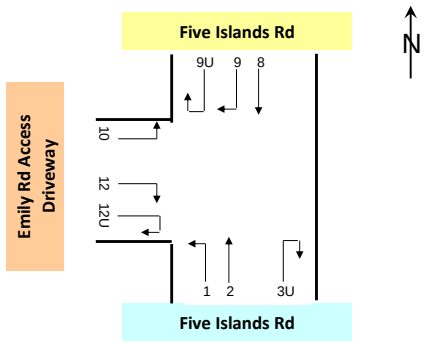
MATRIX Traffic and Transport Data

Approach	Loop Rd									Cringila Car Park Rd								
Direction	Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)				Direction 6 (Right Turn)			Direction 6U (U Turn)	
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15	12	1	**13**	0	0	**0**	0	0	**0**	3	0	**3**		6	0	**6**	0	0	**0**
5:15 to 5:30	14	0	**14**	2	0	**2**	0	0	**0**	3	0	**3**		21	0	**21**	0	0	**0**
5:30 to 5:45	30	2	**32**	6	0	**6**	0	0	**0**	8	0	**8**		32	2	**34**	0	0	**0**
5:45 to 6:00	22	0	**22**	6	0	**6**	0	0	**0**	6	0	**6**		29	0	**29**	2	0	**2**
6:00 to 6:15	25	3	**28**	1	1	**2**	0	0	**0**	4	0	**4**		27	2	**29**	0	0	**0**
6:15 to 6:30	36	4	**40**	0	0	**0**	0	0	**0**	7	1	**8**		30	1	**31**	0	0	**0**
6:30 to 6:45	34	1	**35**	6	0	**6**	0	0	**0**	7	0	**7**		36	1	**37**	0	0	**0**
6:45 to 7:00	34	10	**44**	1	0	**1**	0	0	**0**	9	0	**9**		26	1	**27**	0	0	**0**
7:00 to 7:15	31	7	**38**	1	0	**1**	0	0	**0**	6	0	**6**		20	2	**22**	0	0	**0**
7:15 to 7:30	37	15	**52**	1	0	**1**	0	0	**0**	4	0	**4**		15	2	**17**	0	0	**0**
7:30 to 7:45	13	4	**17**	2	0	**2**	0	0	**0**	5	0	**5**		14	2	**16**	0	0	**0**
7:45 to 8:00	13	2	**15**	1	0	**1**	0	0	**0**	4	0	**4**		8	1	**9**	0	0	**0**
8:00 to 8:15	5	2	**7**	0	1	**1**	0	0	**0**	1	2	**3**		13	1	**14**	0	0	**0**
8:15 to 8:30	4	2	**6**	0	0	**0**	0	0	**0**	2	2	**4**		5	0	**5**	0	0	**0**
8:30 to 8:45	7	2	**9**	1	0	**1**	0	0	**0**	1	0	**1**		3	0	**3**	0	0	**0**
8:45 to 9:00	11	5	**16**	1	0	**1**	0	0	**0**	0	0	**0**		6	1	**7**	0	0	**0**
AM Totals	**328**	**60**	**388**	**29**	**2**	**31**	**0**	**0**	**0**	**70**	**5**	**75**		**291**	**16**	**307**	**2**	**0**	**2**
16:00 to 16:15	9	3	**12**	0	0	**0**	0	0	**0**	2	3	**5**		3	1	**4**	0	0	**0**
16:15 to 16:30	7	0	**7**	0	0	**0**	0	0	**0**	0	1	**1**		4	0	**4**	0	0	**0**
16:30 to 16:45	7	0	**7**	0	0	**0**	0	0	**0**	1	0	**1**		3	0	**3**	0	0	**0**
16:45 to 17:00	3	0	**3**	1	1	**2**	0	0	**0**	4	0	**4**		7	0	**7**	0	0	**0**
17:00 to 17:15	5	4	**9**	0	0	**0**	0	0	**0**	5	0	**5**		5	1	**6**	0	0	**0**
17:15 to 17:30	8	2	**10**	1	1	**2**	0	0	**0**	2	0	**2**		11	0	**11**	0	0	**0**
17:30 to 17:45	7	1	**8**	2	0	**2**	0	0	**0**	2	0	**2**		11	0	**11**	0	0	**0**
17:45 to 18:00	9	0	**9**	1	0	**1**	0	0	**0**	3	0	**3**		7	0	**7**	0	0	**0**
PM Totals	**55**	**10**	**65**	**5**	**2**	**7**	**0**	**0**	**0**	**19**	**4**	**23**		**51**	**2**	**53**	**0**	**0**	**0**

Approach	Access								
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15	3	0	**3**	12	0	**12**	0	0	**0**
5:15 to 5:30	2	0	**2**	8	0	**8**	0	0	**0**
5:30 to 5:45	4	0	**4**	3	0	**3**	0	0	**0**
5:45 to 6:00	1	0	**1**	9	0	**9**	0	0	**0**
6:00 to 6:15	3	0	**3**	7	0	**7**	0	0	**0**
6:15 to 6:30	2	1	**3**	6	2	**8**	0	0	**0**
6:30 to 6:45	1	0	**1**	6	2	**8**	0	0	**0**
6:45 to 7:00	5	0	**5**	7	1	**8**	0	0	**0**
7:00 to 7:15	3	0	**3**	2	1	**3**	0	0	**0**
7:15 to 7:30	0	0	**0**	3	2	**5**	0	0	**0**
7:30 to 7:45	2	0	**2**	4	0	**4**	0	0	**0**
7:45 to 8:00	1	0	**1**	1	0	**1**	0	0	**0**
8:00 to 8:15	2	0	**2**	5	3	**8**	0	0	**0**
8:15 to 8:30	5	1	**6**	12	2	**14**	0	0	**0**
8:30 to 8:45	3	0	**3**	7	2	**9**	0	0	**0**
8:45 to 9:00	1	1	**2**	10	4	**14**	0	0	**0**
AM Totals	**38**	**3**	**41**	**102**	**19**	**121**	**0**	**0**	**0**
16:00 to 16:15	9	0	**9**	29	4	**33**	0	0	**0**
16:15 to 16:30	4	0	**4**	8	0	**8**	0	0	**0**
16:30 to 16:45	6	1	**7**	9	3	**12**	0	0	**0**
16:45 to 17:00	9	3	**12**	22	4	**26**	0	0	**0**
17:00 to 17:15	9	0	**9**	24	0	**24**	0	0	**0**
17:15 to 17:30	5	0	**5**	15	1	**16**	0	0	**0**
17:30 to 17:45	7	3	**10**	14	2	**16**	0	0	**0**
17:45 to 18:00	5	0	**5**	23	2	**25**	0	0	**0**
PM Totals	**54**	**7**	**61**	**144**	**16**	**160**	**0**	**0**	**0**

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 3. Five Islands Rd / Emily Rd Access Driveway
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



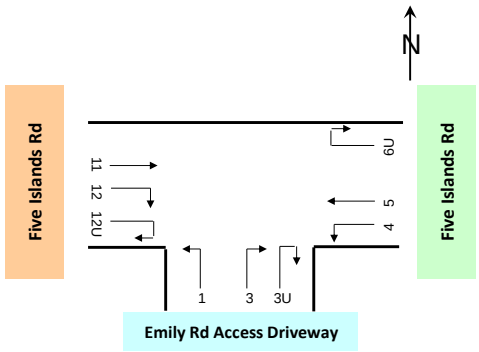
MATRIX Traffic and Transport Data

Approach	Five Islands Rd											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)						Direction 3U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total				Lights	Heavies	Total
5:00 to 5:15	9	0	**9**	104	13	**117**						**0**
5:15 to 5:30	11	0	**11**	137	15	**152**						**0**
5:30 to 5:45	26	0	**26**	180	16	**196**						**0**
5:45 to 6:00	17	0	**17**	159	21	**180**						**0**
6:00 to 6:15	18	2	**20**	181	14	**195**						**0**
6:15 to 6:30	30	0	**30**	233	13	**246**						**0**
6:30 to 6:45	26	1	**27**	314	23	**337**						**0**
6:45 to 7:00	19	4	**23**	254	26	**280**						**0**
7:00 to 7:15	8	4	**12**	219	26	**245**						**0**
7:15 to 7:30	7	5	**12**	257	25	**282**						**0**
7:30 to 7:45	3	1	**4**	246	23	**269**						**0**
7:45 to 8:00	4	0	**4**	296	32	**328**						**0**
8:00 to 8:15	1	0	**1**	263	21	**284**						**0**
8:15 to 8:30	1	1	**2**	253	19	**272**						**0**
8:30 to 8:45	1	1	**2**	282	28	**310**						**0**
8:45 to 9:00	8	1	**9**	245	35	**280**						**0**
AM Totals	**189**	**20**	**209**	**3,623**	**350**	**3,973**				**0**	**0**	**0**
16:00 to 16:15	9	0	**9**	345	19	**364**						**0**
16:15 to 16:30	1	0	**1**	253	20	**273**						**0**
16:30 to 16:45	4	0	**4**	272	14	**286**						**0**
16:45 to 17:00	2	0	**2**	296	17	**313**						**0**
17:00 to 17:15	1	0	**1**	290	15	**305**						**0**
17:15 to 17:30	7	0	**7**	250	8	**258**						**0**
17:30 to 17:45	6	1	**7**	227	11	**238**						**0**
17:45 to 18:00	5	0	**5**	226	9	**235**						**0**
PM Totals	**35**	**1**	**36**	**2,159**	**113**	**2,272**				**0**	**0**	**0**

Approach	Five Islands Rd									Emily Rd Access Driveway								
Direction	Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
5:15 to 5:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
5:30 to 5:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
5:45 to 6:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
6:00 to 6:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
6:15 to 6:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
6:30 to 6:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
6:45 to 7:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
7:00 to 7:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
7:15 to 7:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
7:30 to 7:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
7:45 to 8:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
8:00 to 8:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
8:15 to 8:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
8:30 to 8:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
8:45 to 9:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
AM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 to 16:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
16:15 to 16:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
16:30 to 16:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
16:45 to 17:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
17:00 to 17:15			**0**			**0**			**0**	0	0	**0**			**0**			**0**
17:15 to 17:30			**0**			**0**			**0**	0	0	**0**			**0**			**0**
17:30 to 17:45			**0**			**0**			**0**	0	0	**0**			**0**			**0**
17:45 to 18:00			**0**			**0**			**0**	0	0	**0**			**0**			**0**
PM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 4. Five Islands Rd / Emily Rd Access Driveway
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies

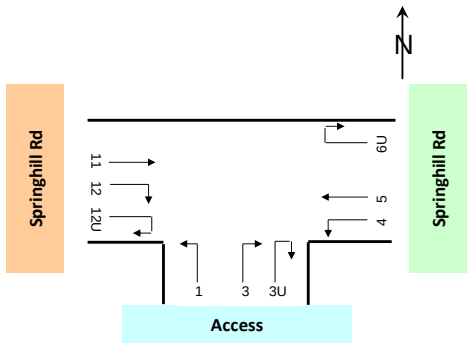


Approach	Emily Rd Access Driveway									Five Islands Rd								
Direction	Direction 1 (Left Turn)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15	12	0	**12**			**0**	0	0	**0**			**0**	103	13	**116**			**0**
5:15 to 5:30	7	0	**7**			**0**	0	0	**0**			**0**	136	14	**150**			**0**
5:30 to 5:45	4	1	**5**			**0**	0	0	**0**			**0**	178	18	**196**			**0**
5:45 to 6:00	12	0	**12**			**0**	0	0	**0**			**0**	168	20	**188**			**0**
6:00 to 6:15	5	0	**5**			**0**	0	0	**0**			**0**	170	13	**183**			**0**
6:15 to 6:30	8	1	**9**			**0**	0	0	**0**			**0**	232	15	**247**			**0**
6:30 to 6:45	7	0	**7**			**0**	0	0	**0**			**0**	312	22	**334**			**0**
6:45 to 7:00	11	0	**11**			**0**	0	0	**0**			**0**	261	21	**282**			**0**
7:00 to 7:15	3	0	**3**			**0**	0	0	**0**			**0**	204	29	**233**			**0**
7:15 to 7:30	7	2	**9**			**0**	0	0	**0**			**0**	260	26	**286**			**0**
7:30 to 7:45	6	1	**7**			**0**	0	0	**0**			**0**	269	24	**293**			**0**
7:45 to 8:00	6	0	**6**			**0**	0	0	**0**			**0**	274	31	**305**			**0**
8:00 to 8:15	5	0	**5**			**0**	0	0	**0**			**0**	268	18	**286**			**0**
8:15 to 8:30	5	2	**7**			**0**	0	0	**0**			**0**	260	22	**282**			**0**
8:30 to 8:45	5	0	**5**			**0**	0	0	**0**			**0**	280	28	**308**			**0**
8:45 to 9:00	7	1	**8**			**0**	0	0	**0**			**0**	249	34	**283**			**0**
AM Totals	**110**	**8**	**118**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,624**	**348**	**3,972**	**0**	**0**	**0**
16:00 to 16:15	29	6	**35**			**0**	0	0	**0**			**0**	322	18	**340**			**0**
16:15 to 16:30	10	0	**10**			**0**	0	0	**0**			**0**	263	21	**284**			**0**
16:30 to 16:45	9	2	**11**			**0**	0	0	**0**			**0**	292	13	**305**			**0**
16:45 to 17:00	23	1	**24**			**0**	0	0	**0**			**0**	281	18	**299**			**0**
17:00 to 17:15	24	0	**24**			**0**	0	0	**0**			**0**	281	14	**295**			**0**
17:15 to 17:30	16	1	**17**			**0**	0	0	**0**			**0**	271	7	**278**			**0**
17:30 to 17:45	13	1	**14**			**0**	0	0	**0**			**0**	212	11	**223**			**0**
17:45 to 18:00	24	2	**26**			**0**	0	0	**0**			**0**	242	10	**252**			**0**
PM Totals	**148**	**13**	**161**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,164**	**112**	**2,276**	**0**	**0**	**0**

