Appendix 4

Traffic Assessment

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ABN: 45 050 224 250

Possum Brush Quarry

Stage 2 Operations and the Modification of Development Consent DA 283/97

Traffic Assessment

Prepared by

Constructive Solutions Pty Ltd

November 2015

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Traffic Assessment

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CONTENTS

Page

CONTENTS

Page

COMMONLY USED ACRONYMS

AADT	Average Annual Daily Traffic
AUL	Auxiliary left turn lane
BAL	Basic left turn lane
BAR	Basic right turn lane
BB	Double unbroken lines
CHL	Channelised left turn lane
CHR	Channelised right turn lane
DoS	Degree of Saturation
LoS	Level of Service
MR	Main Road
RMS	Roads and Maritime Services
SIDRA	Signalised and un-signalised Intersection Design and Research Aid
TMP	Traffic Management Plan

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EXECUTIVE SUMMARY

This report has been prepared for R.W. Corkery & Co. Pty Limited on behalf of Pacific Blue Metal Pty Ltd (PBM) to assess traffic-related impacts of the proposed ongoing operation of Possum Brush Quarry (the Proposal). The report will form part of an *Environmental Assessment* for the Proposal.

The proposal is for the ongoing operation of the Possum Brush Quarry ("the Quarry") and to modify Development Consent DA 283/97 (Modification 3) for the Quarry. The ongoing operation of the Quarry and its proposed modification are referred to as the 'Proposal' throughout this document. The Quarry is located approximately 2km west of the Pacific Highway at Possum Brush, 4km northwest of Failford and 5km northeast of Nabiac.

PBM's application relates to:

i) formally presenting the activities for the ongoing operation of the Quarry throughout the next 30 years, i.e. Stage 2 of the Quarry; and

ii) PBM's proposed increase in the production levels at the Quarry throughout Stage 2 of the Quarry life.

The assessment has been prepared in accordance with the NSW Roads and Traffic Authority's (RTA) (2002) Guide to Traffic Generating Developments (now Roads and Maritime Services) and the Austroads Road Design Guide, and addresses relevant matters raised by the Roads and Maritime Services of NSW (RMS) and Greater Taree City Council (GTCC).

The scope of the transport assessment has been limited to Possum Brush Road between the Quarry Access Road and the Pacific Highway and the associated intersections.

An appreciation of the existing traffic situation around the Site of the proposed development was gained by examining the existing road network, reviewing recent traffic volumes on the existing road network and liaising with relevant stakeholders. These aspects are discussed in this report. The roads inspected and discussed in this report include Possum Brush Road and the associated intersections with the Quarry Access Road and the Pacific Highway.

A range of mitigation measures have been identified to accommodate the traffic generated by the Proposal. If the mitigation measures proposed are successfully implemented, it is anticipated that the impacts to traffic and other road users would be successfully mitigated.

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1. INTRODUCTION

1.1 BACKGROUND

The Possum Brush Quarry ("the Quarry") first received approval following the grant of development consent by the Greater Taree City Council (GTCC) in May 1986, to permit the establishment of a hard rock quarry and crushing plant. **Figure 1** shows the Possum Brush Quarry is located approximately 2km west of the Pacific Highway at Possum Brush, 4km northwest of Failford and 5km northeast of Nabiac.

In 1997, Pacific Blue Metal Pty Ltd (PBM) submitted an application for development consent to extract material from Area B, an application which was approved by the Minister for Urban Affairs and Planning on 25 May 1998 following a Commission of Inquiry (Development Consent DA 283/97). This development consent has been modified on three occasions since 1998, namely:

i) on 4 February 2003, in response to an application to modify conditions relating to the width of the sealed section of Possum Brush Road and rehabilitation of Possum Brush Road between the Pacific Highway and the Quarry entrance;

ii) on 5 December 2006, in response to an application to modify the conditional requirements relating to road maintenance contributions for Possum Brush Road; and

iii) on 12 December 2012, in response to an application to extend the approved extraction area by 1,120m^2, to enable the recovery of weathered rock and to improve internal access and safety around the on-site weighbridge, workshops and processing area.

When Development Consent DA 283/87 was originally approved, it provided for a two-staged approval with the first stage approved for 21 years (until 2019) and the second stage approved for a further 29 years (until 2048), thereby allowing extraction to proceed for a total period of 50 years.

PBM also operates an on-site asphalt plant within the Possum Brush Quarry, approved separately to quarrying activities by Greater Taree City Council on 25 July 2005. This development consent was modified on 18 November 2010 to allow night-time operations of the asphalt plant, principally to meet the requirements of local infrastructure projects which can only be undertaken at night.

Further to this, PBM received Development Consent DA 769/2009 from Greater Taree City Council on 16 July 2014 for its proposal to import, process and recycle concrete, brick, tile, asphalt and soil.

The Possum Brush Quarry is also operated in accordance with Environment Protection Licence (EPL) 3393 which covers both the extraction and processing activities and asphalt production.

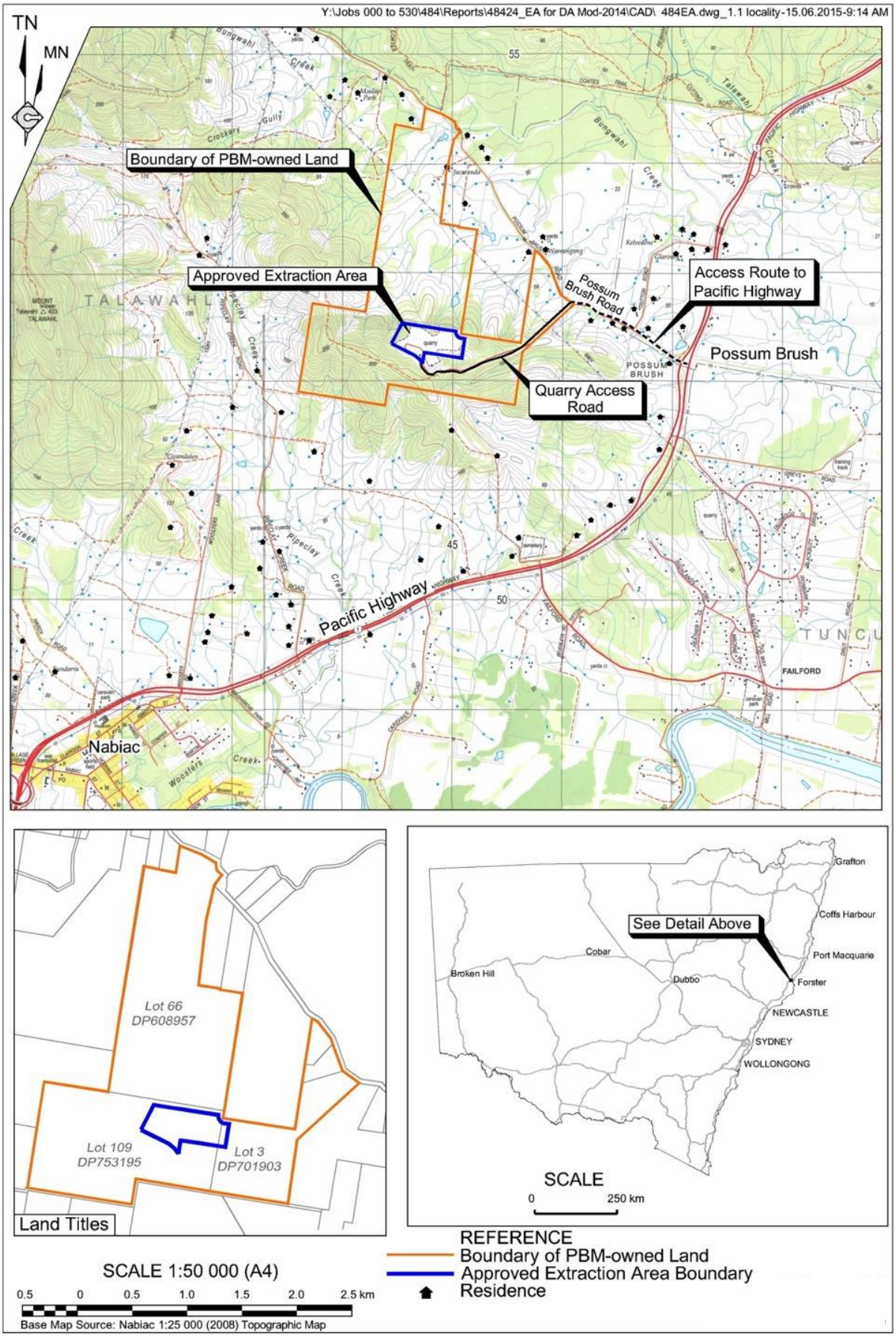


Figure 1 Locality Plan

1.2 SCOPE OF REPORT

This report has been prepared to accompany an *Environmental Assessment* for the ongoing operation of Possum Brush Quarry, prepared by R.W. Corkery & Co. Pty Limited, in accordance with Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), and assesses the traffic-related impacts of the Proposal on the surrounding road network that would be affected throughout the life of the Proposal. This report assesses traffic-related impacts in accordance with the Road and Maritime Services RMS's Guide to Traffic Generating Developments, the Department of Planning's EIS Guidelines for Roads and related Facilities, and the specific matters nominated by the Roads and Maritime Services (RMS).

1.3 CONSULTATION

Consultation with Roads and Maritime Services (RMS) and Greater Taree City Council (GTCC), has been undertaken and is detailed in the corresponding sections below.

Roads and Maritime Services

The Manager Land Use Assessment, Ms Kellee McGilvray from RMS Hunter Region, has been consulted in relation to the Proposal. The following information has been provided by RMS.

- Relevant traffic counts for the Pacific Highway.
- Crash data applicable to this section of the road network.
- A letter outlining the assessment requirements for the Traffic Assessment dated 5 August 2015.
- An email detailing the SIDRA modelling required and associated assumptions dated 15 September 2015.

A summary of RMS's requirements for the traffic assessment are provided below.

- Identification of the relevant vehicular traffic routes and intersections for access to/from the subject site.
- The anticipated additional vehicular traffic generated (both light and heavy vehicles) from the construction and operational stages.
- Consideration of the traffic impacts on the existing intersections and the capacity of the local and classified road network including The Pacific Highway to safely and efficiently cater for the vehicular traffic generated by the proposed development during the construction and operational stages. The study shall also give consideration to the cumulative traffic impacts of other proposed and approved developments in the area.
- Traffic analysis of any major / relevant intersections, using SIDRA or similar traffic model (if required).
- Any other impacts on the regional and state road network including consideration of pedestrian, cyclist and public transport facilities and provision for service vehicles.
- Details of any measures proposed to manage and/or mitigate impacts as a result of the proposal identified in the traffic and transport study.

Greater Taree City Council

Council's Development Planner, Mrs Arnna Fotheringham, was contacted on 2 September 2015, in relation to this assessment. She advised that it is GTCC's preference to comment on the Transport Assessment rather than detail requirements for the assessment.

2. THE SURROUNDING ROAD NETWORK

2.1 INTRODUCTION

Access to the Quarry is provided via the Quarry Access Road that connects the internal road network to the external road network, namely Possum Brush Road and then to the Pacific Highway.

The Quarry Access Road is a private road consisting of two lanes with a 40km/h speed limit. It was designed and constructed by PBM.

The Quarry Access Road intersects with Possum Brush Road with a lockable gate, positioned approximately 50m along the Quarry Access Road. The gate is locked outside approved operational hours. All vehicles accessing the Quarry do so via the Pacific Highway, and therefore no vehicles associated with the Quarry utilise Possum Brush Road to the west of the Quarry Access Road.

Traffic levels associated with product deliveries from the Possum Brush Quarry currently reflect sales of the various products produced at the Quarry. On a busy day, when the asphalt plant, pugmill / wetmix plant, and crushing and screening plant are all operating concurrently, up to 24 loads of products are dispatched hourly and sometimes in excess of 200 loads are dispatched daily. Conversely, on days of limited sales, less than 30 truck loads are dispatched.

Possum Brush Road and the associated intersections described above are described in more detail in Section 2.1 of this report.

2.2 ROADS

2.2.1 Possum Brush Road

Possum Brush Road is considered a minor local road that services the Quarry and other local residences. The road is sealed between the Pacific Highway and the Quarry Access Road and consists of two lanes varying in width between 3.0m and 3.25m and sealed shoulders varying in width between 0.3m to 0.5m. The remaining shoulder/verge width is minimal. The regulatory speed limit is 80km/h.

Generally, the pavement condition is fair to reasonable, however there is evidence of some rutting. Potholes have developed in one isolated area approximately 200m east of the Quarry Access Road.

There are numerous trees in the clear zone[1]. Delineation is provided by faded linemarking (including a BB centreline and edge lines) and guide posts.

There are six property accesses along this section of road, and one intersection with a public road. Some of the property accesses are partly concealed by vegetation.

Tritton Road intersects with Possum Brush Road approximately 550m north-west from the Pacific Highway, and consists of a standard T intersection configuration controlled by give way

[1] The width of the roadside beginning at the edge of the travelled way that is made available for a driver of an errant vehicle to take corrective action in an emergency.

signage. Sight distance is estimated to be 190m to the west and >400m to the east which exceeds the safe intersection sight distance (SISD) for 80km/h of 181m.

2.2.2 Pacific Highway

The existing section of the Pacific Highway to the north and south of Possum Brush Road consists of separate dual lane northbound and southbound carriageways which are estimated to have been constructed in the 1980s. It is understood that the dual carriageway was achieved by constructing a new southbound carriageway whilst retaining the former two way section of the highway to form the northbound lanes (Roadnet, 2006).

Access to and from this section of the Highway is provided by 'at grade' intersections at Failford Road, Bullocky Way, Possum Brush Road and Tritton Road all within a 3.6km section.

A proposed upgrade to the section of the Pacific Highway between Failford Road and Tritton Road (encompassing the Possum Brush Road intersection) has been developed to improve the alignment of the northbound carriageway, reduce accidents, rationalise property access and upgrade the existing intersections (Roadnet 2006).

The upgrade is proposed to occur in two stages and was approved, but not funded, in 2008. A conceptual design for the proposed upgrade is included as **Annexure D** and the Stage 1 interchange at the Failford Road intersection is shown in **Figure 2**. A summary of the Staged works is provided under the respective headings below.

Stage 1

Stage 1 of the upgrade includes the construction of a new section of dual lane road east of the existing southbound lane allowing the existing northbound lane to become a service road. Access to the service road would be provided by a grade separated interchange just west of existing Failford Road intersection. A northbound entry ramp from the service road into the new northbound lane of the Highway (currently the southbound lane) to the north of Possum Brush Road is also proposed.

Vehicles exiting from Possum Brush Road would travel southwards via the service road and the new Failford Road interchange whilst vehicles heading north would proceed along the service road which shall lead into the northbound ramp directly onto the new northbound lanes on the Highway.

Vehicles entering Possum Brush Road would do so via the new Failford Road interchange.