Approach	Five Islands Rd								
Direction	Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15			**0**			**0**			**0**
5:15 to 5:30			**0**			**0**			**0**
5:30 to 5:45			**0**			**0**			**0**
5:45 to 6:00			**0**			**0**			**0**
6:00 to 6:15			**0**			**0**			**0**
6:15 to 6:30			**0**			**0**			**0**
6:30 to 6:45			**0**			**0**			**0**
6:45 to 7:00			**0**			**0**			**0**
7:00 to 7:15			**0**			**0**			**0**
7:15 to 7:30			**0**			**0**			**0**
7:30 to 7:45			**0**			**0**			**0**
7:45 to 8:00			**0**			**0**			**0**
8:00 to 8:15			**0**			**0**			**0**
8:15 to 8:30			**0**			**0**			**0**
8:30 to 8:45			**0**			**0**			**0**
8:45 to 9:00			**0**			**0**			**0**
AM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 to 16:15			**0**			**0**			**0**
16:15 to 16:30			**0**			**0**			**0**
16:30 to 16:45			**0**			**0**			**0**
16:45 to 17:00			**0**			**0**			**0**
17:00 to 17:15			**0**			**0**			**0**
17:15 to 17:30			**0**			**0**			**0**
17:30 to 17:45			**0**			**0**			**0**
17:45 to 18:00			**0**			**0**			**0**
PM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 5. Springhill Rd / Bluescope Access
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



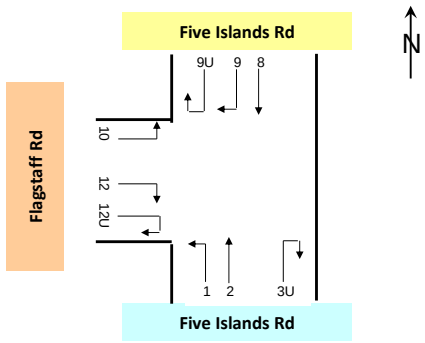
MATRIX Traffic and Transport Data

Approach	**Access**									**Springhill Rd**								
Direction	**Direction 1 (Left Turn)**				**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**		**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
5:00 to 5:15	4	2	**6**		0	0	**0**	0	0	**0**	2	0	**2**	24	6	**30**	0	0	**0**
5:15 to 5:30	3	1	**4**		1	0	**1**	0	0	**0**	5	0	**5**	31	14	**45**	0	0	**0**
5:30 to 5:45	7	1	**8**		1	0	**1**	0	0	**0**	3	0	**3**	49	14	**63**	0	0	**0**
5:45 to 6:00	11	4	**15**		3	0	**3**	0	0	**0**	2	0	**2**	54	21	**75**	0	0	**0**
6:00 to 6:15	5	1	**6**		0	0	**0**	0	0	**0**	5	0	**5**	56	15	**71**	0	0	**0**
6:15 to 6:30	9	1	**10**		0	0	**0**	0	0	**0**	5	0	**5**	83	19	**102**	0	0	**0**
6:30 to 6:45	13	3	**16**		1	1	**2**	0	0	**0**	15	1	**16**	141	11	**152**	0	0	**0**
6:45 to 7:00	30	0	**30**		4	0	**4**	0	0	**0**	15	1	**16**	123	20	**143**	0	0	**0**
7:00 to 7:15	31	2	**33**		6	0	**6**	0	0	**0**	9	0	**9**	112	17	**129**	0	0	**0**
7:15 to 7:30	7	2	**9**		1	2	**3**	0	0	**0**	9	4	**13**	133	29	**162**	0	0	**0**
7:30 to 7:45	4	4	**8**		1	0	**1**	0	0	**0**	8	2	**10**	175	29	**204**	0	0	**0**
7:45 to 8:00	1	5	**6**		2	0	**2**	0	0	**0**	6	2	**8**	145	26	**171**	0	0	**0**
8:00 to 8:15	2	2	**4**		1	0	**1**	0	0	**0**	1	0	**1**	141	15	**156**	0	0	**0**
8:15 to 8:30	0	4	**4**		3	0	**3**	0	0	**0**	6	0	**6**	152	25	**177**	0	0	**0**
8:30 to 8:45	2	2	**4**		3	0	**3**	0	0	**0**	4	0	**4**	184	22	**206**	0	0	**0**
8:45 to 9:00	2	2	**4**		2	0	**2**	0	0	**0**	3	0	**3**	173	27	**200**	0	0	**0**
AM Totals	**131**	**36**	**167**		**29**	**3**	**32**	**0**	**0**	**0**	**98**	**10**	**108**	**1,776**	**310**	**2,086**	**0**	**0**	**0**
16:00 to 16:15	17	1	**18**		6	0	**6**	0	0	**0**	1	0	**1**	319	16	**335**	0	0	**0**
16:15 to 16:30	12	2	**14**		6	0	**6**	0	0	**0**	0	0	**0**	298	9	**307**	0	0	**0**
16:30 to 16:45	13	5	**18**		4	0	**4**	0	0	**0**	2	0	**2**	326	6	**332**	0	0	**0**
16:45 to 17:00	8	3	**11**		8	1	**9**	0	0	**0**	2	1	**3**	320	8	**328**	0	0	**0**
17:00 to 17:15	6	3	**9**		4	0	**4**	0	0	**0**	3	0	**3**	455	7	**462**	0	0	**0**
17:15 to 17:30	10	2	**12**		2	0	**2**	0	0	**0**	6	0	**6**	321	6	**327**	0	0	**0**
17:30 to 17:45	14	2	**16**		4	0	**4**	0	0	**0**	3	0	**3**	252	12	**264**	0	0	**0**
17:45 to 18:00	8	0	**8**		0	0	**0**	0	0	**0**	2	0	**2**	238	7	**245**	0	0	**0**
PM Totals	**88**	**18**	**106**		**34**	**1**	**35**	**0**	**0**	**0**	**19**	**1**	**20**	**2,529**	**71**	**2,600**	**0**	**0**	**0**

Approach	**Springhill Rd**								
Direction	**Direction 11 (Through)**			**Direction 12 (Right Turn)**			**Direction 12U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
5:00 to 5:15	29	10	**39**	13	2	**15**	0	0	**0**
5:15 to 5:30	47	25	**72**	20	3	**23**	0	0	**0**
5:30 to 5:45	92	19	**111**	14	5	**19**	1	0	**1**
5:45 to 6:00	117	25	**142**	30	0	**30**	0	0	**0**
6:00 to 6:15	111	22	**133**	21	1	**22**	0	0	**0**
6:15 to 6:30	188	11	**199**	51	4	**55**	0	0	**0**
6:30 to 6:45	215	21	**236**	78	4	**82**	0	0	**0**
6:45 to 7:00	263	15	**278**	52	5	**57**	0	0	**0**
7:00 to 7:15	166	18	**184**	33	7	**40**	0	0	**0**
7:15 to 7:30	230	26	**256**	19	2	**21**	0	0	**0**
7:30 to 7:45	292	22	**314**	11	7	**18**	1	0	**1**
7:45 to 8:00	367	22	**389**	8	2	**10**	0	0	**0**
8:00 to 8:15	331	31	**362**	6	4	**10**	0	0	**0**
8:15 to 8:30	391	31	**422**	3	4	**7**	0	0	**0**
8:30 to 8:45	347	26	**373**	5	2	**7**	0	0	**0**
8:45 to 9:00	312	25	**337**	7	2	**9**	0	0	**0**
AM Totals	**3,498**	**349**	**3,847**	**371**	**54**	**425**	**2**	**0**	**2**
16:00 to 16:15	227	14	**241**	1	6	**7**	0	0	**0**
16:15 to 16:30	222	13	**235**	0	0	**0**	0	0	**0**
16:30 to 16:45	202	8	**210**	2	1	**3**	0	0	**0**
16:45 to 17:00	190	5	**195**	2	0	**2**	0	0	**0**
17:00 to 17:15	161	4	**165**	13	1	**14**	0	0	**0**
17:15 to 17:30	178	10	**188**	20	2	**22**	0	0	**0**
17:30 to 17:45	111	7	**118**	15	1	**16**	0	0	**0**
17:45 to 18:00	137	5	**142**	2	0	**2**	0	0	**0**
PM Totals	**1,428**	**66**	**1,494**	**55**	**11**	**66**	**0**	**0**	**0**

Job No.	: AUNSW1595
Client	: GHD Pty Ltd
Suburb	: Port Kembla
Location	: 6. Five Islands Rd / Flagstaff Rd
Day/Date	: Tue, 7th Sept 2021
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



MATRIX Traffic and Transport Data

Approach	Five Islands Rd														
Direction	Direction 1 (Left Turn)			Direction 2 (Through)						Direction 3U (U Turn)					
Time Period	Lights	Heavies	Total	Lights	Heavies	Total				Lights	Heavies	Total			
5:00 to 5:15	4	0	**4**	119	8	**127**						**0**			
5:15 to 5:30	4	0	**4**	157	7	**164**						**0**			
5:30 to 5:45	6	0	**6**	206	10	**216**						**0**			
5:45 to 6:00	9	0	**9**	173	13	**186**						**0**			
6:00 to 6:15	7	0	**7**	196	14	**210**						**0**			
6:15 to 6:30	13	0	**13**	274	7	**281**						**0**			
6:30 to 6:45	15	0	**15**	365	19	**384**						**0**			
6:45 to 7:00	11	0	**11**	281	22	**303**						**0**			
7:00 to 7:15	2	1	**3**	221	23	**244**						**0**			
7:15 to 7:30	1	0	**1**	261	24	**285**						**0**			
7:30 to 7:45	1	1	**2**	252	14	**266**						**0**			
7:45 to 8:00	2	0	**2**	294	23	**317**						**0**			
8:00 to 8:15	2	0	**2**	262	17	**279**						**0**			
8:15 to 8:30	2	0	**2**	236	10	**246**						**0**			
8:30 to 8:45	2	0	**2**	269	15	**284**						**0**			
8:45 to 9:00	2	0	**2**	240	26	**266**						**0**			
AM Totals	**83**	**2**	**85**	**3,806**	**252**	**4,058**				**0**	**0**	**0**			
16:00 to 16:15	1	0	**1**	295	6	**301**						**0**			
16:15 to 16:30	0	0	**0**	225	11	**236**						**0**			
16:30 to 16:45	1	0	**1**	256	10	**266**						**0**			
16:45 to 17:00	3	0	**3**	252	11	**263**						**0**			
17:00 to 17:15	3	0	**3**	260	8	**268**						**0**			
17:15 to 17:30	1	0	**1**	227	2	**229**						**0**			
17:30 to 17:45	0	0	**0**	217	8	**225**						**0**			
17:45 to 18:00	0	0	**0**	195	5	**200**						**0**			
PM Totals	**9**	**0**	**9**	**1,927**	**61**	**1,988**				**0**	**0**	**0**			