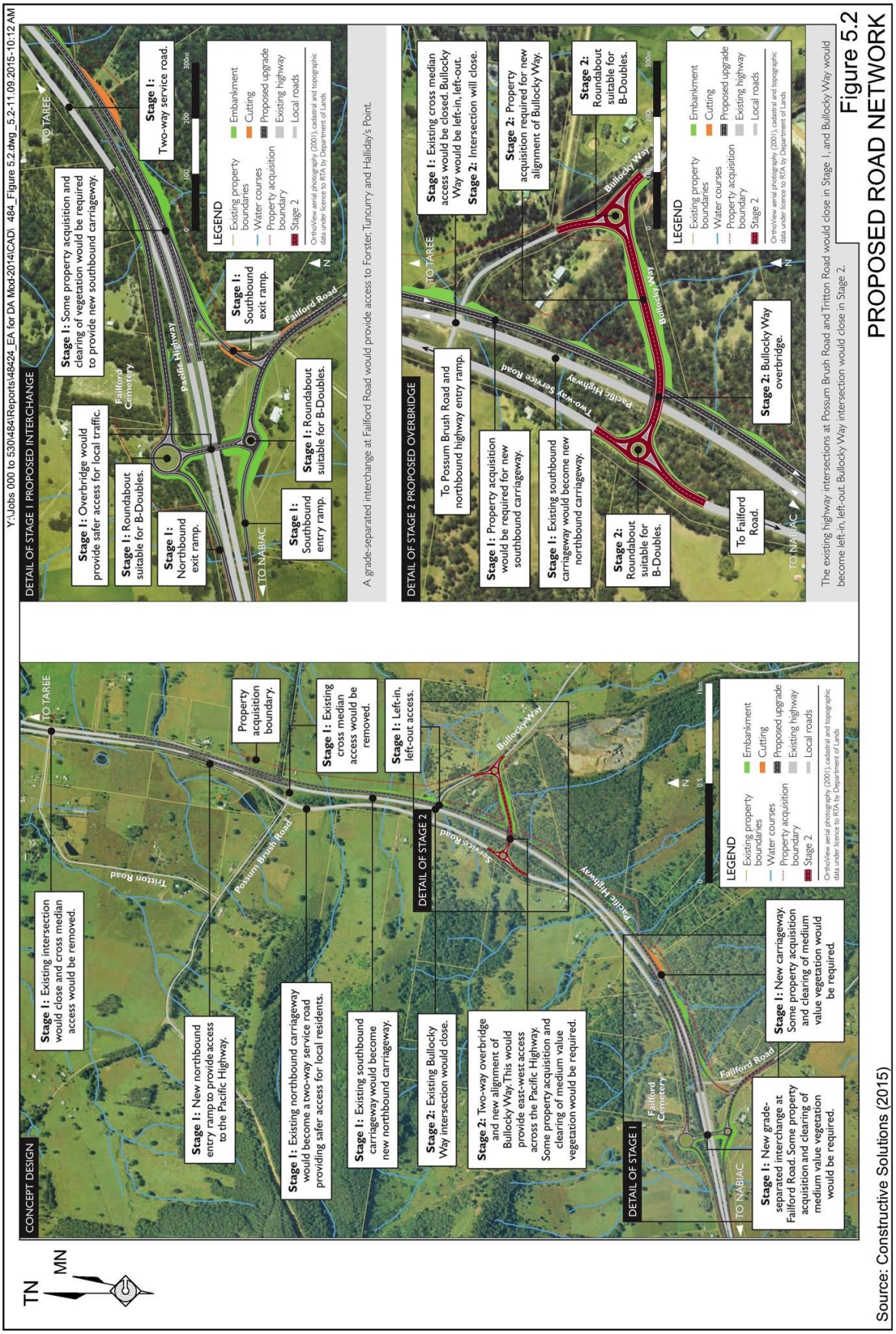
Stage 2

Stage 2 involves the installation of a grade separated east west link near the existing intersection with Bullocky Way. Access to and from the Pacific Highway to Possum Brush Road will remain the same as described for Stage 2.

The proposed timing for both the Stage 1 and Stage 2 works were discussed with the Manager Land Use Assessment for the Hunter Region, Ms Kellee McGilvray. She advised that the project was not currently funded and was unlikely to be considered until all the remaining undivided sections of the Pacific Highway, within NSW, are complete. No specific timeframe was provided however RMS's targeted completion date to provide 'a four lane divided road' from Hexham to Queensland is 2020 (RMS, 2015).

In response to crashes along this section of the Highway, safety improvements between North Arm Cove and Purfleet were undertaken which involved the installation of both median and

roadside wire rope barriers to reduce the number and severity of crashes (RMS, 2013). Subsequent Federal Government (2015) Black Spot Funding has also been made available for the installation of additional wire rope barrier within the vicinity of this location.



2.3 INTERSECTIONS

2.3.1 Quarry Access Road / Possum Brush Road Intersection

The Quarry Access Road forms a T intersection with Possum Brush Road. Vehicles travelling along Possum Brush Road have right of way. The intersection is controlled by duplicated stop signs and a worn hold line (**Plate 1**). The existing turn treatments are basic requiring the turning vehicles to enter or exit directly into or out of the through lanes, however, there is insufficient widening adjacent to the northern side of Possum Brush Road to meet the basic right turn (BAR) requirements in accordance with Austroads (2010). There is approximately 30m of bituminous seal to the west of the Quarry Access Road.

Plate 1: Quarry Access Road Approach to Possum Brush Road

A raised centre median is present in the mouth of the Quarry Access Road approach. No lighting is provided.

Sight distance from the Quarry Access Road along Possum Brush Road is estimated to be 110m to the west and 150m to the east which is less than the SISD for 80km/h of 181m. The sight distance is limited in both directions due to tight radius curves and vegetation as shown in **Plate 2** and **Plate 3.**

Plate 2: Sight Distance looking east along Possum Brush Road

Plate 3: Sight Distance looking west along Possum Brush Road

2.3.2 Possum Brush Road / Pacific Highway Intersection

Possum Brush Road intersects the Pacific Highway in a section of divided carriageway dual lane road. The configuration of the two staged crossing is shown in the Google Earth (2013) imagery in **Figure 3**.

Figure 3: Possum Brush Road / Pacific Highway Intersection Configuration (Google Earth 2013)

As shown in **Figure 3**, Possum Brush Road intersects with the northbound dual lanes initially and connects to the southbound dual lanes via a 50m section of two way road. There is no public road to the east opposite Possum Brush Road, however a rural property access is present. The speed limit for the northbound and southbound lanes are 90km/h and 100km/h respectively.

The following intersection turn treatments are available for northbound traffic:

- An auxiliary left lane (AUL) for vehicles turning left into Possum Brush Road (**Plate 4**).
- An offset right turn lane for vehicles turning right to make a U turn from northbound to southbound (**Plate 5**).

The following intersection turn treatments are available for southbound traffic:

- An offset right turn lane for vehicles turning right into Possum Brush Road or make a U turn from southbound to northbound (**Plate 6**).

The section of two way road between the north and southbound lanes are controlled by a give way sign for eastbound traffic and a stop sign for westbound traffic. There are no acceleration lanes, only short slip lanes that are less than 40m, provided for turning traffic proceeding north or south along the Highway.

Plate 4: AUL Turn Treatment from northbound lanes into Possum Brush Road

Plate 5: Offset Right Turn Lane for Northbound Vehicles

Plate 6: Offset Right Turn Lane for Southbound Vehicles

Plate 7: Connecting Roadway (U Turn Bay)

The associated lengths of the turn treatments and requirements in accordance with Austroads (2010) are shown in **Table 1.**

Table 1
Turn Treatment Lengths

	Actual Length*	Required[#]
Northbound		
Auxiliary Left Lane (AUL)	155m	120m
Offset Right Turn Lane	150m	120m
Southbound		
Offset Right Turn Lane	105m	150m
* Estimated from Google Earth (2013) # Estimated based on turn radius and speed environment from Austroads (2010)		

The available sight distance at this intersection varies for each turn manoeuvre. The estimated available sight distance for each turn manoeuvre is included in **Table 2**.

Table 2
Estimate Sight Distances for Turn Manoeuvres

Turn Manoeuvre	Estimated Sight Distance	Speed Limit	SISD[2]
Left turn from Possum Brush Road into northbound lanes	205 to 215m	90km/h	214m
Straight from Possum Brush Road through U turn bay to southbound lanes	205 to 215m	90km/h	214m
Straight from U turn bay across northbound lanes into Possum Brush Road	165 to 175m	90km/h	214m
Right turn from U turn bay into southbound lanes	>300m	100km/h	248m

Sight distance for vehicles crossing the northbound lanes from the U turn bay into Possum Brush Road is limited primarily due to thick vegetation on the inside of the curve and the crest located approximately 150m south of the intersection.

2.4 TRAFFIC VOLUMES

2.4.1 Current and Forecast Traffic Volumes

Traffic volume data for Possum Brush Road was obtained from counts undertaken by GTCC. The counts were undertaken between 11 July 2016 and 19 July 2016 inclusive utilising tube counters. The most recent counts for the relevant locations are shown in **Table 3**. The results of the traffic counting are presented in **Annexure A**.

Table 3 summarises the current and estimated forecast traffic levels for the roads and locations shown. Forecast growth was extrapolated to 2025, in accordance with RMS requirements to provide 10 year traffic growth projections. An average annual growth estimate of 2% per annum has been assumed.

[2] Based on a reaction time of 2 seconds (Austroads 2009)

Table 3
Existing and Forecast (Year 10) Traffic Volumes

		Existing Traffic[#]			Forecast Traffic (2025)		
Road	**Site**	**Light Vehicle (LV)**	**Heavy Vehicle (HV)**	**Total**	**Light Vehicle (LV)**	**Heavy Vehicle (HV)**	**Total**
Possum Brush Road[#]	150m west of Pacific Highway	175	5	180	213	6	219
Pacific Highway (northbound)	Bungwahl Creek Bridge	5,037	1,705	6,742	5,784	1,959	7,744
Pacific Highway (southbound)	Bungwahl Creek Bridge*	5,215	1,345	6,560	5,990	1,545	7,535

Existing traffic for Possum Brush Road is an estimate of background traffic based on quarry activities on the 16 July 2015 (i.e. without any vehicles travelling to and from the quarry)

* Bungwahl Creek Bridge is located 1.3km north of the Tritton Road intersection with the Pacific Highway

2.4.2 Quarry Operational Traffic

Forecast traffic volumes have been calculated for Possum Brush Road and the associated Pacific Highway Intersection. The following assumptions have been made in relation to vehicle movements associated with the proposed Quarry.

1. Maximum peak hour sales would be limited to 36 movements per hour to satisfy the requirements of the Noise Assessment.

2. Average annual sales are limited to 370 000t per annum. Assuming an average payload of 22t, this equates to average daily heavy vehicle (HV) movements of 122.

3. Maximum annual sales are limited to 500 000t per annum. Assuming an average payload of 26t, this equates to average daily HV movements of 140.

4. The maximum 420 daily truck movements could occur on any day throughout the life of the Quarry, irrespective of the total annual sales.

5. Based on an average workforce of 17 and additional site visits of 4 persons per day, light vehicle (LV) movements are estimated to average 42[3] per day.

6. At maximum (daily) production (an additional 23 persons may be employed (totalling 40), incorporating additional site visits of 4 persons per day) LV movements are estimated to be 88 vehicles per day.

7. Background traffic has been estimated by analysing the number of weighbridge receipts, totalling 148 (296 HV movements) and the estimated LV movements of 68 to achieve 3662t of products on the 16 July 2015. This equates to a total of 364, whilst the total vehicle movements from the associated count were 545. Therefore, background traffic is assumed to be approximately 180 vehicles per day (vpd) with approximately 3% HV.

[3] Assuming an occupancy rate of one person per vehicle

8. If background traffic is 175 LV and 5 HV, the average existing daily traffic associated with the Quarry is assumed to be 98 LV and 125 HV.

9. It is assumed that increased sales will be achieved by:

    a. an increase in the number of days nearer to maximum daily levels than current average levels;

    b. an increase in average payload at maximum sales; and

    c. A general increase in average daily sales.

10. That the origin and destination of all vehicles is split evenly to the north and south.

11. All incoming laden product trucks are assumed to be backloaded utilising what would have been an unladen journey.

Expected light and heavy vehicle daily traffic volumes are listed in **Table 4** based on the assumptions outlined above.

Current and forecast combined traffic volumes are shown in **Table 5** and **Table 6** respectively.

Table 4
Forecast Average and Maximum# Quarry-related Daily Traffic Movements

	Average LV	Average HV	Average Total	Maximum LV	Maximum HV	Maximum Total
Possum Brush Road	42	122	164	88	420	508
Pacific Highway (northbound)	21	61	82	44	210	254
Pacific Highway (southbound)	21	61	82	44	210	254
# Maximum traffic movements based on maximum daily production.						

Table 5
Quarry Operation, Current Traffic and Combined Traffic Volumes at Maximum (Daily) Despatch Levels

	Current Traffic#		Additional Quarry Traffic		Combined Traffic		Combined Total
Road	**LV**	**HV**	**LV**	**HV**	**LV**	**HV**	**(LV & HV)**
Possum Brush Road	175	5	88	420	263	425	688
Pacific Highway (northbound)	5736	1896	44	210	5780	2106	7886
Pacific Highway (southbound)	5941	1482	44	210	5985	1692	7677
# Current traffic is an estimate of background traffic without existing quarry traffic.							

Table 6
Quarry Operation, Forecast Traffic (Year 2025) and Combined Traffic Volumes at Maximum (Daily) Despatch Levels

	Forecast Traffic		Additional Quarry Traffic		Combined Traffic		Combined Total
Road	**LV**	**HV**	**LV**	**HV**	**LV**	**HV**	**(LV & HV)**
Possum Brush Road	213	6	88	420	301	426	727
Pacific Highway (northbound)	6992	2312	44	210	7036	2522	9558
Pacific Highway (southbound)	7242	1806	44	210	7286	2016	9302

2.5 ACCIDENT (CRASH) DATA & QUARRY INCIDENT RECORDS

Detailed crash reports were obtained from NSW Transport Centre for Road Safety. The data obtained summarised crashes on the subject roads over the past 5 years. The location and summary of the data is contained in **Figure 4** and **Table 7**. The detailed crash reports are included in **Annexure B**. Crash data has only been incorporated into **Table 7** where it is known to occur on the road network, considered as part of the scope of this report.