Approach	Five Islands Rd									Flagstaff Rd								
Direction	Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
5:00 to 5:15			**0**			**0**			**0**	1	1	**2**			**0**	0	0	**0**
5:15 to 5:30			**0**			**0**			**0**	2	0	**2**			**0**	0	0	**0**
5:30 to 5:45			**0**			**0**			**0**	3	2	**5**			**0**	0	0	**0**
5:45 to 6:00			**0**			**0**			**0**	0	1	**1**			**0**	0	0	**0**
6:00 to 6:15			**0**			**0**			**0**	2	0	**2**			**0**	0	0	**0**
6:15 to 6:30			**0**			**0**			**0**	2	0	**2**			**0**	0	0	**0**
6:30 to 6:45			**0**			**0**			**0**	4	0	**4**			**0**	0	0	**0**
6:45 to 7:00			**0**			**0**			**0**	3	1	**4**			**0**	0	0	**0**
7:00 to 7:15			**0**			**0**			**0**	16	1	**17**			**0**	0	0	**0**
7:15 to 7:30			**0**			**0**			**0**	8	1	**9**			**0**	0	0	**0**
7:30 to 7:45			**0**			**0**			**0**	1	1	**2**			**0**	0	0	**0**
7:45 to 8:00			**0**			**0**			**0**	4	2	**6**			**0**	0	0	**0**
8:00 to 8:15			**0**			**0**			**0**	3	1	**4**			**0**	0	0	**0**
8:15 to 8:30			**0**			**0**			**0**	2	1	**3**			**0**	0	0	**0**
8:30 to 8:45			**0**			**0**			**0**	6	0	**6**			**0**	0	0	**0**
8:45 to 9:00			**0**			**0**			**0**	5	0	**5**			**0**	0	0	**0**
AM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**62**	**12**	**74**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 to 16:15			**0**			**0**			**0**	13	0	**13**			**0**	0	0	**0**
16:15 to 16:30			**0**			**0**			**0**	8	0	**8**			**0**	0	0	**0**
16:30 to 16:45			**0**			**0**			**0**	5	0	**5**			**0**	0	0	**0**
16:45 to 17:00			**0**			**0**			**0**	5	1	**6**			**0**	0	0	**0**
17:00 to 17:15			**0**			**0**			**0**	10	0	**10**			**0**	0	0	**0**
17:15 to 17:30			**0**			**0**			**0**	8	0	**8**			**0**	0	0	**0**
17:30 to 17:45			**0**			**0**			**0**	6	0	**6**			**0**	0	0	**0**
17:45 to 18:00			**0**			**0**			**0**	3	0	**3**			**0**	0	0	**0**
PM Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**58**	**1**	**59**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix B

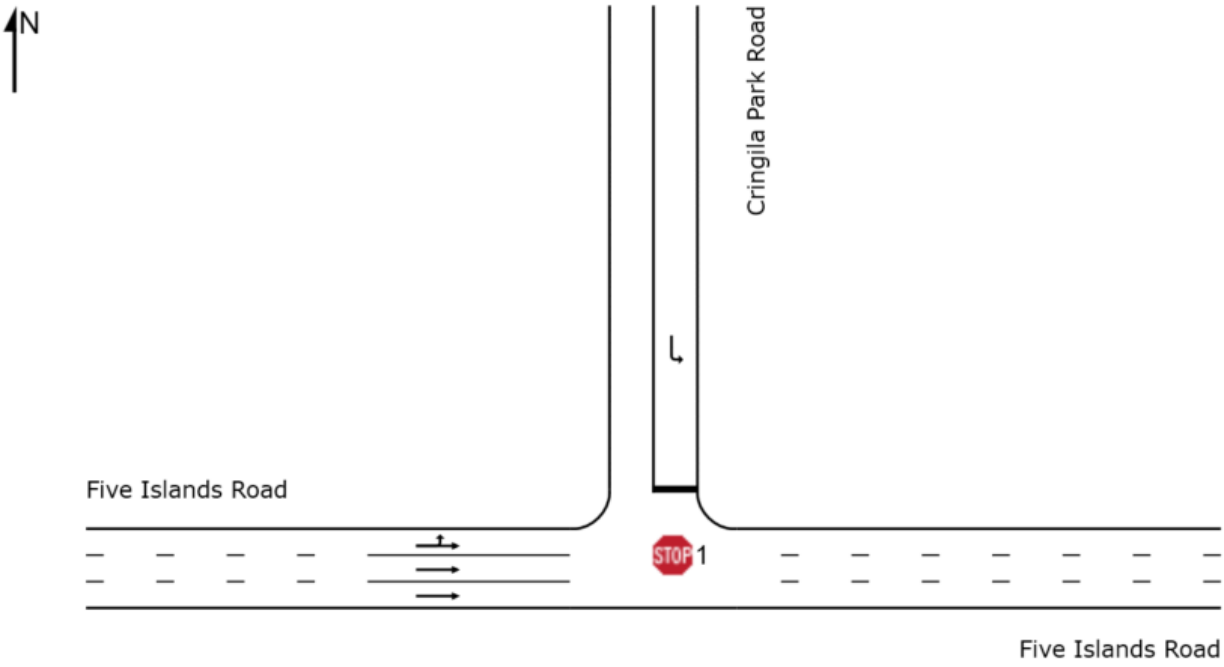
SIDRA Results Summary

Site 1: Cringilla Car Park Road and Five Islands Road

SITE LAYOUT

Site: 1 [2021_AM_Base Case_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)



Site 1: Cringilla Car Park Road and Five Islands Road 2021 AM Peak

MOVEMENT SUMMARY

Site: 1 [2021_AM_Base Case_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
North: Cringila Park Road												
7	L2	14	7.1	0.016	9.8	LOS A	0.1	0.4	0.46	0.86	0.46	51.8
Approach		14	7.1	0.016	9.8	LOS A	0.1	0.4	0.46	0.86	0.46	51.8
West: Five Islands Road												
10	L2	51	13.7	0.259	5.7	LOS A	0.0	0.0	0.00	0.07	0.00	53.4
11	T1	1344	9.9	0.259	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		1395	10.0	0.259	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		1409	10.0	0.259	0.3	NA	0.1	0.4	0.00	0.03	0.00	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [2021_AM_Base Case_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
North: Cringila Park Road													
Lane 1	14	7.1	861	0.016	100	9.8	LOS A	0.1	0.4	Full	250	0.0	0.0
Approach	14	7.1		0.016		9.8	LOS A	0.1	0.4				
West: Five Islands Road													
Lane 1	462	10.3	1787	0.259	100	0.6	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 2	466	9.9	1804	0.259	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 3	466	9.9	1804	0.259	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Approach	1395	10.0		0.259		0.2	NA	0.0	0.0				
Intersection	1409	10.0		0.259		0.3	NA	0.1	0.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 1: Cringilla Car Park Road and Five Islands Road 2021 PM Peak

MOVEMENT SUMMARY

Site: 1 [2021_PM_Base Case_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
North: Cringila Park Road												
7	L2	42	16.7	0.075	13.0	LOS A	0.3	2.2	0.60	0.99	0.60	50.3
Approach		42	16.7	0.075	13.0	LOS A	0.3	2.2	0.60	0.99	0.60	50.3
West: Five Islands Road												
10	L2	5	20.0	0.352	5.8	LOS A	0.0	0.0	0.00	0.00	0.00	52.8
11	T1	1974	3.6	0.352	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1979	3.6	0.352	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		2021	3.9	0.352	0.3	NA	0.3	2.2	0.01	0.02	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [2021_PM_Base Case_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
North: Cringila Park Road													
Lane 1	42	16.7	560	0.075	100	13.0	LOS A	0.3	2.2	Full	250	0.0	0.0
Approach	42	16.7		0.075		13.0	LOS A	0.3	2.2				
West: Five Islands Road													
Lane 1	659	3.7	1873	0.352	100	0.1	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 2	660	3.6	1876	0.352	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 3	660	3.6	1876	0.352	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Approach	1979	3.6		0.352		0.0	NA	0.0	0.0				
Intersection	2021	3.9		0.352		0.3	NA	0.3	2.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 1: Cringilla Car Park Road and Five Islands Road 2024 AM Peak

MOVEMENT SUMMARY

Site: 1 [2024_AM_During Construction_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
North: Cringila Park Road												
7	L2	14	7.1	0.013	8.9	LOS A	0.1	0.4	0.36	0.85	0.36	52.2
Approach		14	7.1	0.013	8.9	LOS A	0.1	0.4	0.36	0.85	0.36	52.2
West: Five Islands Road												
10	L2	262	6.9	0.299	5.6	LOS A	0.0	0.0	0.00	0.29	0.00	51.9
11	T1	1344	9.9	0.299	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.6
Approach		1606	9.4	0.299	0.9	NA	0.0	0.0	0.00	0.10	0.00	59.0
All Vehicles		1620	9.4	0.299	1.0	NA	0.1	0.4	0.00	0.10	0.00	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [2024_AM_During Construction_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
North: Cringila Park Road													
Lane 1	14	7.1	1038	0.013	100	8.9	LOS A	0.1	0.4	Full	250	0.0	0.0
Approach	14	7.1		0.013		8.9	LOS A	0.1	0.4				
West: Five Islands Road													
Lane 1	529	8.4	1773	0.299	100	2.8	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 2	538	9.9	1804	0.299	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 3	538	9.9	1804	0.299	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Approach	1606	9.4		0.299		0.9	NA	0.0	0.0				
Intersection	1620	9.4		0.299		1.0	NA	0.1	0.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 1: Cringilla Car Park Road and Five Islands Road 2024 PM Peak

MOVEMENT SUMMARY

Site: 1 [2024_PM_During Construction_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
North: Cringila Park Road												
7	L2	40	12.5	0.069	12.6	LOS A	0.2	1.9	0.59	0.98	0.59	50.5
Approach		40	12.5	0.069	12.6	LOS A	0.2	1.9	0.59	0.98	0.59	50.5
West: Five Islands Road												
10	L2	5	20.0	0.352	5.8	LOS A	0.0	0.0	0.00	0.00	0.00	52.8
11	T1	1974	3.6	0.352	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1979	3.6	0.352	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		2019	3.8	0.352	0.3	NA	0.2	1.9	0.01	0.02	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [2024_PM_During Construction_Cringila Park Road and Five Islands Road]

Cringila Park Road and Five Islands Road
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
North: Cringila Park Road													
Lane 1	40	12.5	582	0.069	100	12.6	LOS A	0.2	1.9	Full	250	0.0	0.0
Approach	40	12.5		0.069		12.6	LOS A	0.2	1.9				
West: Five Islands Road													
Lane 1	659	3.7	1873	0.352	100	0.1	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 2	660	3.6	1876	0.352	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Lane 3	660	3.6	1876	0.352	100	0.0	LOS A	0.0	0.0	Full	330	0.0	0.0
Approach	1979	3.6		0.352		0.0	NA	0.0	0.0				
Intersection	2019	3.8		0.352		0.3	NA	0.2	1.9				

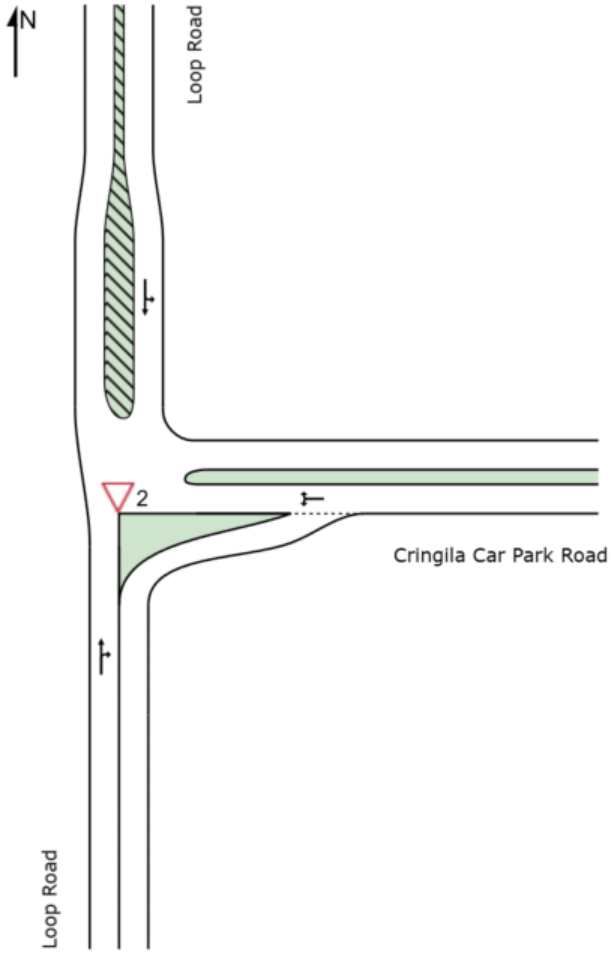
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 2: Loop Road and Cringilla Car Park Road

SITE LAYOUT

Site: 2 [2021_AM_Base Case_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)



Site 2: Loop Road and Cringilla Car Park Road 2021 AM Peak

MOVEMENT SUMMARY

▽ Site: 2 [2021_AM_Base Case_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Loop Road												
2	T1	48	20.8	0.029	0.0	LOS A	0.0	0.2	0.03	0.03	0.03	49.2
3	R2	3	33.3	0.029	5.2	LOS A	0.0	0.2	0.03	0.03	0.03	46.7
Approach		51	21.6	0.029	0.3	NA	0.0	0.2	0.03	0.03	0.03	49.0
East: Cringila Car Park Road												
4	L2	15	33.3	0.048	5.0	LOS A	0.2	1.4	0.17	0.49	0.17	43.8
6	R2	41	7.3	0.048	5.0	LOS A	0.2	1.4	0.17	0.49	0.17	39.9
Approach		56	14.3	0.048	5.0	NA	0.2	1.4	0.17	0.49	0.17	41.1
North: Loop Road												
7	L2	13	7.7	0.025	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	45.9
8	T1	32	21.9	0.025	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	47.0
Approach		45	17.8	0.025	1.3	NA	0.0	0.0	0.00	0.16	0.00	46.6
All Vehicles		152	17.8	0.048	2.4	NA	0.2	1.4	0.07	0.24	0.07	44.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 2 [2021_AM_Base Case_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Loop Road													
Lane 1	51	21.6	1739	0.029	100	0.3	LOS A	0.0	0.2	Full	205	0.0	0.0
Approach	51	21.6		0.029		0.3	NA	0.0	0.2				
East: Cringila Car Park Road													
Lane 1	56	14.3	1156	0.048	100	5.0	LOS A	0.2	1.4	Full	250	0.0	0.0
Approach	56	14.3		0.048		5.0	NA	0.2	1.4				
North: Loop Road													
Lane 1	45	17.8	1785	0.025	100	1.3	LOS A	0.0	0.0	Full	105	0.0	0.0
Approach	45	17.8		0.025		1.3	NA	0.0	0.0				
Intersection	152	17.8		0.048		2.4	NA	0.2	1.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 2: Loop Road and Cringilla Car Park Road 2021 PM Peak

MOVEMENT SUMMARY

▽ Site: 2 [2021_PM_Base Case_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Loop Road												
2	T1	6	16.7	0.005	0.2	LOS A	0.0	0.1	0.15	0.13	0.15	47.2
3	R2	2	50.0	0.005	5.6	LOS A	0.0	0.1	0.15	0.13	0.15	44.9
Approach		8	25.0	0.005	1.6	NA	0.0	0.1	0.15	0.13	0.15	46.4
East: Cringila Car Park Road												
4	L2	2	50.0	0.004	5.0	LOS A	0.0	0.1	0.16	0.46	0.16	43.6
6	R2	3	0.0	0.004	4.9	LOS A	0.0	0.1	0.16	0.46	0.16	40.5
Approach		5	20.0	0.004	5.0	NA	0.0	0.1	0.16	0.46	0.16	41.9
North: Loop Road												
7	L2	41	12.2	0.066	4.7	LOS A	0.0	0.0	0.00	0.18	0.00	45.5
8	T1	79	13.9	0.066	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	46.8
Approach		120	13.3	0.066	1.6	NA	0.0	0.0	0.00	0.18	0.00	46.3
All Vehicles		133	14.3	0.066	1.7	NA	0.0	0.1	0.01	0.19	0.01	46.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 2 [2021_PM_Base Case_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Loop Road													
Lane 1	8	25.0	1560	0.005	100	1.6	LOS A	0.0	0.1	Full	205	0.0	0.0
Approach	8	25.0		0.005		1.6	NA	0.0	0.1				
East: Cringila Car Park Road													
Lane 1	5	20.0	1250	0.004	100	5.0	LOS A	0.0	0.1	Full	250	0.0	0.0
Approach	5	20.0		0.004		5.0	NA	0.0	0.1				
North: Loop Road													
Lane 1	120	13.3	1824	0.066	100	1.6	LOS A	0.0	0.0	Full	105	0.0	0.0
Approach	120	13.3		0.066		1.6	NA	0.0	0.0				
Intersection	133	14.3		0.066		1.7	NA	0.0	0.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 2: Loop Road and Cringilla Car Park Road 2024 AM Peak

MOVEMENT SUMMARY

▽ Site: 2 [2024_AM_During Construction_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Loop Road												
2	T1	133	7.5	0.072	0.1	LOS A	0.0	0.2	0.02	0.01	0.02	49.6
3	R2	3	33.3	0.072	6.3	LOS A	0.0	0.2	0.02	0.01	0.02	46.9
Approach		136	8.1	0.072	0.2	NA	0.0	0.2	0.02	0.01	0.02	49.5
East: Cringila Car Park Road												
4	L2	26	61.5	0.261	5.8	LOS A	1.1	8.0	0.31	0.57	0.31	42.7
6	R2	241	1.2	0.261	5.6	LOS A	1.1	8.0	0.31	0.57	0.31	39.6
Approach		267	7.1	0.261	5.6	NA	1.1	8.0	0.31	0.57	0.31	39.9
North: Loop Road												
7	L2	13	7.7	0.025	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	45.9
8	T1	32	21.9	0.025	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	47.0
Approach		45	17.8	0.025	1.3	NA	0.0	0.0	0.00	0.16	0.00	46.6
All Vehicles		448	8.5	0.261	3.5	NA	1.1	8.0	0.19	0.36	0.19	42.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 2 [2024_AM_During Construction_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Loop Road													
Lane 1	136	8.1	1888	0.072	100	0.2	LOS A	0.0	0.2	Full	205	0.0	0.0
Approach	136	8.1		0.072		0.2	NA	0.0	0.2				
East: Cringila Car Park Road													
Lane 1	267	7.1	1023	0.261	100	5.6	LOS A	1.1	8.0	Full	250	0.0	0.0
Approach	267	7.1		0.261		5.6	NA	1.1	8.0				
North: Loop Road													
Lane 1	45	17.8	1785	0.025	100	1.3	LOS A	0.0	0.0	Full	105	0.0	0.0
Approach	45	17.8		0.025		1.3	NA	0.0	0.0				
Intersection	448	8.5		0.261		3.5	NA	1.1	8.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 2: Loop Road and Cringilla Car Park Road 2024 PM Peak

MOVEMENT SUMMARY

▽ Site: 2 [2024_PM_During Construction_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Loop Road												
2	T1	6	16.7	0.006	1.1	LOS A	0.0	0.2	0.30	0.13	0.30	45.7
3	R2	2	50.0	0.006	7.4	LOS A	0.0	0.2	0.30	0.13	0.30	43.9
Approach		8	25.0	0.006	2.7	NA	0.0	0.2	0.30	0.13	0.30	45.1
East: Cringila Car Park Road												
4	L2	3	33.3	0.014	7.4	LOS A	0.1	0.5	0.43	0.50	0.43	41.6
6	R2	7	42.9	0.014	7.8	LOS A	0.1	0.5	0.43	0.50	0.43	35.6
Approach		10	40.0	0.014	7.7	NA	0.1	0.5	0.43	0.50	0.43	37.5
North: Loop Road												
7	L2	41	12.2	0.207	4.7	LOS A	0.0	0.0	0.00	0.05	0.00	47.4
8	T1	364	3.0	0.207	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
Approach		405	4.0	0.207	0.5	NA	0.0	0.0	0.00	0.05	0.00	48.9
All Vehicles		423	5.2	0.207	0.7	NA	0.1	0.5	0.02	0.07	0.02	48.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 2 [2024_PM_During Construction_Loop Road and Cringila Car Park Road]

Loop Road and Cringila Car Park Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Loop Road													
Lane 1	8	25.0	1366	0.006	100	2.7	LOS A	0.0	0.2	Full	205	0.0	0.0
Approach	8	25.0		0.006		2.7	NA	0.0	0.2				
East: Cringila Car Park Road													
Lane 1	10	40.0	717	0.014	100	7.7	LOS A	0.1	0.5	Full	250	0.0	0.0
Approach	10	40.0		0.014		7.7	NA	0.1	0.5				
North: Loop Road													
Lane 1	405	4.0	1958	0.207	100	0.5	LOS A	0.0	0.0	Full	105	0.0	0.0
Approach	405	4.0		0.207		0.5	NA	0.0	0.0				
Intersection	423	5.2		0.207		0.7	NA	0.1	0.5				

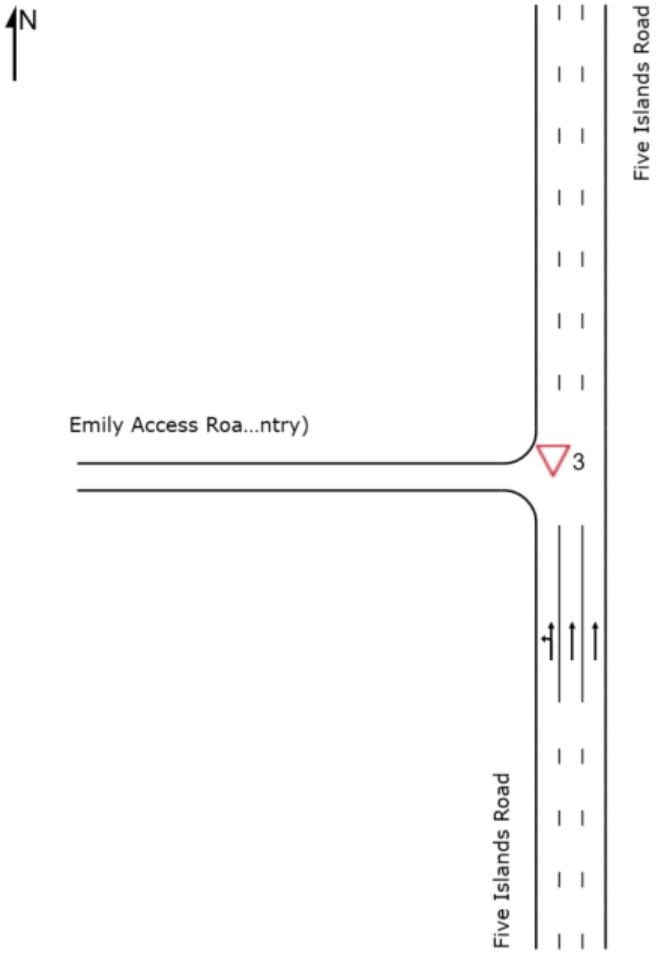
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 3: Five Islands Road and Emily Road (Entry)

SITE LAYOUT

Site: 3 [2021_AM_Base Case_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)



Site 3: Five Islands Road and Emily Road (Entry) 2021 AM Peak

MOVEMENT SUMMARY

▽ Site: 3 [2021_AM_Base Case_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	9	22.2	0.330	5.9	LOS A	0.0	0.0	0.00	0.01	0.00	51.5
2	T1	1791	8.4	0.330	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1800	8.4	0.330	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		1800	8.4	0.330	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 3 [2021_AM_Base Case_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	599	8.6	1816	0.330	100	0.2	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 2	600	8.4	1820	0.330	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 3	600	8.4	1820	0.330	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Approach	1800	8.4		0.330		0.1	NA	0.0	0.0				
Intersection	1800	8.4		0.330		0.1	NA	0.0	0.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 3: Five Islands Road and Emily Road (Entry) 2021 PM Peak