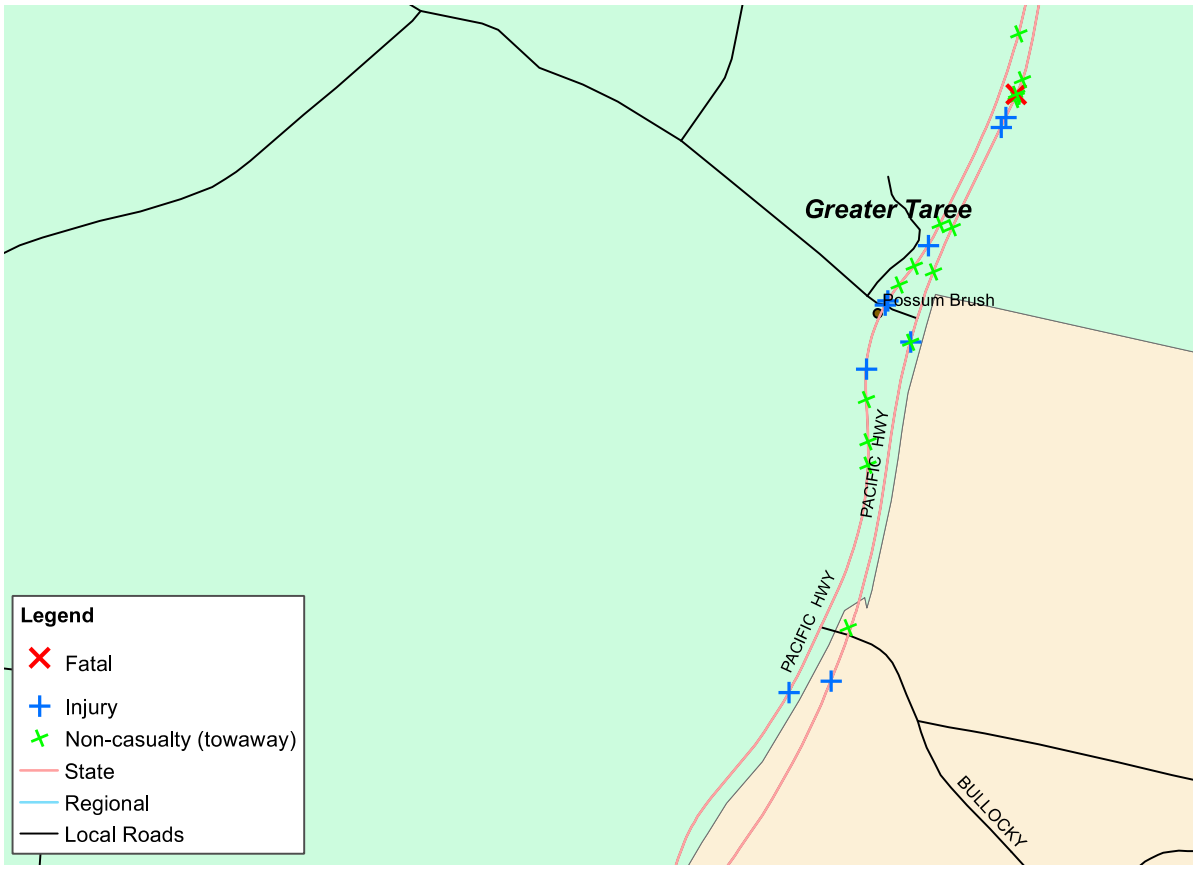


Figure 4 **Crash locations over the past 5 years (source RMS 2015)**

From the available crash data, there appears to have been a cluster of accidents just north of the Possum Brush Road intersection in the northbound lane. There has been one rear end collision between a truck and a car just to the north of Possum Brush Road, in the northbound lanes of the highway, which occurred on 22 August 2015. There have been no other recorded accidents involving two vehicles at this intersection.

Quarry staff have advised that the rear end collision was not identified as an incident associated with quarry traffic. The only traffic related incidents[4] known to be associated with the Quarry are:

- A product truck running off Possum Brush Road 150m east of the Quarry Access Road. The driver advised that the brakes had failed.

- Tailgate of truck came ajar on the Pacific Highway near Taree.

Other complaints have been made by residents travelling along Possum Brush Road about truck drivers failing to obey the stop sign at the end of the Quarry Access Road before turning right onto Possum Brush Road.

[4] As advised by Mr Charlie Kennett

Table 7
Crash Data – Possum Brush Area

Date	Description	Type of Location	Surface Condition	Natural Lighting	No. Killed	No. injured	Direction of Travel	Location of Crash		Identifying Feature (ID)
								Dist (m)	Dir.	
Northbound Lane (at or north of Possum Brush Road Intersection)										
21/11/2011	Off right bend into object	T-junction	Wet	Darkness	-	1	North	0	AT	Possum Brush
11/11/2013	Left off carriageway into object	T-junction	Wet	Darkness	-	1	North	10	North	Possum Brush
04/01/2013	Off right bend into object	Divided road	Dry	Daylight	-	-	North	50	North	Possum Brush
21/06/2010	Off right bend into object	Divided road	Wet	Daylight	-	-	North	100	North	Possum Brush
16/10/2009	Off left bend into object	Divided road	Dry	Daylight	-	1	North	150	North	Possum Brush
22/08/2013	Rear end	Divided road	Dry	Daylight	-	-	North	200	North	Possum Brush
14/08/2011	Off left bend into object	Divided road	Wet	Daylight	-	-	North	500	South	Tritton
Northbound Lane (south of Possum Brush Road Intersection)										
07/03/2011	Off right bend into object	Divided road	Wet	Daylight	-	2	North	140	South	Possum Brush
17/03/2014	Object on road	Divided road	Dry	Darkness	-	-	North	200	South	Possum Brush
22/01/2011	Off left bend into object	Divided road	Dry	Darkness	-	-	North	400	North	Bullocky
Southbound Lane (north of Possum Brush Road Intersection)										
22/03/2014	Off right bend into object	Divided road	Dry	Daylight	-	-	South	0	AT	Number 15046
08/01/2015	Off right bend into object	Divided road	Dry	Darkness	1	-	South	57	North	Number 15046
27/06/2012	Off right bend into object	Divided road	Wet	Daylight	-	-	South	70	North	Number 15046
02/09/2009	Struck animal	Divided road	Dry	Darkness	-	-	South	100	North	Possum Brush
22/01/2012	Right off carriageway into object	Divided road	Wet	Daylight	-	-	South	200	North	Possum Brush
05/05/2012	Off right bend into object	Divided road	Dry	Daylight	-	1	South	430	North	Possum Brush
16/11/2011	Left off carriageway into object	Divided road	Dry	Daylight	-	1	South	450	North	Possum Brush
31/03/2011	Off right bend into object	Divided road	Wet	Daylight	-	-	South	500	North	Possum Brush
23/01/2013	Right off carriageway into object	Divided road	Dry	Darkness	-	-	South	500	North	Possum Brush
Southbound Lane (south of Possum Brush Road Intersection)										
16/05/2010	Object on road	Divided road	Dry	Darkness	-	-	South	50	South	Possum Brush
25/09/2011	Off left bend into object	Divided road	Wet	Daylight	-	2	South	50	South	Possum Brush

The vast majority of the crashes appear to be a result of singular vehicles leaving the roadway, of which the majority have occurred in the northbound lane. There appears to be two clusters; One to the south of Possum Brush Road (after the left hand curve) and the other immediately north (through the reverse 's' bend).

The crash data suggest that all of the accidents involving two or more vehicles have been a result of rear end collisions, therefore were not a result of vehicles turning at the intersection.

Wire rope safety barrier in the vicinity of the intersection was installed in the third quarter of 2013 in response to the accidents along this section of road (RMS 2013) and later in 2015 under the Federal Government's Black Spot Funding.

2.6 SIDRA INTERSECTION ANALYSIS

2.6.1 Intersection performance

In its response to this Proposal, RMS has requested a SIDRA intersection analysis of the Possum Brush Road intersection with the Pacific Highway. The performance of this intersection was modelled using SIDRA, an intersection performance simulation software package. The remaining intersections along the nominated access route were not modelled, as the peak traffic at these intersections is significantly less than their corresponding effective capacity. Therefore any SIDRA modelling would provide no additional value to the assessment.

In accordance with the RMS request, the current and forecast (Year 10) traffic scenarios for an am and pm peak in Pacific Highway and Possum Brush Road traffic have been modelled. Base line models without quarry traffic have been generated for the corresponding peak for comparative purposes. The intersection has been modelled in two sections.

The assumptions used to generate the estimates are included below.

1) Peak Highway traffic was determined from the RMS count from August 2013, which has been extrapolated assuming 2% growth per annum to 2015 and 2025. The peak hour occurred between the hours of 3:00pm and 4:00pm. The corresponding values for the Pacific Highway are:
   a) 493 vph (2015) and 567 vph (2025) with a constant 25.3% HV for the northbound lane.
   b) 511 vph (2015) and 587 vph (2025) with a constant 20.5% HV for the southbound lane.
2) Peak hour traffic on Possum Brush Road has been assumed based on the maximum throughput of the quarry of 24 product trucks[5] in both directions and a further allowance of 10 vehicles in both directions which could be a mixture of either quarry related traffic or other background traffic totalling 68 vph. 2% growth per annum has been applied to the 10 vehicles whilst maximum product truck movements are assumed to remain constant.
3) The northbound dual lanes and the southbound dual lanes were modelled independently in SIDRA.

[5] It is noted that since the SIDRA analysis was conducted, the maximum number of heavy vehicles travelling to and from the Quarry each hour has been reduced to 36, i.e. 18 movements in each direction.

The performance of the intersection is summarised by four performance indicators, namely:

- Level of Service (LoS);
- Degree of Saturation (DoS);
- Maximum queue length (in metres); and
- Average delay per vehicle (in seconds).

A description for each performance indicator is included below.

2.6.2 Level of Service (LoS)

At sign-controlled intersections (Give Way and Stop Signs), the LoS is based on the average delay (seconds per vehicle) for the worst movement. **Table 8** summarises the intersection LoS criteria.

Table 8
Level of Service Criteria

Level of Service	Average Delay (seconds per vehicle)	Give Way and Stop Signs
A	Less than 14	Good operation
B	15 to 28	Acceptable delays & spare capacity
C	29 to 42	Satisfactory but accident study required.
D	43 to 56	Near capacity and accident study required.
E	57 to 70	At capacity, requires other control mode.
F	Over 70	Over capacity
Source: RTA (2002.)		

2.6.3 Degree of Saturation (DoS)

DoS is defined as the ratio of demand flow to capacity and therefore has no unit. As it approaches 1, extensive delays and queues would be expected. For DoS values greater than 1, a small increment in traffic volumes would result in an exponential increase in delays and queue length. For a satisfactory situation, the DoS values should be less than the nominated practical degree of saturation, usually 0.9. The intersection DoS value is based on the movement with the highest ratio.

2.6.4 Average Delay

Delay is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. The delays include queued vehicles decelerating and accelerating to and/or from the stop, as well as delays experienced by all vehicles negotiating the intersection. At sign-controlled intersections, the average delay for the worst movement is usually reported.

2.6.5 Maximum Queue Length

Queue length is the number of vehicles waiting at the hold line and is usually quoted as the 95th percentile back of the queue, which is the value below which 95% of all observed queue lengths fall. The intersection queue length is usually taken from the movement with the longest queue length.

2.6.6 Results

The purpose of the intersection analysis was to determine whether the existing intersection has the capacity to perform satisfactorily at peak times with the additional quarry-related traffic and subsequent growth in background traffic for 2025 (Year 10) along the Pacific Highway.

The performance of the two intersections for the 3pm peak, which represents the worst case scenario, is summarised in **Table 9.** Detailed SIDRA outputs for all scenarios modelled are attached as **Annexure C.**

Table 9
Modelled Traffic Conditions – Peak Operation (2015 & 2025)

Intersection	Scenarios	DoS	Delays (Sec)	LoS (worst)	Queue (m)
Northbound 2015	Possum Brush Road (approach)	0.075	20.2	B	2.6
	Highway (AUL)	0.011	7.9	A	0.0
	Connection Road (approach)	0.045	11.4	A	1.5
Northbound 2025	Possum Brush Road (approach)	0.092	22.7	B	3.1
	Highway (AUL)	0.012	7.9	A	0.0
	Connection Road (approach)	0.052	13.8	A	1.9
Southbound 2015	Highway (Right turn)	0.012	7.6	A	0.0
	Connection Road	0.038	7.5	A	1.3
Southbound 2025	Highway (worst lane)	0.012	7.6	A	0.0
	Connection Road	0.046	8.7	A	1.5

The results indicate that the intersection (modelled separately) will perform satisfactorily as a result of an increase in background traffic volumes. The degree of saturation for all turn movements is relatively low for the associated turn treatments.

The greatest delays are, and would continue to be experienced by vehicles waiting to turn into, or cross, the northbound lanes of the Highway from Possum Brush Road. A level of service of B for the worst turn manoeuvre is considered acceptable.

3. ASSESSMENT AND RECOMMENDATIONS

The following subsections review the impacts resulting from the current operational traffic and anticipated impacts of the forecast traffic on Possum Brush Road and its associated intersection with the Pacific Highway. Discussion relevant to the recommendations for impact mitigation or other controls is also included, where appropriate.

3.1 ROADS

3.1.1 Possum Brush Road

To date, Possum Brush Road has serviced the Quarry with minimal impact on other road users. The general alignment and typical section are considered suitable, with the exception of the narrow shoulder width and lack of suitable verge.

The lack of available shoulder and verge is in part addressed by the reduction in speed limit which should be assessed on a regular basis to ensure it is adequate, particularly if there is an unforeseen increase in background traffic.

Possum Brush Road was substantially rehabilitated in 2006 with expenditure by PBM of approximately $390 000. The pavement is in fair condition, and has some remaining service life, however, it is probable that major pavement rehabilitation will be required prior to the cessation of quarry activities particularly at higher production rates. Timely intervention will be required to ensure significant pavement deformation or failure does not occur.

An existing contribution is in place with GTCC. The rate is currently set at $0.10 per tonne with an incremental increase of $0.05 per tonne every 5 years. This contribution has already accumulated $172,727 since 2008[6]. Council has only requested materials for repairs on two occasions since 2008 reflecting the level of maintenance undertaken and/or required[7]. At the average annual rate of production, the maintenance contribution will be $37,000 per year for 1.3km of road until 2018 after which it would increase in each five year period by $18,500.

Linemarking, signage and guideposts should be maintained as a priority to ensure there is adequate delineation. There are six property accesses between the Quarry Access Road and the Pacific Highway. Maintenance around the private accesses is required to ensure adequate sight distance is maintained.

The increase in production will primarily be due to an in increase in the number of days at or near maximum production and an increase in the average tonnages per product truck.

Possum Brush Road is considered to be generally suitable to accommodate the increase in production which, as noted previously, will not result in a prorata increase in daily traffic volumes.

[6] Based on records presented in the Environmental Management Reports for the Quarry since 2008
[7] Source: Annual Environmental Management Reports, 2007-2008 to 2013-2014.

3.2 INTERSECTIONS

3.2.1 Quarry Access Road / Possum Brush Road Intersection

The general configuration of the Quarry Access Road intersection with Possum Brush Road is considered adequate, however there are associated issues with the available sight distance. Sight distance could be significantly improved by the removal and maintenance of vegetation on the inside of the respective curves in both directions. Where possible it is recommended that the SISD for 80km/h of 181m be achieved in both directions. Alternatively, a reduction in the speed limit may be required.

Given there have been some complaints of truck drivers not giving way to traffic on Possum Brush Road as they depart the Quarry, it is recommended that surveillance of the intersection is undertaken to monitor drivers and take action where necessary to ensure they stop to assess oncoming traffic.

Improved delineation, particularly the reinstatement of linemarking, is required to ensure the existing controls remain effective.

3.2.2 Possum Brush Road / Pacific Highway Intersection

The Possum Brush Road intersection with the Pacific Highway has serviced the needs of the Quarry with no known incidents to date involving heavy or light vehicles associated with the Quarry, however, the there is potential for incidents to occur which are considered to be associated with the northbound Highway alignment and potentially the approach sight distance along this section.

For the turn manoeuvres utilised by haulage vehicles associated with the Quarry, the primary issue is limited available sight distance for vehicles entering Possum Brush Road from the U turn bay. There is the potential for traffic conflict in either of the through lanes, the offset right turn lane or the auxiliary lane. The sight distance is estimated to be between 165 to 175m, to oncoming traffic for this manoeuvre. Available sight distance is limited by vegetation and the associated crest in the northbound lanes. The recommended SISD for 90km/h is 214m.

It is estimated that a further 20 to 30m of sight distance may be achievable, by further removal of vegetation, particularly for trucks as both the drivers eye height, and the height of the object (cab) are significantly higher than the 1.25m assumed in Austroads (2010). Advanced warning could be improved by duplicating the truck turning signs and increasing the sign size.

The available sight distance for vehicles turning from Possum Brush Road into the northbound lanes is also inhibited by the crest in the road to the south and is estimated to be between 205 and 215m, however, this is close to the recommended SISD. Assisting the trucks turning into the northbound lanes and crossing the highway is a slight downhill grade.