MOVEMENT SUMMARY

▽ Site: 3 [2021_PM_Base Case_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	16	0.0	0.270	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	51.9
2	T1	1483	5.7	0.270	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1499	5.6	0.270	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1499	5.6	0.270	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 3 [2021_PM_Base Case_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	95% Back of Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	500	5.5	1851	0.270	100	0.2	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 2	500	5.7	1851	0.270	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 3	500	5.7	1851	0.270	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Approach	1499	5.6		0.270		0.1	NA	0.0	0.0				
Intersection	1499	5.6		0.270		0.1	NA	0.0	0.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 3: Five Islands Road and Emily Road (Entry) 2024 AM Peak

MOVEMENT SUMMARY

▽ Site: 3 [2024_AM_During Construction_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	9	22.2	0.330	5.9	LOS A	0.0	0.0	0.00	0.01	0.00	51.5
2	T1	1791	8.4	0.330	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1800	8.4	0.330	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		1800	8.4	0.330	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 3 [2024_AM_During Construction_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	599	8.6	1816	0.330	100	0.2	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 2	600	8.4	1820	0.330	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 3	600	8.4	1820	0.330	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Approach	1800	8.4		0.330		0.1	NA	0.0	0.0				
Intersection	1800	8.4		0.330		0.1	NA	0.0	0.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 3: Five Islands Road and Emily Road (Entry) 2024 PM Peak

MOVEMENT SUMMARY

▽ Site: 3 [2024_PM_During Construction_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	16	0.0	0.270	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	51.9
2	T1	1483	5.7	0.270	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1499	5.6	0.270	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1499	5.6	0.270	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 3 [2024_PM_During Construction_Five Islands Road and Emily Access Road (Entry)]

Five Islands Road and Emily Access Road (Entry)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	95% Back of Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	500	5.5	1851	0.270	100	0.2	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 2	500	5.7	1851	0.270	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Lane 3	500	5.7	1851	0.270	100	0.1	LOS A	0.0	0.0	Full	1080	0.0	0.0
Approach	1499	5.6		0.270		0.1	NA	0.0	0.0				
Intersection	1499	5.6		0.270		0.1	NA	0.0	0.0				

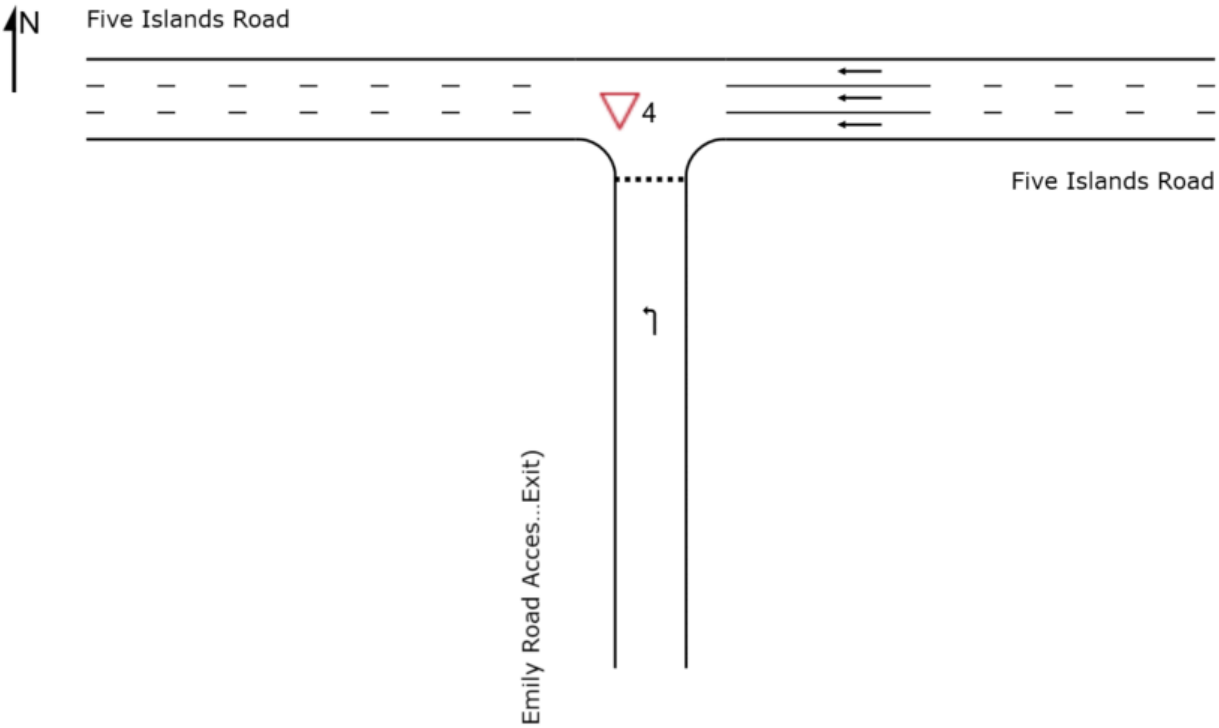
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 4: Five Islands Road and Emily Road (Exit)

SITE LAYOUT

Site: 4 [2021_AM_Base Case_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)



Site 4: Five Islands Road and Emily Road (Exit) 2021 AM Peak

MOVEMENT SUMMARY

▽ Site: 4 [2021_AM_Base Case_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Emily Road Access (Exit)												
1	L2	23	8.7	0.028	6.7	LOS A	0.1	0.8	0.53	0.67	0.53	31.4
Approach		23	8.7	0.028	6.7	LOS A	0.1	0.8	0.53	0.67	0.53	31.4
East: Five Islands Road												
5	T1	1772	8.4	0.325	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1772	8.4	0.325	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1795	8.4	0.325	0.1	NA	0.1	0.8	0.01	0.01	0.01	59.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 4 [2021_AM_Base Case_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Emily Road Access (Exit)													
Lane 1	23	8.7	809	0.028	100	6.7	LOS A	0.1	0.8	Full	50	0.0	0.0
Approach	23	8.7		0.028		6.7	LOS A	0.1	0.8				
East: Five Islands Road													
Lane 1	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 2	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 3	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Approach	1772	8.4		0.325		0.0	NA	0.0	0.0				
Intersection	1795	8.4		0.325		0.1	NA	0.1	0.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 4: Five Islands Road and Emily Road (Exit) 2021 PM Peak

MOVEMENT SUMMARY

▽ Site: 4 [2021_PM_Base Case_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Emily Road Access (Exit)												
1	L2	80	11.3	0.087	6.1	LOS A	0.3	2.6	0.50	0.67	0.50	32.0
Approach		80	11.3	0.087	6.1	LOS A	0.3	2.6	0.50	0.67	0.50	32.0
East: Five Islands Road												
5	T1	1474	5.7	0.265	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1474	5.7	0.265	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1554	6.0	0.265	0.3	NA	0.3	2.6	0.03	0.03	0.03	58.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 4 [2021_PM_Base Case_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Emily Road Access (Exit)													
Lane 1	80	11.3	917	0.087	100	6.1	LOS A	0.3	2.6	Full	50	0.0	0.0
Approach	80	11.3		0.087		6.1	LOS A	0.3	2.6				
East: Five Islands Road													
Lane 1	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 2	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 3	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Approach	1474	5.7		0.265		0.0	NA	0.0	0.0				
Intersection	1554	6.0		0.265		0.3	NA	0.3	2.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 4: Five Islands Road and Emily Road (Exit) 2024 AM Peak

MOVEMENT SUMMARY

▽ Site: 4 [2024_AM_During Construction_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Emily Road Access (Exit)												
1	L2	23	8.7	0.028	6.7	LOS A	0.1	0.8	0.53	0.67	0.53	31.4
Approach		23	8.7	0.028	6.7	LOS A	0.1	0.8	0.53	0.67	0.53	31.4
East: Five Islands Road												
5	T1	1772	8.4	0.325	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1772	8.4	0.325	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1795	8.4	0.325	0.1	NA	0.1	0.8	0.01	0.01	0.01	59.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 4 [2024_AM_During Construction_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Emily Road Access (Exit)													
Lane 1	23	8.7	809	0.028	100	6.7	LOS A	0.1	0.8	Full	50	0.0	0.0
Approach	23	8.7		0.028		6.7	LOS A	0.1	0.8				
East: Five Islands Road													
Lane 1	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 2	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 3	591	8.4	1820	0.325	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Approach	1772	8.4		0.325		0.0	NA	0.0	0.0				
Intersection	1795	8.4		0.325		0.1	NA	0.1	0.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 4: Five Islands Road and Emily Road (Exit) 2024 PM Peak

MOVEMENT SUMMARY

▽ Site: 4 [2024_PM_During Construction_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Emily Road Access (Exit)												
1	L2	291	6.9	0.307	6.7	LOS A	1.5	10.9	0.56	0.77	0.61	31.5
Approach		291	6.9	0.307	6.7	LOS A	1.5	10.9	0.56	0.77	0.61	31.5
East: Five Islands Road												
5	T1	1474	5.7	0.265	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1474	5.7	0.265	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1765	5.9	0.307	1.1	NA	1.5	10.9	0.09	0.13	0.10	54.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 4 [2024_PM_During Construction_Five Islands Road and Emily Road Access (Exit)]

Five Islands Road and Emily Road Access (Exit)
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Emily Road Access (Exit)													
Lane 1	291	6.9	948	0.307	100	6.7	LOS A	1.5	10.9	Full	50	0.0	0.0
Approach	291	6.9		0.307		6.7	LOS A	1.5	10.9				
East: Five Islands Road													
Lane 1	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 2	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Lane 3	491	5.7	1851	0.265	100	0.0	LOS A	0.0	0.0	Full	135	0.0	0.0
Approach	1474	5.7		0.265		0.0	NA	0.0	0.0				
Intersection	1765	5.9		0.307		1.1	NA	1.5	10.9				

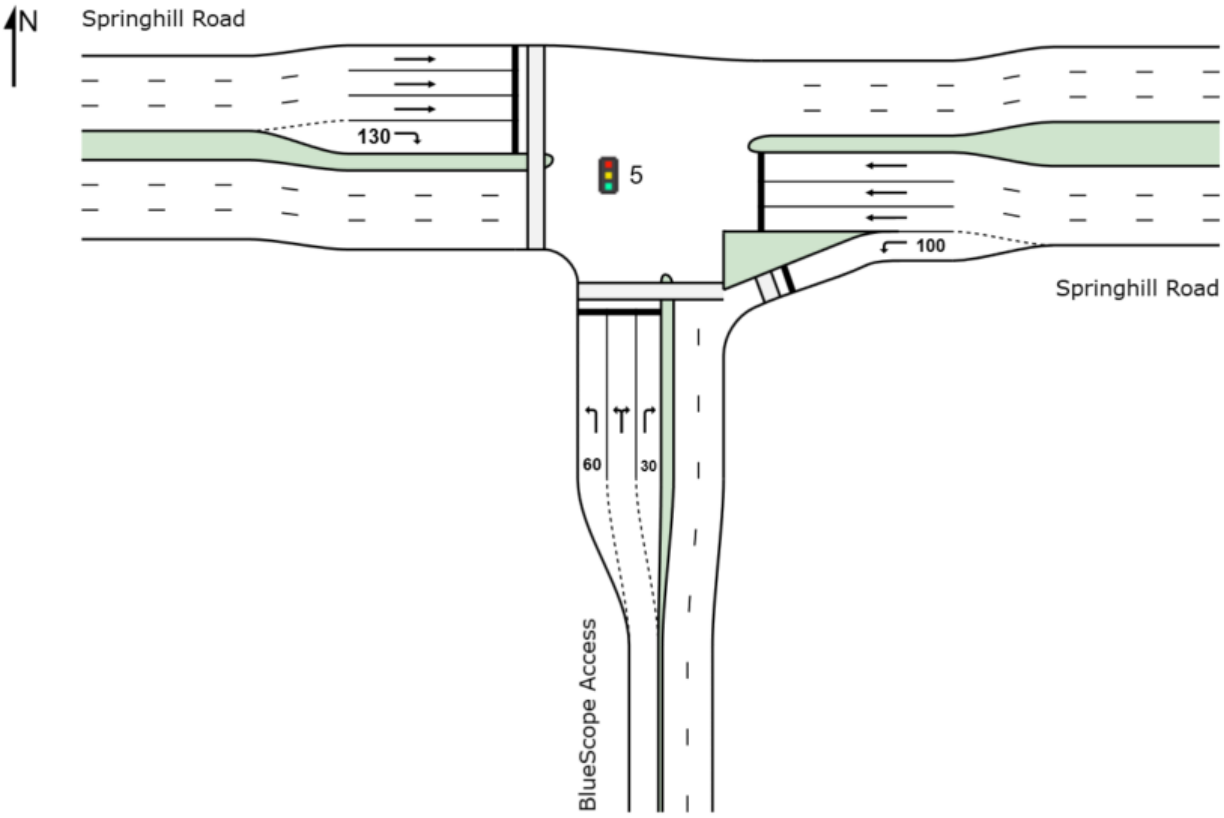
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 5: Springhill Road and BlueScope Access Road (Exit)