Turn manoeuvres, both into and out of the southbound lanes are considered to have adequate sight distance.

The SIDRA analysis undertaken indicates that this intersection has the capacity to accommodate the Quarry movements, up to 48 product truck movements per hour, without having a significant impact on the levels of service at least until Year 10 (2025). PBM's proposed maximum 36 heavy vehicle movements per hour would have a lesser impact upon the intersection performance than that modelled through SIDRA. If the upgrade of the Pacific Highway has not been undertaken prior to 2025, it is recommended that further analysis of the intersection be undertaken.

It is acknowledged that once the Pacific Highway is upgraded in the manner discussed in Section 2.2.2, issues relating to this intersection would diminish substantially.

3.3 DRIVERS AND PRODUCT TRUCKS

The drivers of the vehicles need to be suitably qualified and suitably experienced. Records pertaining to these requirements need to be kept. In addition, a driver's Code of Conduct is recommended that clearly outlines the expectations of the product truck drivers, their responsibility whilst operating the trucks and the consequences of not adhering to a suitable code of conduct.

Similar systems should be required for subcontractors and evidence provided to demonstrate compliance.

A suitable system for identifying the weight of loads and the associated Gross Combined Mass (GCM), Gross Vehicle Mass (GVM) and axle combination limits is also required to ensure the trucks are not overloaded, consequently impacting on the associated road pavements and braking distances. All laden trucks entering of leaving the Quarry need to be covered to prevent loose materials falling from the truck body.

The above measures should be incorporated into a system of auditable procedures, inspections and records which can be used to validate compliance with the Driver's Code of Conduct and inspection regimes.

3.4 SCHOOL BUS SERVICES

There is currently no school bus service along Possum Brush Road, however, pick-up and drop-off occurs at the intersection of Possum Brush Road with the Pacific Highway at approximately 7:45am and 4:00pm. Foster's Coaches is the bus proprietor.

The regular bus driver was not available for comment, however, the bus coordinator, Mr Noel Smith, indicated that the bus pulls up to the north of the intersection. This practice continues although it is noted that Council and PBM have previously constructed a small bus layby adjacent to Possum Brush Road approximately 30m to 40m from the highway. Given the grade of the batter on the northern side of the intersection it is envisaged that the bus must stop in the slip lane across the mouth of the intersection between the hold line and the northbound lanes. This is considered to be an undesirable location as it may impact on access to and from the intersection adjacent to the 90km/h through lanes. This is coupled by the presence of children and parents who are likely to have pulled over adjacent to Possum Brush Road.

It is recommended that a suitable alternative location for the pickup and drop off of school children be utilised that has no adverse impact on the operation of the intersection.

3.5 PEDESTRIAN AND CYCLIST ACTIVITY

There was no pedestrian or cyclist activity witnessed during the site inspection. Given the narrow shoulder width the road is generally considered to be unsuitable for pedestrians and cyclist activity.

If at any time during the remaining life of the Quarry, pedestrian and cyclist activity increases consideration will need to be given to the available shoulder width, speed limit and potentially other related pedestrian facilities.

3.6 CUMULATIVE TRAFFIC IMPACTS

There are no known cumulative traffic impacts that are likely to affect Possum Brush Road. Based on the advice of RMS background traffic growth of 2% has been taken into consideration and is likely to accommodate and cumulative traffic resulting from other developments along the Highway.

When the Pacific Highway Upgrade is completed between Failford Road and Tritton Road, this will have a significant impact on traffic, however, adequate access provisions will be considered in the associated traffic management plans commensurate with the staging of the works and generated traffic.

3.7 MITIGATION SUMMARY

A summary of proposed mitigation measures are provided in **Table 10** for the access route to the Quarry and associated intersections.

Table 10
Summary of Mitigation Measures

Page 1 of 2

Location	Recommendations	Responsibility
General	• A suitable Code of Conduct should be developed for drivers of product trucks including subcontractors where applicable.	PBM
	• All truck loads should continue to be covered to prevent product falling onto the roadway or the creation of excessive dust.	PBM
	• The existing system for identifying the weights of loads and the associated GCM, GVM and axle combination limits should be continued to ensure mass limits are not exceeded	PBM
	• Monitor pedestrian and cyclist activity and ensure the requirements in the Code of Conduct are reinforced.	PBM / GTCC
Possum Brush Road	• Maintain the maintenance contributions for Possum Brush Road with GTCC for the remaining life of the Quarry.	PBM / GTCC
	• Ensure delineation is maintained along Possum Brush Road in liaison with GTCC.	GTCC[#]
	• Remove vegetation around the private accesses to maintain adequate sight distance.	GTCC[#]
Quarry Access Road/ Possum Brush Road Intersection	• Achieve recommended SISD in both directions along Possum Brush Road.	GTCC[#]
	• Include the requirement for all truck drivers to stop within the Quarry Access Road before entering Possum Brush Road within the driver's Code of Conduct and visually monitor driver behaviour and encourage compliance with the intersection controls.	PBM

Table 10 (Cont'd)
Summary of Mitigation Measures

Location	Recommendations	Responsibility
Possum Brush Road / Pacific Highway Intersection*	• Remove additional vegetation in the median adjacent to the northbound lanes to maximise the available sight distance for stationary vehicles exiting the U turn bay.	PBM / RMS
	• Review the truck turning signs on the northbound approach to the intersection in consultation with RMS to ensure relevant standards are being satisfied.	PBM / RMS
	• Liaise regularly with the school bus operator to ensure all relevant information regarding children pick-up and drop-off times and a suitable location for this to occur.	PBM / GTCC / RMS
	• Reassess the intersection performance, and potential mitigation measures, if the Pacific Highway has not been upgraded by 2025	PBM / RMS

* The need for the nominated mitigation measures for this intersection would apply for the period until the section of the Pacific Highway between Failford Road and Tritton Road is upgraded.

GTCC responsibility assumed on the basis that ongoing maintenance arrangements between GTCC and the Quarry are entered into.

4. REFERENCES

Austroads (2010) Guide to Road Design – *Part 4A: Un-signalised and Signalised Intersections*.

Federal Government (2015) Black Spot Programme - Pacific Highway - 600m South of Possum Brush to Tritton Road - POSSUM BRUSH - 047852-13NSW-BS (http://investment.infrastructure.gov.au/projects/ProjectDetails.aspx?Project_id=047852-13NSW-BS)

Roads and Maritime Services (2013) Safety Improvements on the Pacific Highway (*http://www.rms.nsw.gov.au/about/news-events/news/roads-and-maritime/2013/131023-safety-improvements-pac-highway.html*)

Roads and Maritime Services (2015) Pacific Highway Upgrade (http://www.rms.nsw.gov.au/projects/key-build-program/pacific-highway/index.html)

Roads and Traffic Authority (RTA) (2002). Guide to Traffic Generating Developments.

Roadnet (2006) Failford Road to Tritton Road Review of Environmental Factors – Appendix E Traffic Study.

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Annexures

(Total No. of pages including blank pages = 68)

Annexure A Possum Brush Road – Traffic Counts

Annexure B Detailed Crash Reports

Annexure C SIDRA Outputs (CD only)

Annexure D Pacific Highway Upgrade – Failford Road to Tritton Road

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ANNEXURE A

Possum Brush Road – Traffic Counts

(Total number of pages including blank pages = 12)

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Weekly Vehicle Counts

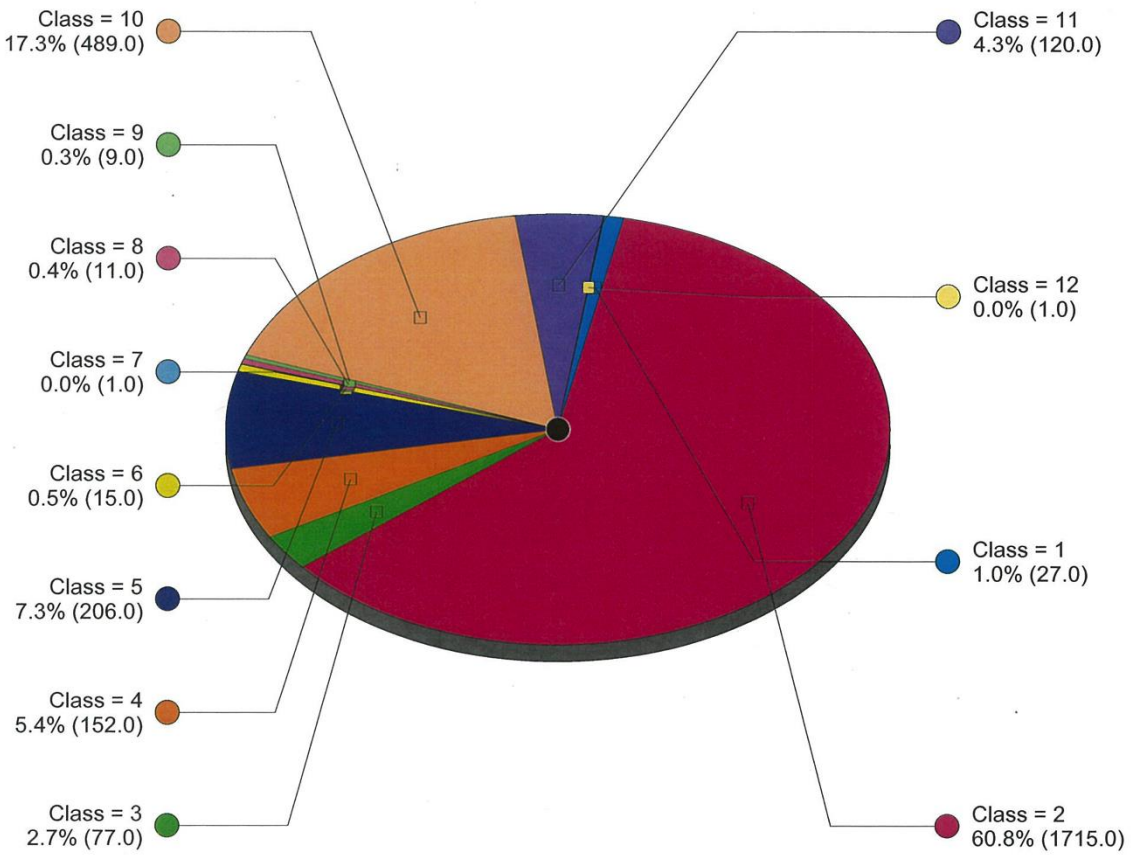
WeeklyVehicle-231
Site: 38330001.0.0W
Description: **Possum Brush Rd - Pacific Highway to PBM quarry entrance**
Filter time: **0:00 Saturday, 11 July 2015 => 0:00 Sunday, 19 July 2015**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Sat 11 Jul	Sun 12 Jul	Mon 13 Jul	Tue 14 Jul	Wed 15 Jul	Thu 16 Jul	Fri 17 Jul	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	5	0	0	0	0	0	0	0.0	0.7
0100-0200	0	0	0	0	0	0	0	0.0	0.0
0200-0300	0	0	0	0	0	0	0	0.0	0.0
0300-0400	1	0	1	0	0	0	0	0.2	0.3
0400-0500	2	3	2	1	1	1	1	1.2	1.6
0500-0600	4	0	16	17	13	14	11	14.2	10.7
0600-0700	7	3	28	25	29	41	27	30.0	22.9
0700-0800	6	3	46	36	**48<**	48	**45<**	**44.6<**	33.1
0800-0900	20	10	37	**44<**	37	45	39	40.4	33.1
0900-1000	12	**23<**	**57<**	31	32	**59<**	37	43.2	**35.9<**
1000-1100	**27<**	17	40	36	45	36	39	39.2	34.3
1100-1200	13	18	49	29	35	37	40	38.0	31.6
1200-1300	25	10	24	22	33	41	**45<**	33.0	28.6
1300-1400	18	18	20	21	**46<**	41	39	33.4	29.0
1400-1500	**25<**	20	18	34	32	50	35	33.8	30.6
1500-1600	21	16	**35<**	34	45	**57<**	28	**39.8<**	**33.7<**
1600-1700	18	**31<**	18	**38<**	29	31	25	28.2	27.1
1700-1800	13	10	33	27	18	19	31	25.6	21.6
1800-1900	4	4	19	19	29	16	13	19.2	14.9
1900-2000	7	7	6	8	12	1	3	6.0	6.3
2000-2100	5	4	4	4	4	7	7	5.2	5.0
2100-2200	0	0	4	3	2	0	5	2.8	2.0
2200-2300	1	0	0	0	0	0	1	0.2	0.3
2300-2400	0	0	0	0	0	1	0	0.2	0.1
Totals									
0700-1900	202	180	396	371	429	480	416	418.4	353.4
0600-2200	221	194	438	411	476	529	458	462.4	389.6
0600-0000	222	194	438	411	476	530	459	462.8	390.0
0000-0000	234	197	457	429	490	545	471	478.4	403.3
AM Peak	1000	0900	0900	0800	0700	0900	0700		
	27	23	57	44	48	59	45		
PM Peak	1400	1600	1500	1600	1300	1500	1200		
	25	31	35	38	46	57	45		

*** - No data.**

Class Bin Chart

ClassBin-232 (Metric) **Site:**38330001.0.0W
Description: Possum Brush Rd - Pacific Highway to PBM quarry entrance
Filter time: 0:00 Saturday, 11 July 2015 => 0:00 Saturday, 18 July 2015
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)
Scheme: Vehicle classification (ARX)
Total=2823



MetroCount Traffic Executive
Default

CustomList-3 -- English (ENA)

Datasets:

Site:	**[38330001] Possum Brush Rd - Pacific Highway to PBM quarry entrance**
Direction:	4 - West bound, A hit first. **Lane:** 0
Survey Duration:	0:00 Saturday, 11 July 2015 => 14:19 Tuesday, 21 July 2015
Zone:	
File:	3833000121Jul2015.EC0 (Plus)
Identifier:	Y970EJDF MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default (v3.21 - 15315)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**0:00 Saturday, 11 July 2015 => 14:00 Tuesday, 21 July 2015**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Factory Default Profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:

0 [Time]	24-hour time (0000 - 2359)
1 [Total]	Number in time step
2 [Cls]	Class totals
3 [Mean]	Average speed
4 [Vpp]	Percentile speed

*** Saturday, 11 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	5	0	3	2	0	0	0	0	0	0	0	0	0	61.9	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	1	0	1	0	0	0	0	0	0	0	0	0	0	74.1	-
0400	2	0	2	0	0	0	0	0	0	0	0	0	0	80.0	-
0500	4	0	4	0	0	0	0	0	0	0	0	0	0	89.2	-
0600	7	1	5	1	0	0	0	0	0	0	0	0	0	82.6	-
0700	6	0	5	0	0	0	0	0	0	0	1	0	0	74.0	-
0800	20	0	16	0	1	0	0	0	2	0	1	0	0	74.3	83.9
0900	12	0	9	1	1	0	0	0	0	0	1	0	0	70.2	79.6
1000	27	0	21	3	0	1	0	0	0	0	2	0	0	73.1	82.1
1100	13	0	5	4	1	0	0	0	1	0	1	1	0	65.2	74.5
1200	25	0	18	4	2	1	0	0	0	0	0	0	0	74.0	82.8
1300	18	2	12	0	1	2	0	0	1	0	0	0	0	72.5	84.6
1400	25	0	16	3	4	2	0	0	0	0	0	0	0	71.9	81.0
1500	21	1	15	4	0	0	0	0	1	0	0	0	0	71.0	81.4
1600	18	0	14	1	2	1	0	0	0	0	0	0	0	70.1	80.6
1700	13	0	10	2	1	0	0	0	0	0	0	0	0	69.5	76.3
1800	4	0	4	0	0	0	0	0	0	0	0	0	0	75.8	-
1900	7	0	7	0	0	0	0	0	0	0	0	0	0	76.4	-
2000	5	0	5	0	0	0	0	0	0	0	0	0	0	67.3	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	1	0	1	0	0	0	0	0	0	0	0	0	0	72.4	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**202**	**3**	**145**	**22**	**13**	**7**	**0**	**0**	**5**	**0**	**6**	**1**	**0**	**71.8**	**82.1**
06-22	**221**	**4**	**162**	**23**	**13**	**7**	**0**	**0**	**5**	**0**	**6**	**1**	**0**	**72.2**	**82.4**
06-00	**222**	**4**	**163**	**23**	**13**	**7**	**0**	**0**	**5**	**0**	**6**	**1**	**0**	**72.2**	**82.4**
00-00	**234**	**4**	**173**	**25**	**13**	**7**	**0**	**0**	**5**	**0**	**6**	**1**	**0**	**72.3**	**82.4**