SITE LAYOUT

Site: 5 [2021_AM_Base Case_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated



Site 5: Springhill Road and BlueScope Access Road (Exit) 2021 AM Peak

MOVEMENT SUMMARY

Site: 5 [2021_AM_Base Case_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: BlueScope Access												
1	L2	24	70.8	0.045	23.2	LOS B	0.4	4.1	0.77	0.67	0.77	30.0
3	R2	12	0.0	0.045	30.7	LOS C	0.3	2.6	0.90	0.66	0.90	29.4
Approach		36	47.2	0.045	25.7	LOS B	0.4	4.1	0.81	0.66	0.81	29.8
East: Springhill Road												
4	L2	25	12.0	0.145	36.0	LOS C	0.7	5.5	0.94	0.71	0.94	28.0
5	T1	497	12.5	0.308	17.9	LOS B	3.9	30.3	0.81	0.66	0.81	57.4
Approach		522	12.5	0.308	18.8	LOS B	3.9	30.3	0.82	0.66	0.82	56.0
West: Springhill Road												
11	T1	1315	7.1	0.797	25.3	LOS B	13.5	100.6	0.98	0.94	1.17	51.3
12	R2	45	35.6	0.293	37.2	LOS C	1.3	12.2	0.96	0.74	0.96	35.8
Approach		1360	8.1	0.797	25.7	LOS B	13.5	100.6	0.98	0.93	1.17	50.8
All Vehicles		1918	10.0	0.797	23.8	LOS B	13.5	100.6	0.93	0.85	1.07	51.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 5 [2021_AM_Base Case_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: BlueScope Access													
Lane 1	17	70.8	374	0.045	100	21.4	LOS B	0.4	4.1	Short	60	0.0	NA
Lane 2	11	46.4	235	0.045	100	27.5	LOS B	0.3	2.6	Full	80	0.0	0.0
Lane 3	8	0.0	183	0.045	100	32.2	LOS C	0.2	1.6	Short	30	0.0	NA
Approach	36	47.2		0.045		25.7	LOS B	0.4	4.1				
East: Springhill Road													
Lane 1	25	12.0	173	0.145	100	36.0	LOS C	0.7	5.5	Short	100	0.0	NA
Lane 2	164	12.5	533	0.308	100	17.9	LOS B	3.8	29.5	Full	370	0.0	0.0
Lane 3	164	12.5	533	0.308	100	17.9	LOS B	3.8	29.5	Full	370	0.0	0.0
Lane 4	169	12.5	547	0.308	100	17.9	LOS B	3.9	30.3	Full	370	0.0	0.0
Approach	522	12.5		0.308		18.8	LOS B	3.9	30.3				
West: Springhill Road													
Lane 1	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 2	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 3	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 4	45	35.6	154	0.293	100	37.2	LOS C	1.3	12.2	Short	130	0.0	NA
Approach	1360	8.1		0.797		25.7	LOS B	13.5	100.6				
Intersection	1918	10.0		0.797		23.8	LOS B	13.5	100.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 5: Springhill Road and BlueScope Access Road (Exit) 2021 PM Peak

MOVEMENT SUMMARY

Site: 5 [2021_PM_Base Case_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: BlueScope Access												
1	L2	52	17.3	0.080	17.0	LOS B	0.8	6.3	0.70	0.69	0.70	42.2
3	R2	32	3.1	0.080	26.5	LOS B	0.4	3.1	0.91	0.68	0.91	31.4
Approach		84	11.9	0.080	20.6	LOS B	0.8	6.3	0.78	0.68	0.78	38.4
East: Springhill Road												
4	L2	6	16.7	0.030	29.7	LOS C	0.1	1.1	0.91	0.65	0.91	31.3
5	T1	391	3.1	0.429	21.8	LOS B	3.1	22.4	0.94	0.75	0.94	54.1
Approach		397	3.3	0.429	21.9	LOS B	3.1	22.4	0.94	0.74	0.94	53.8
West: Springhill Road												
11	T1	529	4.5	0.591	22.8	LOS B	4.3	31.5	0.97	0.80	1.03	53.3
12	R2	12	58.3	0.074	30.9	LOS C	0.3	3.0	0.91	0.68	0.91	38.9
Approach		541	5.7	0.591	23.0	LOS B	4.3	31.5	0.97	0.80	1.02	53.0
All Vehicles		1022	5.3	0.591	22.3	LOS B	4.3	31.5	0.95	0.77	0.97	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 5 [2021_PM_Base Case_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: BlueScope Access													
Lane 1	48	17.3	601	0.080	100	16.2	LOS B	0.8	6.3	Short	60	0.0	NA
Lane 2	19	6.1	235	0.080	100	25.9	LOS B	0.4	3.1	Full	80	0.0	0.0
Lane 3	17	3.1	215	0.080	100	26.9	LOS B	0.4	2.8	Short	30	0.0	NA
Approach	84	11.9		0.080		20.6	LOS B	0.8	6.3				
East: Springhill Road													
Lane 1	6	16.7	201	0.030	100	29.7	LOS C	0.1	1.1	Short	100	0.0	NA
Lane 2	129	3.1	301	0.429	100	21.8	LOS B	3.0	21.8	Full	370	0.0	0.0
Lane 3	129	3.1	301	0.429	100	21.8	LOS B	3.0	21.8	Full	370	0.0	0.0
Lane 4	133	3.1	309	0.429	100	21.7	LOS B	3.1	22.4	Full	370	0.0	0.0
Approach	397	3.3		0.429		21.9	LOS B	3.1	22.4				
West: Springhill Road													
Lane 1	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 2	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 3	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 4	12	58.3	163	0.074	100	30.9	LOS C	0.3	3.0	Short	130	0.0	NA
Approach	541	5.7		0.591		23.0	LOS B	4.3	31.5				
Intersection	1022	5.3		0.591		22.3	LOS B	4.3	31.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 5: Springhill Road and BlueScope Access Road (Exit) 2024 AM Peak

MOVEMENT SUMMARY

Site: 5 [2024_AM_During Construction_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: BlueScope Access												
1	L2	24	70.8	0.045	23.2	LOS B	0.4	4.1	0.77	0.67	0.77	30.0
3	R2	12	0.0	0.045	30.7	LOS C	0.3	2.6	0.90	0.66	0.90	29.4
Approach		36	47.2	0.045	25.7	LOS B	0.4	4.1	0.81	0.66	0.81	29.8
East: Springhill Road												
4	L2	29	10.3	0.166	36.0	LOS C	0.8	6.4	0.95	0.71	0.95	28.0
5	T1	497	12.5	0.308	17.9	LOS B	3.9	30.3	0.81	0.66	0.81	57.4
Approach		526	12.4	0.308	18.9	LOS B	3.9	30.3	0.82	0.67	0.82	55.8
West: Springhill Road												
11	T1	1315	7.1	0.797	25.3	LOS B	13.5	100.6	0.98	0.94	1.17	51.3
12	R2	56	28.6	0.350	37.3	LOS C	1.7	14.5	0.97	0.75	0.97	35.8
Approach		1371	8.0	0.797	25.8	LOS B	13.5	100.6	0.98	0.93	1.17	50.7
All Vehicles		1933	9.9	0.797	23.9	LOS B	13.5	100.6	0.93	0.85	1.07	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 5 [2024_AM_During Construction_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: BlueScope Access													
Lane 1	17	70.8	374	0.045	100	21.4	LOS B	0.4	4.1	Short	60	0.0	NA
Lane 2	11	46.4	235	0.045	100	27.5	LOS B	0.3	2.6	Full	80	0.0	0.0
Lane 3	8	0.0	183	0.045	100	32.2	LOS C	0.2	1.6	Short	30	0.0	NA
Approach	36	47.2		0.045		25.7	LOS B	0.4	4.1				
East: Springhill Road													
Lane 1	29	10.3	175	0.166	100	36.0	LOS C	0.8	6.4	Short	100	0.0	NA
Lane 2	164	12.5	533	0.308	100	17.9	LOS B	3.8	29.5	Full	370	0.0	0.0
Lane 3	164	12.5	533	0.308	100	17.9	LOS B	3.8	29.5	Full	370	0.0	0.0
Lane 4	169	12.5	547	0.308	100	17.9	LOS B	3.9	30.3	Full	370	0.0	0.0
Approach	526	12.4		0.308		18.9	LOS B	3.9	30.3				
West: Springhill Road													
Lane 1	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 2	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 3	438	7.1	550	0.797	100	25.3	LOS B	13.5	100.6	Full	620	0.0	0.0
Lane 4	56	28.6	160	0.350	100	37.3	LOS C	1.7	14.5	Short	130	0.0	NA
Approach	1371	8.0		0.797		25.8	LOS B	13.5	100.6				
Intersection	1933	9.9		0.797		23.9	LOS B	13.5	100.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 5: Springhill Road and BlueScope Access Road (Exit) 2024 PM Peak

MOVEMENT SUMMARY

Site: 5 [2024_PM_During Construction_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: BlueScope Access												
1	L2	63	14.3	0.092	17.3	LOS B	0.9	7.3	0.71	0.69	0.71	42.7
3	R2	36	2.8	0.092	26.5	LOS B	0.5	3.7	0.91	0.69	0.91	31.4
Approach		99	10.1	0.092	20.6	LOS B	0.9	7.3	0.78	0.69	0.78	38.9
East: Springhill Road												
4	L2	6	16.7	0.030	29.7	LOS C	0.1	1.1	0.91	0.65	0.91	31.3
5	T1	391	3.1	0.429	21.8	LOS B	3.1	22.4	0.94	0.75	0.94	54.1
Approach		397	3.3	0.429	21.9	LOS B	3.1	22.4	0.94	0.74	0.94	53.8
West: Springhill Road												
11	T1	529	4.5	0.591	22.8	LOS B	4.3	31.5	0.97	0.80	1.03	53.3
12	R2	12	58.3	0.074	30.9	LOS C	0.3	3.0	0.91	0.68	0.91	38.9
Approach		541	5.7	0.591	23.0	LOS B	4.3	31.5	0.97	0.80	1.02	53.0
All Vehicles		1037	5.2	0.591	22.3	LOS B	4.3	31.5	0.94	0.77	0.97	52.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 5 [2024_PM_During Construction_Springhill Road and BlueScope Access]

Springhill Road and BlueScope Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: BlueScope Access													
Lane 1	57	14.3	613	0.092	100	16.3	LOS B	0.9	7.3	Short	60	0.0	NA
Lane 2	23	6.1	244	0.092	100	25.9	LOS B	0.5	3.7	Full	80	0.0	0.0
Lane 3	20	2.8	215	0.092	100	27.0	LOS B	0.5	3.3	Short	30	0.0	NA
Approach	99	10.1		0.092		20.6	LOS B	0.9	7.3				
East: Springhill Road													
Lane 1	6	16.7	201	0.030	100	29.7	LOS C	0.1	1.1	Short	100	0.0	NA
Lane 2	129	3.1	301	0.429	100	21.8	LOS B	3.0	21.8	Full	370	0.0	0.0
Lane 3	129	3.1	301	0.429	100	21.8	LOS B	3.0	21.8	Full	370	0.0	0.0
Lane 4	133	3.1	309	0.429	100	21.7	LOS B	3.1	22.4	Full	370	0.0	0.0
Approach	397	3.3		0.429		21.9	LOS B	3.1	22.4				
West: Springhill Road													
Lane 1	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 2	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 3	176	4.5	298	0.591	100	22.8	LOS B	4.3	31.5	Full	620	0.0	0.0
Lane 4	12	58.3	163	0.074	100	30.9	LOS C	0.3	3.0	Short	130	0.0	NA
Approach	541	5.7		0.591		23.0	LOS B	4.3	31.5				
Intersection	1037	5.2		0.591		22.3	LOS B	4.3	31.5				

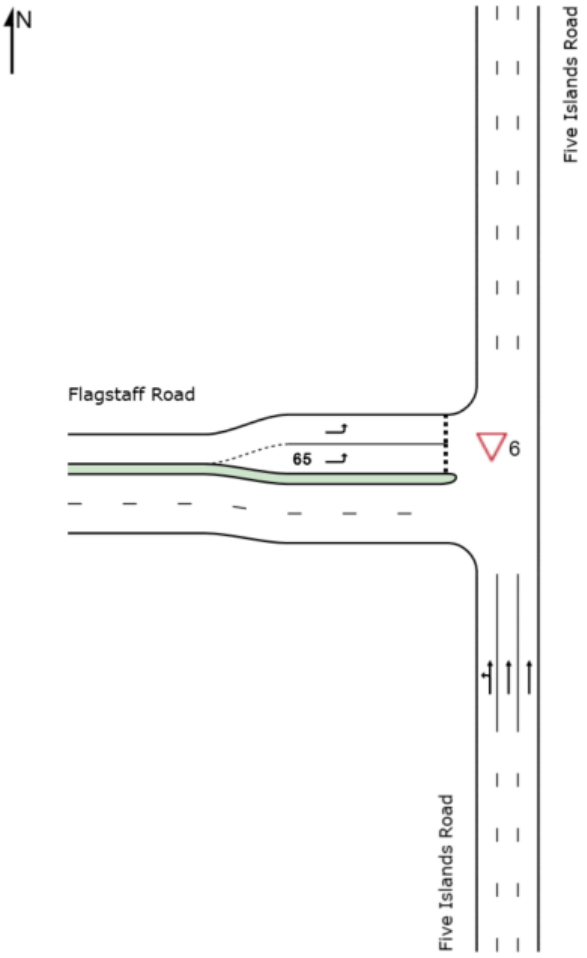
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 6: Five Islands Road and Flagstaff Road

SITE LAYOUT

Site: 6 [2021_AM_Base Case_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)



Site 6: Five Islands Road and Flagstaff Road 2021 AM Peak

MOVEMENT SUMMARY

▽ Site: 6 [2021_AM_Base Case_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	8	100.0	0.307	6.1	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
2	T1	1690	5.8	0.307	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1698	6.2	0.307	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: Flagstaff Road												
10	L2	19	21.1	0.020	10.7	LOS A	0.1	0.6	0.59	0.70	0.59	33.7
Approach		19	21.1	0.020	10.7	LOS A	0.1	0.6	0.59	0.70	0.59	33.7
All Vehicles		1717	6.4	0.307	0.2	NA	0.1	0.6	0.01	0.01	0.01	59.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 6 [2021_AM_Base Case_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	562	7.1	1831	0.307	100	0.2	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 2	568	5.8	1850	0.307	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 3	568	5.8	1850	0.307	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Approach	1698	6.2		0.307		0.1	NA	0.0	0.0				
West: Flagstaff Road													
Lane 1	15	21.1	782	0.020	100	7.6	LOS A	0.1	0.6	Full	200	0.0	0.0
Lane 2	4	21.1	178	0.020	100	24.1	LOS B	0.1	0.5	Short	65	0.0	NA
Approach	19	21.1		0.020		10.7	LOS A	0.1	0.6				
Intersection	1717	6.4		0.307		0.2	NA	0.1	0.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 6: Five Islands Road and Flagstaff Road 2021 PM Peak

MOVEMENT SUMMARY

▽ Site: 6 [2021_PM_Base Case_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	5	0.0	0.228	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
2	T1	1280	3.6	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1285	3.6	0.228	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Flagstaff Road												
10	L2	32	3.1	0.022	7.8	LOS A	0.1	0.6	0.52	0.66	0.52	37.5
Approach		32	3.1	0.022	7.8	LOS A	0.1	0.6	0.52	0.66	0.52	37.5
All Vehicles		1317	3.6	0.228	0.2	NA	0.1	0.6	0.01	0.02	0.01	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 6 [2021_PM_Base Case_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	428	3.6	1875	0.228	100	0.1	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 2	428	3.6	1876	0.228	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 3	428	3.6	1876	0.228	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Approach	1285	3.6		0.228		0.0	NA	0.0	0.0				
West: Flagstaff Road													
Lane 1	23	3.1	1064	0.022	100	6.1	LOS A	0.1	0.6	Full	200	0.0	0.0
Lane 2	9	3.1	423	0.022	100	12.1	LOS A	0.1	0.5	Short	65	0.0	NA
Approach	32	3.1		0.022		7.8	LOS A	0.1	0.6				
Intersection	1317	3.6		0.228		0.2	NA	0.1	0.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 6: Five Islands Road and Flagstaff Road 2024 AM Peak

MOVEMENT SUMMARY

▽ Site: 6 [2024_AM_During Construction_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	97	12.4	0.324	5.7	LOS A	0.0	0.0	0.00	0.10	0.00	54.0
2	T1	1690	5.8	0.324	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.5
Approach		1787	6.2	0.324	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.1
West: Flagstaff Road												
10	L2	19	21.1	0.019	10.1	LOS A	0.1	0.6	0.55	0.67	0.55	34.2
Approach		19	21.1	0.019	10.1	LOS A	0.1	0.6	0.55	0.67	0.55	34.2
All Vehicles		1806	6.3	0.324	0.4	NA	0.1	0.6	0.01	0.04	0.01	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 6 [2024_AM_During Construction_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	589	6.9	1820	0.324	100	1.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 2	599	5.8	1850	0.324	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 3	599	5.8	1850	0.324	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Approach	1787	6.2		0.324		0.3	NA	0.0	0.0				
West: Flagstaff Road													
Lane 1	16	21.1	853	0.019	100	7.1	LOS A	0.1	0.6	Full	200	0.0	0.0
Lane 2	3	21.1	160	0.019	100	26.3	LOS B	0.1	0.5	Short	65	0.0	NA
Approach	19	21.1		0.019		10.1	LOS A	0.1	0.6				
Intersection	1806	6.3		0.324		0.4	NA	0.1	0.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site 6: Five Islands Road and Flagstaff Road 2024 PM Peak

MOVEMENT SUMMARY

▽ Site: 6 [2024_PM_During Construction_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Five Islands Road												
1	L2	5	0.0	0.228	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
2	T1	1280	3.6	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1285	3.6	0.228	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Flagstaff Road												
10	L2	32	3.1	0.022	7.8	LOS A	0.1	0.6	0.52	0.66	0.52	37.5
Approach		32	3.1	0.022	7.8	LOS A	0.1	0.6	0.52	0.66	0.52	37.5
All Vehicles		1317	3.6	0.228	0.2	NA	0.1	0.6	0.01	0.02	0.01	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

▽ Site: 6 [2024_PM_During Construction_Five Islands Road and Flagstaff Road]

Five Islands Road and Flagstaff Road
Site Category: (None)
Giveway / Yield (Two-Way)

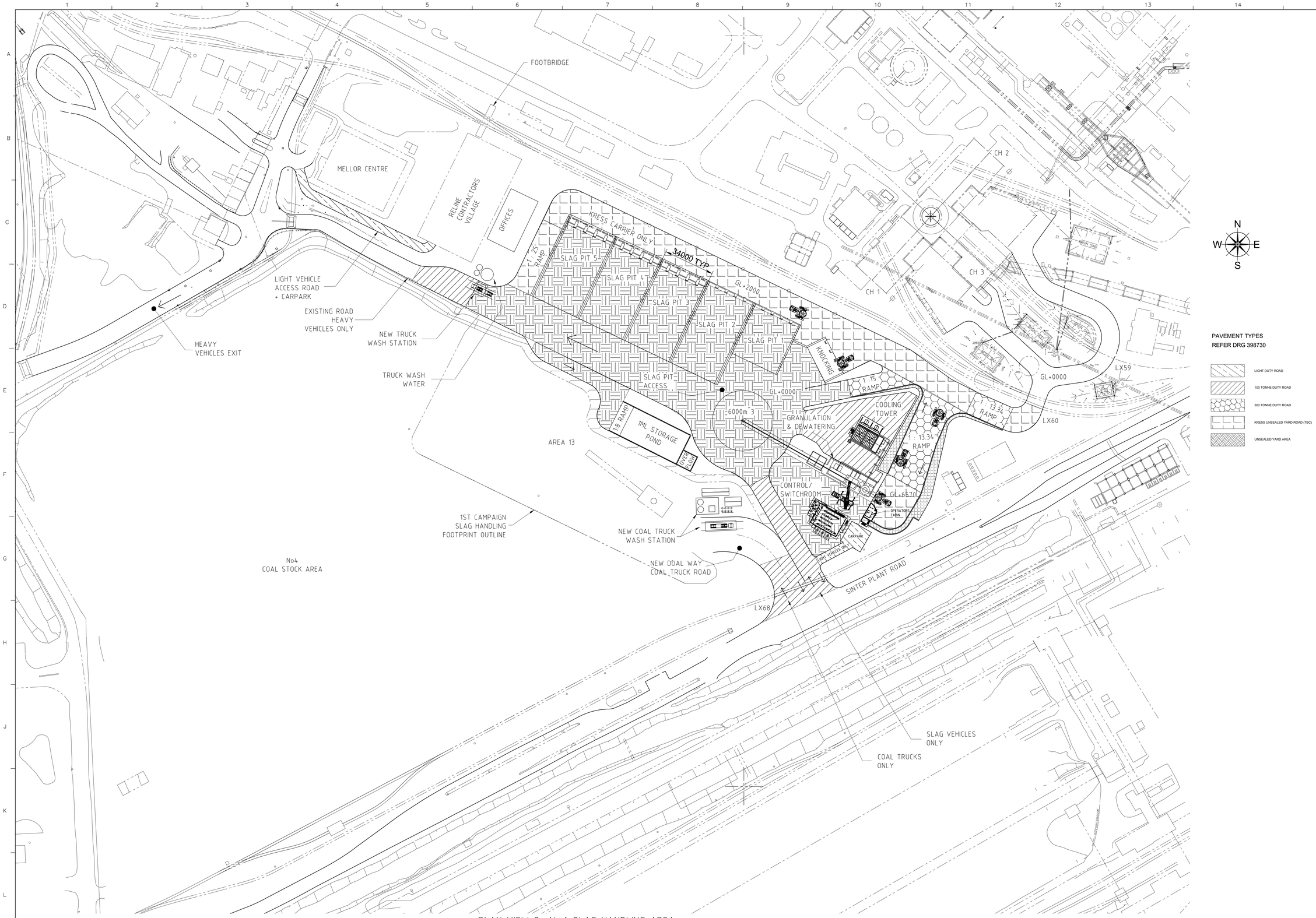
Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Five Islands Road													
Lane 1	428	3.6	1875	0.228	100	0.1	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 2	428	3.6	1876	0.228	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Lane 3	428	3.6	1876	0.228	100	0.0	LOS A	0.0	0.0	Full	390	0.0	0.0
Approach	1285	3.6		0.228		0.0	NA	0.0	0.0				
West: Flagstaff Road													
Lane 1	23	3.1	1064	0.022	100	6.1	LOS A	0.1	0.6	Full	200	0.0	0.0
Lane 2	9	3.1	423	0.022	100	12.1	LOS A	0.1	0.5	Short	65	0.0	NA
Approach	32	3.1		0.022		7.8	LOS A	0.1	0.6				
Intersection	1317	3.6		0.228		0.2	NA	0.1	0.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C