*** Sunday, 12 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	3	0	3	0	0	0	0	0	0	0	0	0	0	76.4	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	3	0	2	0	0	0	0	0	1	0	0	0	0	81.6	-
0700	3	1	2	0	0	0	0	0	0	0	0	0	0	69.0	-
0800	10	0	10	0	0	0	0	0	0	0	0	0	0	71.8	-
0900	23	1	21	0	0	1	0	0	0	0	0	0	0	73.2	90.7
1000	17	0	14	0	2	1	0	0	0	0	0	0	0	74.4	83.2
1100	18	0	12	4	1	1	0	0	0	0	0	0	0	73.6	80.3
1200	10	0	9	0	1	0	0	0	0	0	0	0	0	67.4	-
1300	18	3	15	0	0	0	0	0	0	0	0	0	0	73.2	79.2
1400	20	0	19	1	0	0	0	0	0	0	0	0	0	70.5	84.6
1500	16	1	10	3	2	0	0	0	0	0	0	0	0	69.1	77.0
1600	31	0	29	1	1	0	0	0	0	0	0	0	0	74.8	85.3
1700	10	2	5	0	3	0	0	0	0	0	0	0	0	70.8	-
1800	4	0	4	0	0	0	0	0	0	0	0	0	0	61.8	-
1900	7	0	4	2	0	0	0	0	1	0	0	0	0	71.0	-
2000	4	0	4	0	0	0	0	0	0	0	0	0	0	78.6	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**180**	**8**	**150**	**9**	**10**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**72.1**	**83.9**
06-22	**194**	**8**	**160**	**11**	**10**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**72.4**	**84.6**
06-00	**194**	**8**	**160**	**11**	**10**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**72.4**	**84.6**
00-00	**197**	**8**	**163**	**11**	**10**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**72.4**	**83.9**

*** Monday, 13 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	1	0	0	0	1	0	0	0	0	0	0	0	0	72.4	-
0400	2	0	2	0	0	0	0	0	0	0	0	0	0	75.0	-
0500	16	0	16	0	0	0	0	0	0	0	0	0	0	76.7	85.3
0600	28	0	19	0	1	3	0	0	0	0	4	1	0	70.1	82.4
0700	46	0	20	0	3	6	0	0	0	0	14	3	0	63.6	72.7
0800	37	1	19	0	2	2	0	0	0	2	9	2	0	68.3	76.7
0900	57	0	36	1	1	3	0	0	0	0	15	1	0	68.5	71.6
1000	40	0	31	0	0	1	0	0	0	0	6	2	0	70.2	72.7
1100	49	0	28	4	2	1	0	0	0	0	11	2	1	67.1	75.6
1200	24	0	13	0	3	0	0	0	0	0	6	2	0	68.4	74.5
1300	20	0	14	0	1	1	0	0	0	1	3	0	0	68.2	79.9
1400	18	0	9	0	1	2	0	0	0	0	6	0	0	63.6	74.9
1500	35	2	26	0	0	0	0	0	0	0	7	0	0	69.0	82.4
1600	18	0	13	1	0	1	0	0	0	0	3	0	0	73.2	78.8
1700	33	0	30	0	1	0	0	0	0	0	2	0	0	76.0	85.3
1800	19	0	14	0	2	0	0	0	0	0	1	2	0	69.7	81.0
1900	6	0	5	0	0	0	0	0	0	0	1	0	0	70.2	-
2000	4	1	2	0	1	0	0	0	0	0	0	0	0	85.3	-
2100	4	0	4	0	0	0	0	0	0	0	0	0	0	72.3	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**396**	**3**	**253**	**6**	**16**	**17**	**0**	**0**	**0**	**3**	**83**	**14**	**1**	**68.6**	**78.1**
06-22	**438**	**4**	**283**	**6**	**18**	**20**	**0**	**0**	**0**	**3**	**88**	**15**	**1**	**68.9**	**79.2**
06-00	**438**	**4**	**283**	**6**	**18**	**20**	**0**	**0**	**0**	**3**	**88**	**15**	**1**	**68.9**	**79.2**
00-00	**457**	**4**	**301**	**6**	**19**	**20**	**0**	**0**	**0**	**3**	**88**	**15**	**1**	**69.2**	**79.2**

*** Tuesday, 14 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	71.5	-
0500	17	0	15	0	1	1	0	0	0	0	0	0	0	78.9	88.9
0600	25	2	13	0	1	3	0	0	0	0	5	1	0	70.2	87.8
0700	36	0	19	1	3	4	0	0	0	0	8	1	0	67.4	76.3
0800	44	0	25	0	4	1	0	0	0	0	12	2	0	70.6	79.6
0900	31	0	13	1	2	4	0	0	0	0	9	2	0	70.6	79.6
1000	36	1	17	3	3	4	0	0	0	0	6	2	0	66.6	74.2
1100	29	0	17	1	0	1	0	0	0	0	8	2	0	69.3	78.1
1200	22	0	10	1	1	2	0	0	0	0	5	3	0	67.9	77.8
1300	21	0	11	3	1	0	0	0	0	0	6	0	0	67.3	74.2
1400	34	0	20	3	3	2	0	0	0	0	6	0	0	63.5	70.6
1500	34	0	19	1	5	4	0	0	0	0	5	0	0	68.6	79.6
1600	38	0	28	0	3	1	0	0	0	0	5	1	0	69.6	83.2
1700	27	1	21	0	0	1	0	0	0	0	2	2	0	68.3	77.4
1800	19	0	18	0	0	0	0	0	0	0	1	0	0	71.2	79.9
1900	8	1	7	0	0	0	0	0	0	0	0	0	0	62.8	-
2000	4	0	2	0	2	0	0	0	0	0	0	0	0	78.7	-
2100	3	0	3	0	0	0	0	0	0	0	0	0	0	59.3	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**371**	**2**	**218**	**14**	**25**	**24**	**0**	**0**	**0**	**0**	**73**	**15**	**0**	**68.4**	**78.1**
06-22	**411**	**5**	**243**	**14**	**28**	**27**	**0**	**0**	**0**	**0**	**78**	**16**	**0**	**68.4**	**78.8**
06-00	**411**	**5**	**243**	**14**	**28**	**27**	**0**	**0**	**0**	**0**	**78**	**16**	**0**	**68.4**	**78.8**
00-00	**429**	**5**	**259**	**14**	**29**	**28**	**0**	**0**	**0**	**0**	**78**	**16**	**0**	**68.8**	**79.6**

*** Wednesday, 15 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	79.5	-
0500	13	0	10	0	2	1	0	0	0	0	0	0	0	76.4	83.2
0600	29	1	14	0	2	3	0	0	0	1	6	2	0	68.7	88.6
0700	48	0	26	0	2	7	0	0	0	0	9	4	0	65.3	73.1
0800	37	0	20	0	4	3	0	0	0	1	7	2	0	69.8	77.8
0900	32	0	18	1	2	3	0	0	0	0	6	2	0	64.9	73.4
1000	45	0	20	0	4	5	0	0	0	0	13	3	0	65.9	71.6
1100	35	0	11	0	5	8	2	0	0	0	7	2	0	66.7	77.8
1200	33	0	12	0	0	4	0	0	0	1	13	3	0	66.2	71.3
1300	46	0	33	2	0	1	0	0	0	0	8	2	0	67.6	73.4
1400	32	0	13	0	2	3	0	0	0	0	12	2	0	63.6	72.0
1500	45	0	20	2	5	2	0	0	0	0	12	4	0	67.8	81.7
1600	29	0	21	0	2	2	0	0	0	0	4	0	0	70.6	81.4
1700	18	0	17	0	1	0	0	0	0	0	0	0	0	74.4	82.1
1800	29	0	25	0	0	0	0	0	0	0	3	1	0	72.3	85.0
1900	12	0	11	0	1	0	0	0	0	0	0	0	0	66.7	72.4
2000	4	0	4	0	0	0	0	0	0	0	0	0	0	69.9	-
2100	2	0	2	0	0	0	0	0	0	0	0	0	0	62.1	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**429**	**0**	**236**	**5**	**27**	**38**	**2**	**0**	**0**	**2**	**94**	**25**	**0**	**67.5**	**77.0**
06-22	**476**	**1**	**267**	**5**	**30**	**41**	**2**	**0**	**0**	**3**	**100**	**27**	**0**	**67.6**	**77.4**
06-00	**476**	**1**	**267**	**5**	**30**	**41**	**2**	**0**	**0**	**3**	**100**	**27**	**0**	**67.6**	**77.4**
00-00	**490**	**1**	**278**	**5**	**32**	**42**	**2**	**0**	**0**	**3**	**100**	**27**	**0**	**67.8**	**77.8**

*** Thursday, 16 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	63.9	-
0500	14	0	13	0	1	0	0	0	0	0	0	0	0	77.8	82.8
0600	41	1	14	0	3	9	1	0	0	0	11	2	0	64.3	79.9
0700	48	0	21	0	6	5	0	0	0	0	14	2	0	65.2	74.2
0800	45	1	17	1	2	8	1	0	1	1	12	1	0	65.6	74.9
0900	59	0	33	0	0	5	0	0	0	0	17	4	0	66.7	75.6
1000	36	1	17	1	1	6	0	0	0	0	8	2	0	65.6	73.1
1100	37	0	14	1	2	4	1	0	0	0	13	2	0	61.9	68.4
1200	41	0	14	1	1	6	2	0	0	0	14	3	0	64.0	71.6
1300	41	1	16	1	2	3	0	0	0	0	14	4	0	66.0	75.2
1400	50	0	27	1	1	7	2	0	0	0	10	2	0	66.0	72.7
1500	57	0	34	1	4	5	1	0	0	0	7	5	0	67.6	77.4
1600	31	0	16	0	1	2	1	0	0	0	9	2	0	68.6	75.6
1700	19	1	15	0	1	0	0	0	0	0	2	0	0	69.6	78.5
1800	16	0	16	0	0	0	0	0	0	0	0	0	0	72.2	89.6
1900	1	0	1	0	0	0	0	0	0	0	0	0	0	63.0	-
2000	7	0	7	0	0	0	0	0	0	0	0	0	0	67.1	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	1	0	1	0	0	0	0	0	0	0	0	0	0	71.3	-
07-19	**480**	**4**	**240**	**7**	**21**	**51**	**8**	**0**	**1**	**1**	**120**	**27**	**0**	**66.2**	**75.6**
06-22	**529**	**5**	**262**	**7**	**24**	**60**	**9**	**0**	**1**	**1**	**131**	**29**	**0**	**66.0**	**75.6**
06-00	**530**	**5**	**263**	**7**	**24**	**60**	**9**	**0**	**1**	**1**	**131**	**29**	**0**	**66.0**	**75.6**
00-00	**545**	**5**	**277**	**7**	**25**	**60**	**9**	**0**	**1**	**1**	**131**	**29**	**0**	**66.3**	**76.0**

*** Friday, 17 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	68.9	-
0500	11	0	11	0	0	0	0	0	0	0	0	0	0	83.0	86.8
0600	27	0	14	0	4	4	1	0	1	1	2	0	0	71.4	78.5
0700	45	0	18	2	2	6	1	0	0	0	12	4	0	68.4	78.8
0800	39	0	15	0	2	9	1	0	0	0	9	3	0	66.9	77.4
0900	37	0	17	0	0	5	1	0	0	0	11	3	0	67.6	76.3
1000	39	0	14	0	1	8	0	0	0	0	12	4	0	67.9	74.9
1100	40	0	19	2	2	6	0	0	0	0	7	4	0	67.6	73.1
1200	45	0	25	1	2	2	0	1	0	1	9	4	0	68.1	79.6
1300	39	0	22	0	2	1	0	0	0	0	12	2	0	66.9	74.9
1400	35	0	21	1	1	4	0	0	0	0	6	2	0	69.1	78.8
1500	28	0	21	1	1	0	0	0	0	0	2	3	0	69.8	79.2
1600	25	0	18	1	0	0	0	0	0	0	4	2	0	69.4	80.3
1700	31	0	21	1	5	1	0	0	2	0	0	1	0	73.8	80.6
1800	13	0	13	0	0	0	0	0	0	0	0	0	0	76.6	83.9
1900	3	0	3	0	0	0	0	0	0	0	0	0	0	66.1	-
2000	7	0	7	0	0	0	0	0	0	0	0	0	0	75.6	-
2100	5	0	3	0	2	0	0	0	0	0	0	0	0	70.7	-
2200	1	0	1	0	0	0	0	0	0	0	0	0	0	71.8	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**416**	**0**	**224**	**9**	**18**	**42**	**3**	**1**	**2**	**1**	**84**	**32**	**0**	**68.8**	**79.2**
06-22	**458**	**0**	**251**	**9**	**24**	**46**	**4**	**1**	**3**	**2**	**86**	**32**	**0**	**69.0**	**79.2**
06-00	**459**	**0**	**252**	**9**	**24**	**46**	**4**	**1**	**3**	**2**	**86**	**32**	**0**	**69.0**	**79.2**
00-00	**471**	**0**	**264**	**9**	**24**	**46**	**4**	**1**	**3**	**2**	**86**	**32**	**0**	**69.4**	**79.9**

*** Saturday, 18 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	1	0	1	0	0	0	0	0	0	0	0	0	0	78.6	-
0100	1	0	1	0	0	0	0	0	0	0	0	0	0	55.6	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	2	0	2	0	0	0	0	0	0	0	0	0	0	72.4	-
0500	6	0	6	0	0	0	0	0	0	0	0	0	0	84.9	-
0600	8	0	5	0	3	0	0	0	0	0	0	0	0	74.0	-
0700	14	0	9	1	2	2	0	0	0	0	0	0	0	73.7	77.0
0800	11	1	6	0	0	4	0	0	0	0	0	0	0	75.5	86.0
0900	16	0	13	0	0	3	0	0	0	0	0	0	0	72.5	79.2
1000	18	0	17	0	0	0	0	0	0	0	1	0	0	73.3	83.9
1100	32	1	24	2	3	0	0	0	0	0	2	0	0	71.5	80.3
1200	16	0	16	0	0	0	0	0	0	0	0	0	0	72.6	89.6
1300	31	0	27	1	0	1	0	0	1	1	0	0	0	73.1	83.2
1400	22	0	22	0	0	0	0	0	0	0	0	0	0	75.3	84.6
1500	9	0	5	0	4	0	0	0	0	0	0	0	0	76.7	-
1600	20	0	18	0	2	0	0	0	0	0	0	0	0	74.1	78.8
1700	10	0	9	0	1	0	0	0	0	0	0	0	0	70.6	-
1800	8	0	7	0	1	0	0	0	0	0	0	0	0	68.7	-
1900	3	0	3	0	0	0	0	0	0	0	0	0	0	65.2	-
2000	1	0	1	0	0	0	0	0	0	0	0	0	0	81.0	-
2100	2	0	2	0	0	0	0	0	0	0	0	0	0	67.6	-
2200	4	0	4	0	0	0	0	0	0	0	0	0	0	62.9	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**207**	**2**	**173**	**4**	**13**	**10**	**0**	**0**	**1**	**1**	**3**	**0**	**0**	**73.1**	**83.9**
06-22	**221**	**2**	**184**	**4**	**16**	**10**	**0**	**0**	**1**	**1**	**3**	**0**	**0**	**73.1**	**83.5**
06-00	**225**	**2**	**188**	**4**	**16**	**10**	**0**	**0**	**1**	**1**	**3**	**0**	**0**	**72.9**	**83.2**
00-00	**235**	**2**	**198**	**4**	**16**	**10**	**0**	**0**	**1**	**1**	**3**	**0**	**0**	**73.1**	**83.5**

*** Sunday, 19 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	1	0	0	0	0	0	0	0	1	0	0	0	0	59.5	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	92.3	-
0500	1	0	1	0	0	0	0	0	0	0	0	0	0	86.5	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	6	0	3	3	0	0	0	0	0	0	0	0	0	74.7	-
0800	6	0	6	0	0	0	0	0	0	0	0	0	0	75.6	-
0900	17	1	13	2	1	0	0	0	0	0	0	0	0	75.2	82.1
1000	16	1	12	0	3	0	0	0	0	0	0	0	0	74.3	79.9
1100	19	1	15	3	0	0	0	0	0	0	0	0	0	70.0	85.3
1200	16	3	11	2	0	0	0	0	0	0	0	0	0	71.1	80.6
1300	15	2	8	5	0	0	0	0	0	0	0	0	0	74.9	80.6
1400	19	0	19	0	0	0	0	0	0	0	0	0	0	73.1	82.8
1500	26	1	25	0	0	0	0	0	0	0	0	0	0	77.1	84.6
1600	14	0	12	0	1	0	0	0	1	0	0	0	0	72.8	80.3
1700	9	1	8	0	0	0	0	0	0	0	0	0	0	64.3	-
1800	7	0	6	0	1	0	0	0	0	0	0	0	0	70.8	-
1900	3	0	3	0	0	0	0	0	0	0	0	0	0	66.6	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	2	0	2	0	0	0	0	0	0	0	0	0	0	68.6	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**170**	**10**	**138**	**15**	**6**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**73.2**	**82.8**
06-22	**175**	**10**	**143**	**15**	**6**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**73.1**	**82.4**
06-00	**175**	**10**	**143**	**15**	**6**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**73.1**	**82.4**
00-00	**178**	**10**	**145**	**15**	**6**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**73.2**	**82.8**

*** Monday, 20 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	1	0	1	0	0	0	0	0	0	0	0	0	0	68.0	-
0500	22	0	20	1	1	0	0	0	0	0	0	0	0	79.4	92.2
0600	21	0	16	1	0	1	0	0	0	1	2	0	0	66.3	78.8
0700	26	1	13	0	2	0	0	0	0	0	8	2	0	66.8	74.9
0800	23	0	13	0	3	0	0	0	0	0	7	0	0	69.4	83.5
0900	20	0	13	1	2	0	0	0	0	2	1	1	0	72.1	79.9
1000	17	0	10	0	2	0	0	0	0	0	4	1	0	72.5	78.1
1100	14	0	6	3	2	0	0	0	0	0	3	0	0	70.2	78.8
1200	24	1	13	0	2	0	0	0	0	1	6	1	0	68.9	76.0
1300	13	1	6	0	1	1	0	0	0	0	3	1	0	70.9	80.3
1400	24	0	17	1	0	1	0	0	0	0	5	0	0	69.5	73.8
1500	37	0	28	1	2	0	0	0	0	0	5	1	0	69.9	79.2
1600	23	0	12	1	2	1	0	0	0	0	5	2	0	69.4	83.5
1700	29	1	20	0	2	0	0	0	0	0	4	2	0	76.0	88.6
1800	13	0	13	0	0	0	0	0	0	0	0	0	0	75.5	79.9
1900	5	0	4	0	1	0	0	0	0	0	0	0	0	76.1	-
2000	1	0	1	0	0	0	0	0	0	0	0	0	0	76.4	-
2100	2	0	2	0	0	0	0	0	0	0	0	0	0	65.2	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	**263**	**4**	**164**	**7**	**20**	**3**	**0**	**0**	**0**	**3**	**51**	**11**	**0**	**70.7**	**81.7**
06-22	**292**	**4**	**187**	**8**	**21**	**4**	**0**	**0**	**0**	**4**	**53**	**11**	**0**	**70.5**	**81.0**
06-00	**292**	**4**	**187**	**8**	**21**	**4**	**0**	**0**	**0**	**4**	**53**	**11**	**0**	**70.5**	**81.0**
00-00	**315**	**4**	**208**	**9**	**22**	**4**	**0**	**0**	**0**	**4**	**53**	**11**	**0**	**71.1**	**82.4**

*** Tuesday, 21 July 2015**

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp 85
0000	1	0	1	0	0	0	0	0	0	0	0	0	0	78.1	-
0100	1	0	1	0	0	0	0	0	0	0	0	0	0	77.2	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	14	0	13	0	1	0	0	0	0	0	0	0	0	80.8	88.6
0600	22	1	13	0	3	2	0	0	0	0	2	1	0	75.3	92.2
0700	24	1	13	0	4	1	0	0	0	0	5	0	0	67.3	79.2
0800	27	1	17	0	4	4	0	0	0	0	1	0	0	71.8	79.2
0900	26	0	13	0	2	2	0	0	0	0	8	1	0	69.6	78.5
1000	15	1	13	0	0	0	0	0	0	1	0	0	0	72.1	82.8
07-19	**92**	**3**	**56**	**0**	**10**	**7**	**0**	**0**	**0**	**1**	**14**	**1**	**0**	**70.1**	**79.6**
06-22	**114**	**4**	**69**	**0**	**13**	**9**	**0**	**0**	**0**	**1**	**16**	**2**	**0**	**71.1**	**82.8**
06-00	**114**	**4**	**69**	**0**	**13**	**9**	**0**	**0**	**0**	**1**	**16**	**2**	**0**	**71.1**	**82.8**
00-00	**130**	**4**	**84**	**0**	**14**	**9**	**0**	**0**	**0**	**1**	**16**	**2**	**0**	**72.2**	**83.2**

In profile: Vehicles = 3681 / 3681 (100.00%)

From: **Hunter Traffic Data** Hunter.Traffic.Data@rms.nsw.gov.au
Subject: RE: Possum Brush Quarry - Transport and Traffic Assessment
Date: 23 July 2015 11:23 am
To: Ben Rossiter ben@constructivesolutions.com.au

HT

Hi Ben,

We have recent counts from August 2013 for the Pacific Hwy at the Bungwahl Creek Bridge.

Typical daily profile during the survey week:

Northbound

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
93	78	66	50	55	103	186	327	453	413	432	434	440	449	478	474	438	386	290	218	193	177	137	110

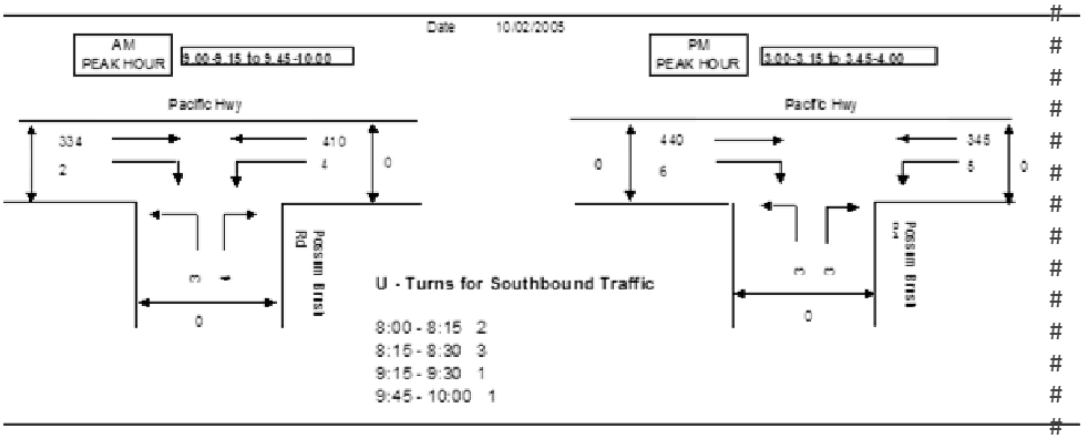
Southbound

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
57	73	67	72	86	122	203	271	365	422	464	480	470	488	466	491	464	398	233	177	150	122	94	70

Northbound
On weekdays, the HV% was 25.3% and on weekends it was 12.4%.

Southbound
On weekdays, the HV% was 20.5% and on weekends it was 12.7%.

Turning movement counts were carried out most recently in 2005. If more recent data is required there are a number of private contractors with this capability.



Thanks,

Karl Wetzler
Network Optimisation Analyst - Traffic
Network Optimisation Planning - Hunter

ANNEXURE B

Detailed Crash Reports

(Total number of pages including blank pages = 8)

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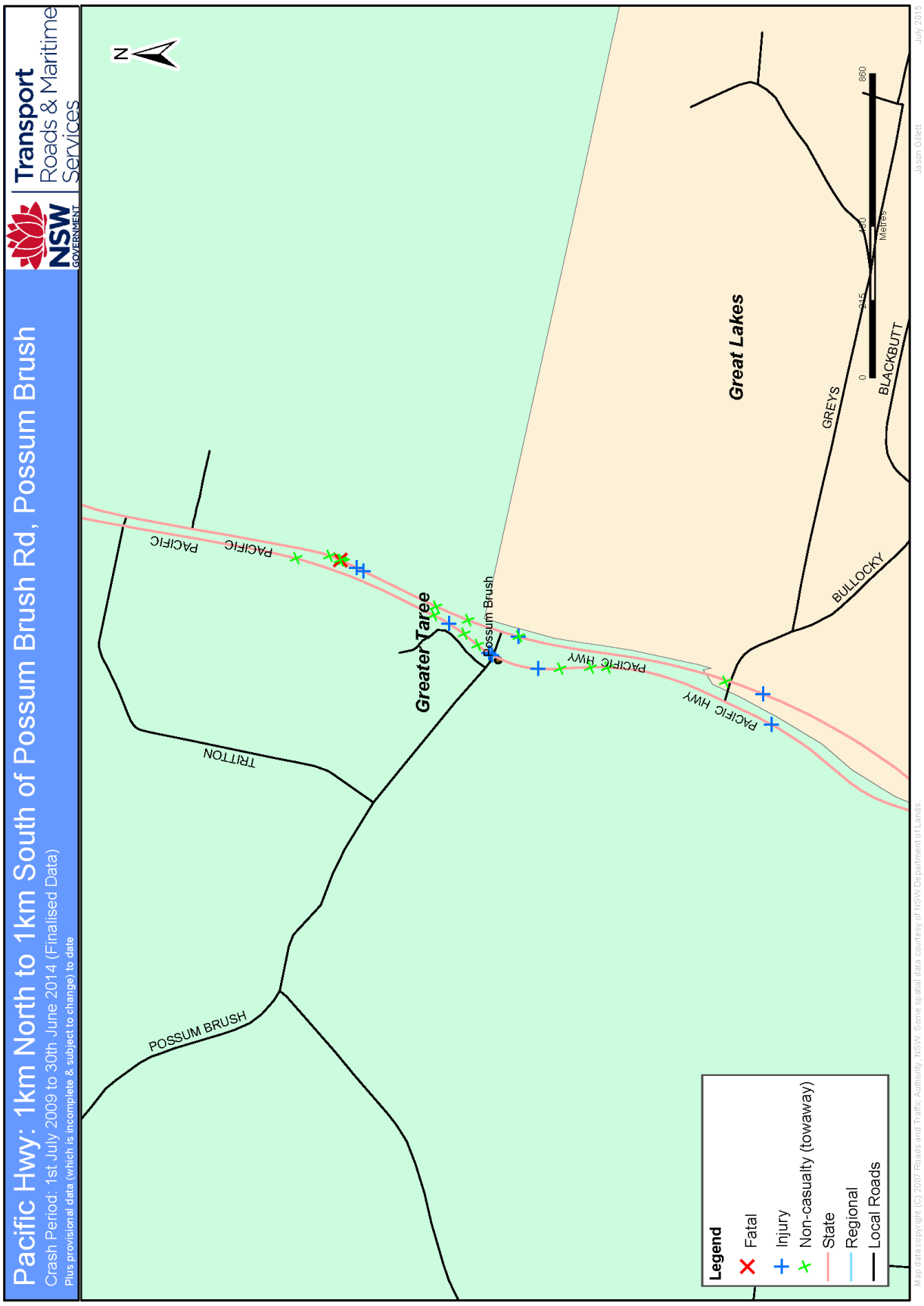
Pacific Hwy: 1km North to 1km South of Possum Brush Rd, Possum Brush
Crash Period: 1st July 2009 to 30th June 2014 (Finalised Data)
Plus provisional data (which is incomplete & subject to change) to date
Transport
Roads & Maritime
Services
NSW GOVERNMENT
N
Great Lakes
Greater Taree
Possum Brush
PACIFIC HWY
PACIFIC
TRITTON
POSSUM BRUSH
BULLOCKY
GREYS
BLACKBUTT
0
215
430
860
Metres
Legend
Fatal
Injury
Non-casualty (towaway)
State
Regional
Local Roads
Jason Gillett
July 2015
Map data copyright (C) 2007 Roads and Traffic Authority, NSW. Some spatial data courtesy of NSW Department of Lands

Summary Crash Report

Transport for NSW — Centre for Road Safety

# Crash Type		
Car Crash	15	60.0%
Light Truck Crash	7	28.0%
Rigid Truck Crash	1	4.0%
Articulated Truck Crash	5	20.0%
'Heavy Truck Crash	(6)	(24.0%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(6)	(24.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	3	12.0%
Non intersection	22	88.0%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	22	88.0%
Multi Vehicle	3	12.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	25	100.0%
Other Classified Road	0	0.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	12	48.0%
Fatigue	5	20.0%

Weather		
Fine	14	56.0%
Rain	10	40.0%
Overcast	1	4.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	11	44.0%
Dry	14	56.0%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	16	64.0%
Dusk	0	0.0%
Darkness	9	36.0%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	2	8.0%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	1	4.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	4	16.0%
Out of control on straight	0	0.0%
Off road, on curve	1	4.0%
Off road on curve, hit object	14	56.0%
Out of control on curve	0	0.0%
Other crash type	3	12.0%

Speed Limit				
40 km/h or less	0	0.0%	80 km/h zone	1	4.0%
50 km/h zone	0	0.0%	90 km/h zone	7	28.0%
60 km/h zone	1	4.0%	100 km/h zone	8	32.0%
70 km/h zone	0	0.0%	110 km/h zone	8	32.0%