Slag handling area pavement upgrade



PLAN VIEW On No.6 SLAG HANDLING AREA

SCALE 1:1000

C DATE 12/10/2021 PROJECT/WBS No - CHANGE APPROVAL No -	B DATE 02/09/21 PROJECT/WBS No - CHANGE APPROVAL No -	A DATE 21/07/21 PROJECT/WBS No - CHANGE APPROVAL No -
DRAWING STATUS:	DRAWING STATUS:	DRAWING STATUS: ISSUED FOR COMMENT
REVISED PAVEMENT TYPES - - -	REVISED KRESS HAUL ROADS - - -	NEW DRAWING - - -
DRAWN: L. CICCARELLI CHECKED: L. CICCARELLI	DRAWN: L. CICCARELLI CHECKED:	DRAWN: L. CICCARELLI CHECKED: -
O/No, CONT. NAME & REF No: -	O/No, CONT. NAME & REF No: -	O/No, CONT. NAME & REF No: -
DE/SPEC: -	DE/SPEC: -	DE/SPEC: -
DE/SPEC: -	DE/SPEC: -	DE/SPEC: -
RESP ENG: L. CICCARELLI REGN APPR: P. DI PIETRO	RESP ENG: L. CICCARELLI REGN APPR: P. DI PIETRO	RESP ENG: L. CICCARELLI REGN APPR: P. DI PIETRO

DRAWING REVISIONS

FUNCTIONAL LOCATION CODES -

INDEX CODES -

REFERENCE DRAWINGS -

Port Kembla Steelworks

DISC. ENGINEER OR SPECIALIST: L. CICCARELLI | SUPERVISOR: - | ORDER No: | CONTRACTOR/SUPPLIER REF No: -

CONTRACTOR DETAILS

B1

No.6 BLAST FURNACE
SERVICES
SLAG HANDLING
LAYOUT AND ARRANGEMENTS
CONCEPT PAVEMENT TYPES

CHANGE APPROVAL NUMBER: | PROJECT/WBS No:

DRAWN: L. CICCARELLI | CHECKED: | DISC. ENGINEER OR SPECIALIST:

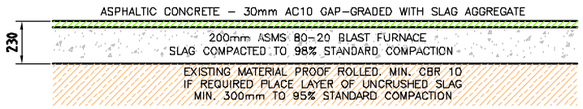
DISC. ENGINEER OR SPECIALIST: | RESPONSIBLE ENGINEER: | REGISTRATION APPROVAL:

AUTOCAD FILE NAME: SLG-DWG-MECH-BSL-6BFPROP0035-C.DWG AUTOCAD PRINT: 12/10/2021 09:09 AM

DATE DRN: 21/07/21 | SCALE: 1:1000 | DRAWING No: **6BFPROP0035** | DRAWING STATUS: ISSUED FOR COMMENT | REV No: C

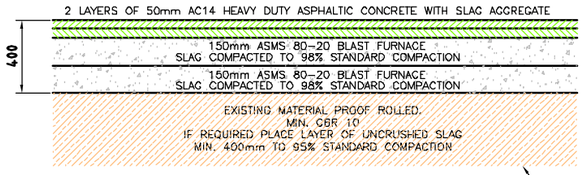
FULL SIZE 0 50 100 150 200 250 300

A1 | DRG CREATED WITH AUTOCAD 2000



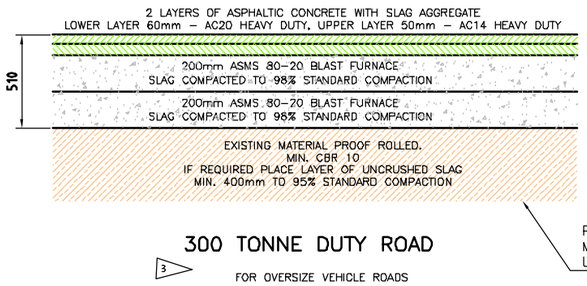
3 **LIGHT DUTY ROAD**

FOR GENERAL ROADS, OCCASIONAL HEAVY VEHICLES



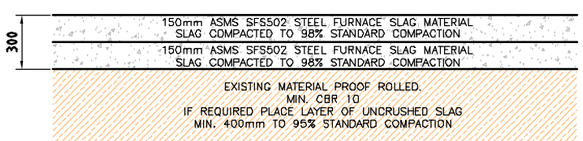
3 **100 TONNE DUTY ROAD**

FOR HEAVY HAULAGE ROADS, OCCASIONAL OVERSIZE VEHICLES



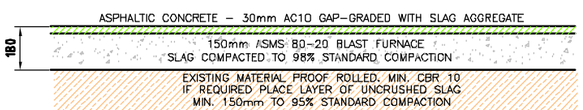
3 **300 TONNE DUTY ROAD**

FOR OVERSIZE VEHICLE ROADS

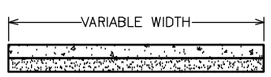


3 **UNSEALED YARD AREA**

FOR HEAVY VEHICLES
DO NOT USE SFS502 MATERIAL IF AREA IS TO BE AC SEALED

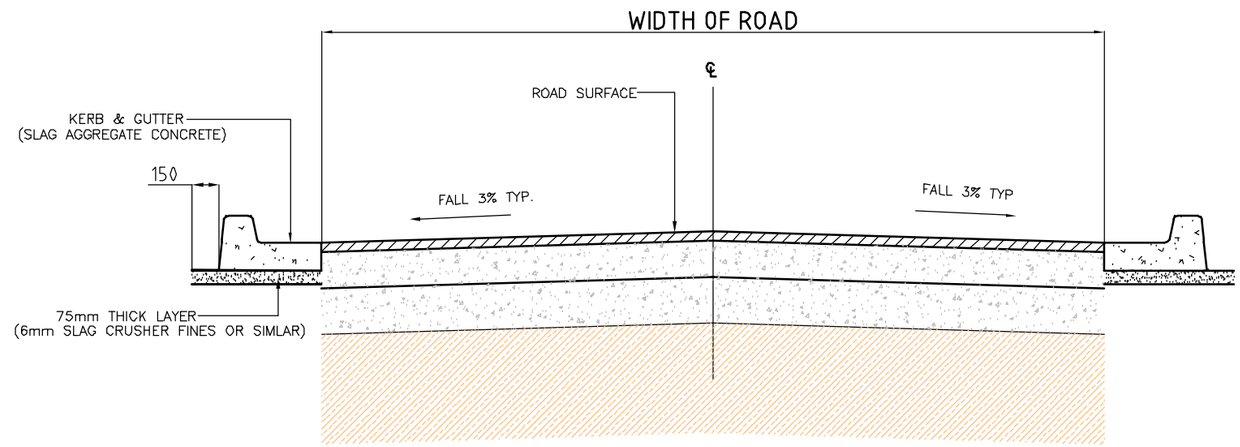


3 **CARPARK**



FOOTPATH
TYPICAL SECTION
SCALE 1:16

75mm 25MPa CONCRETE
75mm THICK LAYER – 6mm SLAG CRUSHER FINES
WITH SL62 MESH, 30 TOP COVER 2



ROAD
TYPICAL SECTION
NOT TO SCALE

3

PAVEMENT NOTES

1. THESE TYPICAL PAVEMENTS ARE A GUIDANCE ONLY. THE SELECTION OF THE APPROPRIATE PAVEMENT IS TO BE DESIGNED BY A SUITABLY QUALIFIED DESIGN ENGINEER TAKING INTO ACCOUNT TRAFFIC VOLUMES, DUTY LIFE, SUB–BASE SOIL CONDITIONS AND PERFORMANCE REQUIREMENTS.

2. ASPHALTIC CONCRETES TO CONFORM TO RTA SPECIFICATION R116 FOR HEAVY DUTY ASPHALT AND AS2150

3. TYPICAL PAVEMENT CONSTRUCTION FOR PORT KEMBLA STEELWORKS SITE ONLY. GEOTECHNICAL INVESTIGATION SHOULD BE CARRIED OUT ON SUB–BASES LESS THAN CBR 10

4. POLYMER MODIFIED BINDER SHALL BE CONSIDERED IN ASPHALTIC CONCRETE BY THE DESIGN ENGINEER FOR ROUNDABOUTS WITH HEAVY TRAFFIC LOADS.

5. CONCRETE PAVEMENTS CAN ALSO BE CONSIDERED FOR SPECIAL LOAD SITUATIONS.

6. 2 COAT SPPAY SEAL CAN BE USED FOR LIGHT ROADS AND CARPARKS. DESIGN ENGINEER TO INVOLVED.

7. ROADBASE MATERIALS TO CONFORM TO RTA SPECIFICATION 3052

ROAD CROSSFALLS – TYPICAL PAVEMENT CROSSFALLS.

ROAD SURFACE	TRAFFIC LANE (%).	SHOULDER (%).
CEMENT CONCRETE	2.0 – 3.0	2.0 – 4.0
ASPHALTIC CONCRETE	2.5 – 3.0	2.5 – 4.0
SPRAYED SEAL	3.0 – 4.0	3.0 – 4.0
UNSEALED	1.0 – 2.0	1.0 – 2.0

REFERENCES

RTA ROAD DESIGN GUIDE
AS 1742.1
AS 1742.2
AS 1742.7
AS 1742.10
AS 1742.11
AS 1742.13
AS 2150
RTA SPECIFICATION R116

ROAD WIDTHS

ROAD CLASSIFICATION	WIDTH (m).
SERVICE	7
ARTERIAL	9
OVERSIZE VEHICLE	10 / 12

FOOTWAY CROSSFALLS

MINIMUM	DESIRABLE	MAXIMUM
2%	3%	5%

DENOTES REVISIONS OF SK68945–SHEET3
PAVEMENT DEPTHS CHANGED
SELECT MATERIAL ZONE ADDED
ROAD WIDTH CHANGED

NOTE:

THIS DRAWING SUPERSEDES BSL DWG SK68945_SHEET 3

No. OFF	ITEM	DESCRIPTION	REMARKS	MATERIAL No.

BLUESCOPE STEEL — Port Kembla Steelworks

DRAWING PRODUCED BY :-
TECHNOLOGY & ENVIRONMENT DEPARTMENT
INDUSTRIAL ARCHITECTURE
AUTOCAD SAVE NAME: 398730_002
CONTRACTOR/SUPPLIER REF No:

CONTRACTOR IDENTIFICATION

GENERAL WORKS
CIVIL STANDARDS
ROADS
ROAD PAVEMENT TYPES & CROSS SECTION DETAILS

RESPONSIBLE ENGINEER | SUPERVISOR
ORDER No:
EWR/TASK:
TITLE BLOCK TO COMPLY WITH SP-ENG-DES-196

REFERENCE DRAWINGS
SK68945 - SHEET 3

CHANGE APPROVAL NUMBER:

DRAWN	CHECKED	RESPONSIBLE ENGINEER
ROBYN JACKSON, PEA	DAVID DE SANTI	DAVID DE SANTI

SCALE 1:16	DISC. ENGINEER / SPECIALIST	DISC. ENGINEER / SPECIALIST	REGISTRATION APPROVAL
DATE DRN. 28/12/15			DAVID DE SANTI

INDEX CODE No'S
A1-38-004

398730
APPROVED FOR CONSTRUCTION

3

DRAWING AMENDMENT

EWR/TASK:	DATE:	EWR/TASK:	DATE:	EWR/TASK:	DATE:	EWR/TASK:	DATE:	EWR/TASK:	DATE:	EWR/TASK:	DATE: 24/2/89	EWR/TASK	DATE: 18/09/17	EWR/TASK	DATE: 28/12/15
CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:		CHANGE APPROVAL No:	
CONTR:		CONTR:		CONTR:		CONTR:		CONTR:		CONTR:		CONTR:		CONTR:	
										3 PAVEMENT CROSS-SECTIONS AMENDED PAVEMENT NOTES ADDED		2 NOTES ADDED CONCRETE DEPTHS EDITED		1 NEW DRAWING	
DRAWN		DRAWN		DRAWN		DRAWN		DRAWN		DRAWN: DAVID DE SANTI		DRAWN: D.FREEMAN		DRAWN: R.JACKSON	
RESP ENG:		RESP ENG:		RESP ENG:		RESP ENG:		RESP ENG:		RESP ENG: DAVID DE SANTI		RESP ENG: DAVID DE SANTI		RESP ENG: DAVID DE SANTI	
REGN APPROVAL:		REGN APPROVAL:		REGN APPROVAL:		REGN APPROVAL:		REGN APPROVAL:		REGN APPROVAL: DAVID DE SANTI		REGN APPROVAL: DAVID DE SANTI		REGN APPROVAL: DAVID DE SANTI	

FULL SIZE 0 50 100 150 200 250 300

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