CRASHES	25	
Fatal crash	1	4.0%
Injury crash	9	36.0%
Non-casualty crash	15	60.0%

Self Reported Crash	1	4%

Time Group		% of Day	
00:01 - 02:59	3	12.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	2	8.0%	4.2%
08:00 - 08:59	1	4.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	1	4.0%	4.2%
11:00 - 11:59	3	12.0%	4.2%
12:00 - 12:59	1	4.0%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	3	12.0%	4.2%
15:00 - 15:59	3	12.0%	4.2%
16:00 - 16:59	2	8.0%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	1	4.0%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	2	8.0%	8.3%
22:00 - 24:00	3	12.0%	8.3%

Street Lighting Off/Nil			% of Dark
7	of	9 in Dark	77.8%

CASUALTIES	12	
Killed	1	8.3%
Injured	11	91.7%
^ Unrestrained	1	8.3%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
2	2015	1
2	2014	0
4	2013	1
4	2012	2
7	2011	6
3	2010	1
3	2009	1

McLean Periods			% Week
A	1	4.0%	17.9%
B	2	8.0%	7.1%
C	4	16.0%	17.9%
D	1	4.0%	3.5%
E	3	12.0%	3.6%
F	3	12.0%	10.7%
G	2	8.0%	7.1%
H	2	8.0%	7.1%
I	5	20.0%	12.5%
J	2	8.0%	10.7%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	4	16.0%

Day of the Week								
Monday	6	24.0%	Thursday	3	12.0%	Sunday	5	20.0%
Tuesday	1	4.0%	Friday	2	8.0%	WEEKDAY	16	64.0%
Wednesday	4	16.0%	Saturday	4	16.0%	WEEKEND	9	36.0%

# Holiday Periods								
New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	0	0.0%
Aust. Day	0	0.0%	Labour Day	1	4.0%	June/July SH	0	0.0%
Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	3	12.0%
Anzac Day	0	0.0%	January SH	6	24.0%	December SH	0	0.0%

Crashid dataset Pacific Highway: 1km North to 1km South of Possum Brush Road, Possum Brush - 1/7/2009 to 2015*

Note: Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. For further information refer to Data Manual or report provider.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Constructive Solutions

Detailed Crash Report - sorted

Crash No. / Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S	Factors F
Natural Lighting																					
Hunter Region				**Greater Taree LGA**			**Failford**							**Pacific Hwy**							
679239 P	11/08/2009	Tue	21:30	350 m N	BULLOCKY WAY	DIV	CRV	Raining	Wet	90	1	CAR	M24	N in PACIFIC HWY	90	Proceeding in lane	N	0	0	S	
E38274145					Darkness	DCA : 804	R	Off left bend into obj				Tree/bush									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
682981 P	02/09/2009	Wed	22:45	100 m N	POSSUM BRUSH RD	DIV	CRV	Fine	Dry	100	1	SEM	M56	S in PACIFIC HWY	100	Proceeding in lane	N	0	0		
E40234385					Darkness	DCA : 609		On path - Hit animal				Straying stock									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
686757 P	16/10/2009	Fri	14:25	150 m N	POSSUM BRUSH RD	DIV	CRV	Fine	Dry	110	1	CAR	M89	N in PACIFIC HWY	80	Proceeding in lane	I	0	1	S	
E38662932					Daylight	DCA : 804	L	Off left bend into obj				Fence (prior to 2014)									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
711591 P	16/05/2010	Sun	18:30	50 m S	POSSUM BRUSH RD	DIV	STR	Fine	Dry	100	1	CAR	M39	S in PACIFIC HWY	100	Proceeding in lane	N	0	0		
E43296681					Darkness	DCA : 607		On path - Hit temp object				Other non fixed object									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
714705 P	21/06/2010	Mon	15:30	100 m N	POSSUM BRUSH RD	DIV	CRV	Raining	Wet	90	1	CAR	M28	N in PACIFIC HWY	90	Proceeding in lane	N	0	0	S	
E41551462					Daylight	DCA : 801	R	Off cway right bend													
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
726897 P	03/10/2010	Sun	12:05	150 m S	BULLOCKY WAY	DIV	CRV	Overcast	Wet	90	1	TRK	F40	N in PACIFIC HWY	90	Proceeding in lane	I	0	1	S	
E42504079					Daylight	DCA : 804	L	Off left bend into obj				Tree/bush									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
739689 P	22/01/2011	Sat	22:30	400 m N	BULLOCKY WAY	DIV	CRV	Fine	Dry	100	1	BDBL	M55	N in PACIFIC HWY	100	Proceeding in lane	N	0	0		
E148075196					Darkness	DCA : 804	L	Off left bend into obj				Signpost									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
746855 P	07/03/2011	Mon	11:20	140 m S	POSSUM BRUSH RD	DIV	CRV	Raining	Wet	90	1	4WD	M51	N in PACIFIC HWY	90	Proceeding in lane	I	0	2	S	
E43674372					Daylight	DCA : 803	R	Off right bend into obj				Embankment									
Hunter Region				**Greater Taree LGA**			**Possum Brush**							**Pacific Hwy**							
747809 P	31/03/2011	Thu	16:30	500 m N	POSSUM BRUSH RD	DIV	CRV	Raining	Wet	110	1	LOR	F60	S in PACIFIC HWY	90	Proceeding in lane	N	0	0	S	
E46628486					Daylight	DCA : 803	R	Off right bend into obj				Tree/bush									

Detailed Crash Report - sorted

Crash No. / Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S	Factors F
Natural Lighting																					
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
766567 P	14/08/2011	Sun	14:30	500 m S	TRITON RD	DIV	CRV	Raining	Wet	90	1	UTE	M U	N in PACIFIC HWY	90	Proceeding in lane	N	0	0	S	
E44905409				Daylight		DCA : 804	L	Off left bend into obj				Embankment									
Hunter Region			**Great Lakes LGA**			**Possum Brush**								**Pacific Hwy**							
768517 P	25/09/2011	Sun	11:25	50 m S	POSSUM BRUSH RD	DIV	CRV	Raining	Wet	100	1	TRK	F62	S in PACIFIC HWY	95	Proceeding in lane	I	0	2	S	
E45635432				Daylight		DCA : 804	R	Off left bend into obj				Fence (prior to 2014)									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
774357 P	16/11/2011	Wed	07:30	450 m N	POSSUM BRUSH RD	DIV	STR	Fine	Dry	100	1	VAN	M20	S in PACIFIC HWY	100	Proceeding in lane	I	0	1		F
E46728769				Daylight		DCA : 703		Left off cway into object				Drain/culvert									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
796237 P	21/11/2011	Mon	00:10	at	POSSUM BRUSH RD	TJN	CRV	Raining	Wet	90	1	CAR	F34	N in PACIFIC HWY	90	Proceeding in lane	I	0	1	S	
E45981035				Darkness		DCA : 803	R	Off right bend into obj				Signpost									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
780610 P	09/01/2012	Mon	15:45	100 m S	BULLOCKY WAY	DIV	CRV	Fine	Dry	100	2	SEM	M55	S in PACIFIC HWY	100	Proceeding in lane	I	0	1		
E90166501				Daylight		DCA : 301		Same - Rear end				VAN	M53	S in PACIFIC HWY	70	Proceeding in lane					
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
781823 P	22/01/2012	Sun	07:30	200 m N	POSSUM BRUSH RD	DIV	STR	Raining	Wet	110	1	TRK	M27	S in PACIFIC HWY	100	Proceeding in lane	N	0	0		
E194824594				Daylight		DCA : 704		Right off cway into obj				Tree/bush									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
794302 P	05/05/2012	Sat	10:50	430 m N	POSSUM BRUSH RD	DIV	CRV	Fine	Dry	110	1	TRK	M27	S in PACIFIC HWY	100	Proceeding in lane	I	0	1		F
E47638132				Daylight		DCA : 803	L	Off right bend into obj				Other fixed object									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
801664 P	27/06/2012	Wed	11:25	70 m N	NUMBER 15046 HN	DIV	CRV	Raining	Wet	110	1	WAG	M25	S in PACIFIC HWY	100	Proceeding in lane	N	0	0	S	
E48383345				Daylight		DCA : 803	R	Off right bend into obj				Tree/bush									
Hunter Region			**Greater Taree LGA**			**Possum Brush**								**Pacific Hwy**							
822699 P	04/01/2013	Fri	14:30	50 m N	POSSUM BRUSH RD	DIV	CRV	Fine	Dry	100	1	4WD	F73	N in PACIFIC HWY	100	Proceeding in lane	N	0	0		
E49941114				Daylight		DCA : 803	L	Off right bend into obj				Fence (prior to 2014)									

Detailed Crash Report - sorted

Crash No. / Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S	Factors F
Natural Lighting																					
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
824737 P	23/01/2013	Wed	00:30	500 m N	POSSUM RBUSH RD	DIV	STR	Fine	Dry	100	1	SEM	M45	S in PACIFIC HWY	Unk Proceeding in lane		N	0	0		F
E50303972					Darkness	DCA : 704	Right off cway into obj					Tree/bush									
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1028474 P	22/08/2013	Thu	16:45	200 m N	POSSUM BRUSH RD	DIV	STR	Fine	Dry	110	2	CAR	F21	N in PACIFIC HWY	100 Proceeding in lane		N	0	0	S	
E52245275					Daylight	DCA : 301	Same - Rear end					TRK	M35	N in PACIFIC HWY	90 Proceeding in lane						
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1008750 P	11/11/2013	Mon	00:30	10 m N	POSSUM BRUSH RD	TJN	STR	Raining	Wet	80	1	CAR	M18	N in PACIFIC HWY	50 Proceeding in lane		I	0	1		
E53517428					Darkness	DCA : 703	Left off cway into object					Tree/bush									
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1017192 P	17/03/2014	Mon	20:15	200 m S	POSSUM BRUSH RD	DIV	CRV	Fine	Dry	90	1	CAR	M24	N in PACIFIC HWY	95 Proceeding in lane		N	0	0	S	
E54402046					Darkness	DCA : 607	On path - Hit temp object					Other non fixed object									
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1016633 P	22/03/2014	Sat	08:30	at	NUMBER 15046 HN	DIV	CRV	Fine	Dry	110	1	SEM	M69	S in PACIFIC HWY	100 Proceeding in lane		N	0	0		F
E54202945					Daylight	DCA : 803 L	Off right bend into obj					Fence									
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1050251 P	08/01/2015	Thu	22:10	57 m N	NUMBER 15046 HN	DIV	CRV	Fine	Dry	110	1	TRK	M49	S in PACIFIC HWY	110 Proceeding in lane		F	1	0		F
E57649465					Darkness	DCA : 803 L	Off right bend into obj					Fence									
Hunter Region				**Greater Taree LGA**				**Possum Brush**						**Pacific Hwy**							
1062639 S	07/03/2015	Sat	15:30	at	BULLOCKY WAY	TJN	CRV	Fine	Dry	60	2	CAR	F69	N in PACIFIC HWY	Unk Other forward		N	0	0		
E57771528					Daylight	DCA : 300	Same - other					TRK	F47	N in PACIFIC HWY	Unk Other forward						

Report Totals: Total Crashes: 25 Fatal Crashes: 1 Injury Crashes: 9 Killed: 1 Injured: 11

Crashid dataset Pacific Highway: 1km North to 1km South of Possum Brush Road, Possum Brush - 1/7/2009 to 2015*

Note: Ordered by: Crash Date. Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. For further information refer to Data Manual or report provider.

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ANNEXURE C

SIDRA Outputs

(Total number of pages including blank pages = 42)

(This Annexure is only available on the Project CD)

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OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2015 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2015 3pm Peak

Stop (Two-Way)

Volume Display Method: Total and %

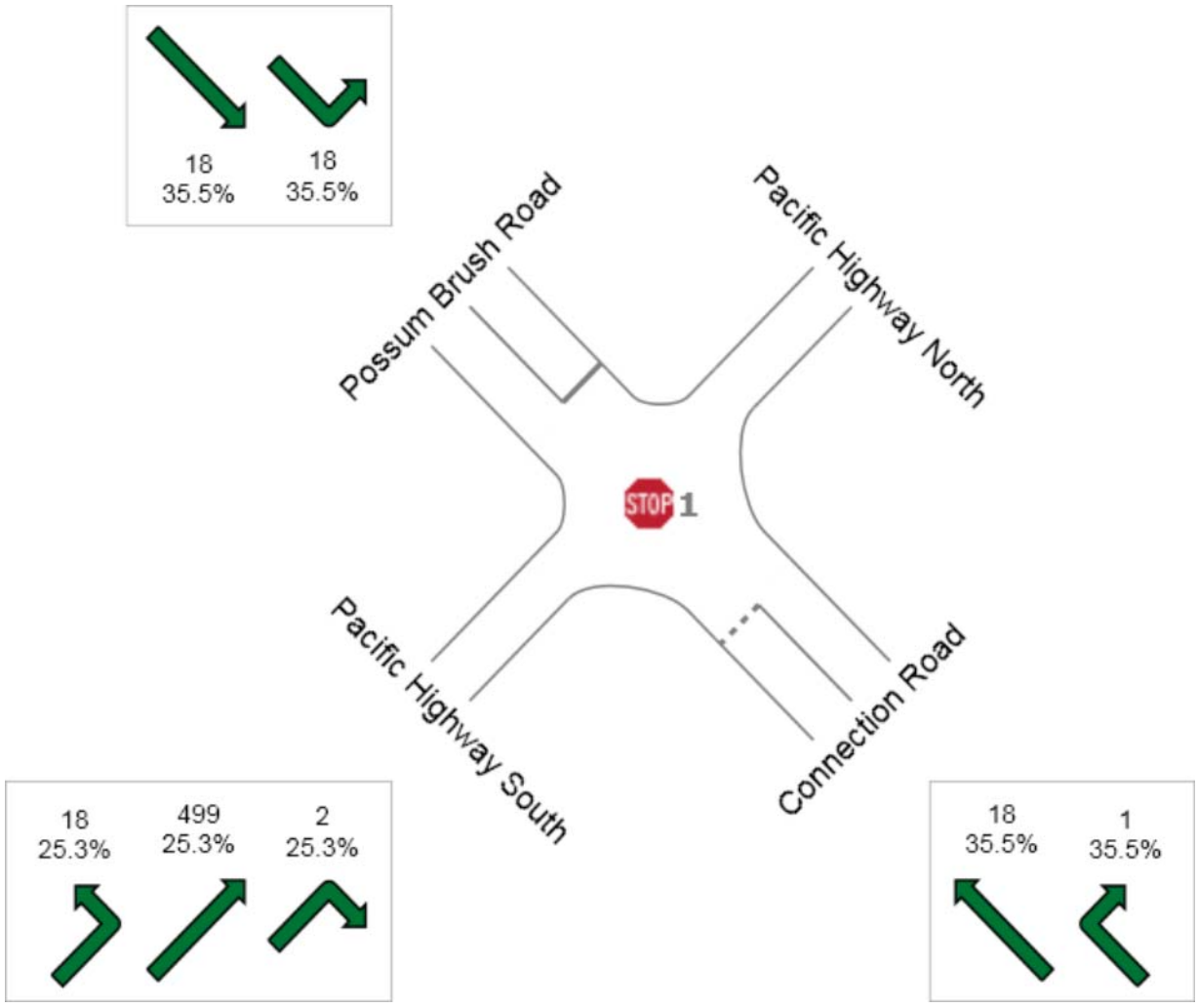
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 574

Light Vehicles (LV): 423

Heavy Vehicles (HV): 151



MOVEMENT SUMMARY

Site: Site1 - 2015 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2015 3pm Peak

Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	18	35.5	0.045	7.6	LOS A	0.2	1.5	0.61	0.62	43.8
6	R2	1	35.5	0.045	11.4	LOS A	0.2	1.5	0.61	0.62	40.2
Approach		19	35.5	0.045	7.8	LOS A	0.2	1.5	0.61	0.62	43.6
NorthWest: Possum Brush Road											
10	L2	18	35.5	0.075	13.6	LOS A	0.3	2.6	0.54	0.94	55.2
11	T1	18	35.5	0.075	20.2	LOS B	0.3	2.6	0.54	0.94	54.8
Approach		36	35.5	0.075	16.9	LOS B	0.3	2.6	0.54	0.94	55.1
SouthWest: Pacific Highway South											
1	L2	18	25.3	0.011	7.9	LOS A	0.0	0.0	0.00	0.65	62.1
2	T1	499	25.3	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	7.7	LOS A	0.0	0.0	0.00	0.69	37.3
Approach		519	25.3	0.149	0.3	NA	0.0	0.0	0.00	0.03	88.3
All Vehicles		574	26.3	0.149	1.6	NA	0.3	2.6	0.05	0.10	84.1

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound 2015 3pm Peak with no Quarry Traffic

Stop (Two-Way)

Volume Display Method: Total and %

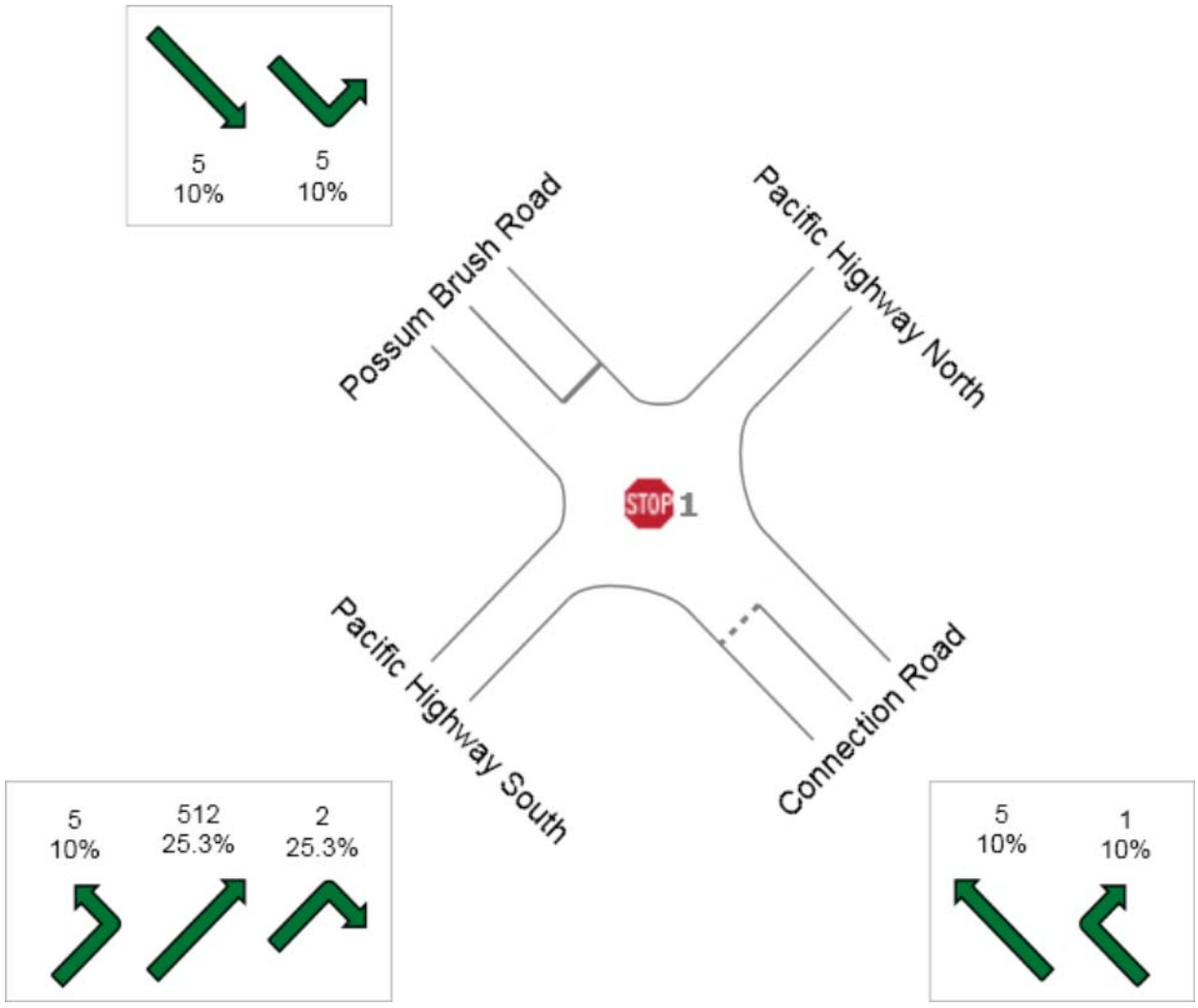
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 536

Light Vehicles (LV): 404

Heavy Vehicles (HV): 132



INTERSECTION SUMMARY

Site: Site1 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound 2015 3pm Peak with no Quarry Traffic

Stop (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	88.2	km/h	88.2	km/h
Travel Distance (Total)	535.3	veh-km/h	642.4	pers-km/h
Travel Time (Total)	6.1	veh-h/h	7.3	pers-h/h
Demand Flows (Total)	536	veh/h	643	pers/h
Percent Heavy Vehicles (Demand)	24.7	%		
Degree of Saturation	0.153			
Practical Spare Capacity	541.8	%		
Effective Intersection Capacity	3509	veh/h		
Control Delay (Total)	0.07	veh-h/h	0.08	pers-h/h
Control Delay (Average)	0.5	sec	0.5	sec
Control Delay (Worst Lane)	14.1	sec		
Control Delay (Worst Movement)	16.5	sec	16.5	sec
Geometric Delay (Average)	0.3	sec		
Stop-Line Delay (Average)	0.1	sec		
Idling Time (Average)	0.1	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.1	veh		
95% Back of Queue - Distance (Worst Lane)	0.5	m		
Queue Storage Ratio (Worst Lane)	0.00			
Total Effective Stops	17	veh/h	21	pers/h
Effective Stop Rate	0.03	per veh	0.03	per pers
Proportion Queued	0.02		0.02	
Performance Index	6.4		6.4	
Cost (Total)	234.56	$/h	234.56	$/h
Fuel Consumption (Total)	108.4	L/h		
Carbon Dioxide (Total)	268.2	kg/h		
Hydrocarbons (Total)	0.017	kg/h		
Carbon Monoxide (Total)	0.273	kg/h		
NOx (Total)	1.453	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	257,179	veh/y	308,615	pers/y
Delay	33	veh-h/y	39	pers-h/y
Effective Stops	8,316	veh/y	9,980	pers/y
Travel Distance	256,967	veh-km/y	308,361	pers-km/y
Travel Time	2,912	veh-h/y	3,494	pers-h/y
Cost	112,590	$/y	112,590	$/y
Fuel Consumption	52,036	L/y		
Carbon Dioxide	128,748	kg/y		
Hydrocarbons	8	kg/y		
Carbon Monoxide	131	kg/y		
NOx	698	kg/y		

MOVEMENT SUMMARY

Site: Site1 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound 2015 3pm Peak with no Quarry Traffic

Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	5	10.0	0.012	5.8	LOS A	0.0	0.4	0.58	0.53	52.1
6	R2	1	10.0	0.012	8.6	LOS A	0.0	0.4	0.58	0.53	49.0
Approach		6	10.0	0.012	6.2	LOS A	0.0	0.4	0.58	0.53	51.6
NorthWest: Possum Brush Road											
10	L2	5	10.0	0.018	11.7	LOS A	0.1	0.5	0.50	0.87	63.4
11	T1	5	10.0	0.018	16.5	LOS B	0.1	0.5	0.50	0.87	57.0
Approach		11	10.0	0.018	14.1	LOS A	0.1	0.5	0.50	0.87	60.9
SouthWest: Pacific Highway South											
1	L2	5	10.0	0.003	7.6	LOS A	0.0	0.0	0.00	0.65	66.9
2	T1	512	25.3	0.153	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	7.7	LOS A	0.0	0.0	0.00	0.69	37.3
Approach		519	25.1	0.153	0.1	NA	0.0	0.0	0.00	0.01	89.3
All Vehicles		536	24.7	0.153	0.5	NA	0.1	0.5	0.02	0.03	88.2

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak

Stop (Two-Way)

Volume Display Method: Total and %

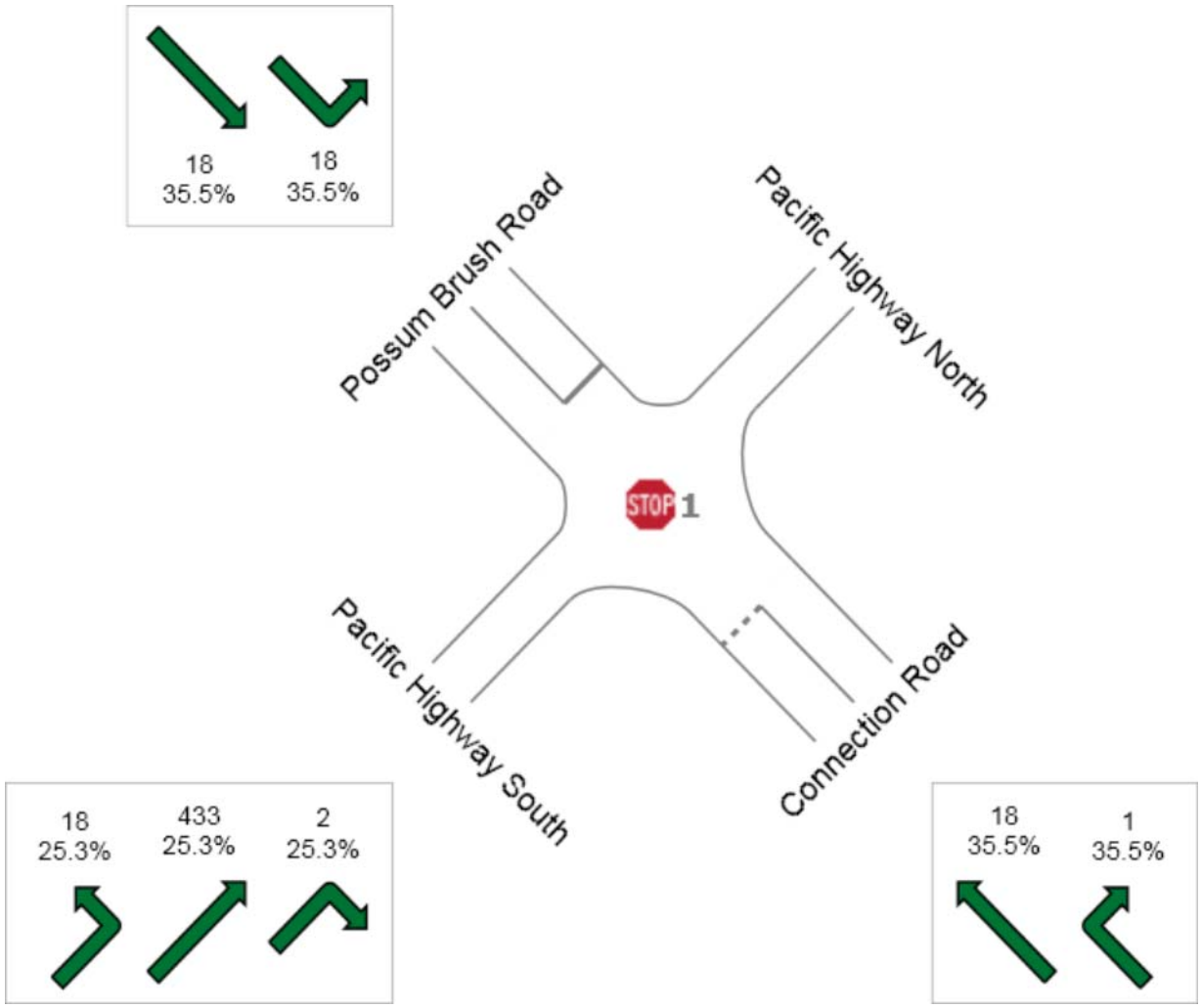
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 507

Light Vehicles (LV): 373

Heavy Vehicles (HV): 134



INTERSECTION SUMMARY

Site: Site1 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak

Stop (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	83.6	km/h	83.6	km/h
Travel Distance (Total)	495.7	veh-km/h	594.8	pers-km/h
Travel Time (Total)	5.9	veh-h/h	7.1	pers-h/h
Demand Flows (Total)	507	veh/h	609	pers/h
Percent Heavy Vehicles (Demand)	26.4	%		
Degree of Saturation	0.129			
Practical Spare Capacity	658.9	%		
Effective Intersection Capacity	3929	veh/h		
Control Delay (Total)	0.24	veh-h/h	0.28	pers-h/h
Control Delay (Average)	1.7	sec	1.7	sec
Control Delay (Worst Lane)	15.9	sec		
Control Delay (Worst Movement)	18.5	sec	18.5	sec
Geometric Delay (Average)	1.2	sec		
Stop-Line Delay (Average)	0.5	sec		
Idling Time (Average)	0.3	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.3	veh		
95% Back of Queue - Distance (Worst Lane)	2.4	m		
Queue Storage Ratio (Worst Lane)	0.01			
Total Effective Stops	57	veh/h	68	pers/h
Effective Stop Rate	0.11	per veh	0.11	per pers
Proportion Queued	0.06		0.06	
Performance Index	6.9		6.9	
Cost (Total)	244.33	$/h	244.33	$/h
Fuel Consumption (Total)	106.1	L/h		
Carbon Dioxide (Total)	262.7	kg/h		
Hydrocarbons (Total)	0.017	kg/h		
Carbon Monoxide (Total)	0.263	kg/h		
NOx (Total)	1.458	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	243,537	veh/y	292,244	pers/y
Delay	113	veh-h/y	136	pers-h/y
Effective Stops	27,200	veh/y	32,640	pers/y
Travel Distance	237,939	veh-km/y	285,527	pers-km/y
Travel Time	2,848	veh-h/y	3,417	pers-h/y
Cost	117,279	$/y	117,279	$/y
Fuel Consumption	50,949	L/y		
Carbon Dioxide	126,118	kg/y		
Hydrocarbons	8	kg/y		
Carbon Monoxide	126	kg/y		
NOx	700	kg/y		

LANE SUMMARY

Site: Site1 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak

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. %
SouthEast: Connection Road													
Lane 1	19	35.5	483	0.039	100	6.5	LOS A	0.2	1.4	Full	55	0.0	0.0
Approach	19	35.5		0.039		6.5	LOS A	0.2	1.4				
NorthWest: Possum Brush Road													
Lane 1	36	35.5	532	0.067	100	15.9	LOS B	0.3	2.4	Full	500	0.0	0.0
Approach	36	35.5		0.067		15.9	LOS B	0.3	2.4				
SouthWest: Pacific Highway South													
Lane 1	18	25.3	1574	0.011	100	7.9	LOS A	0.0	0.0	Short	150	0.0	NA
Lane 2	216	25.3	1675	0.129	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	216	25.3	1675	0.129	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 4	2	25.3	1574	0.001	100	7.7	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	453	25.3		0.129		0.4	NA	0.0	0.0				
Intersection	507	26.4		0.129		1.7	NA	0.3	2.4				

Level of Service (LOS) Method: Delay (RTA NSW).

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.

MOVEMENT SUMMARY

Site: Site1 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak

Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	18	35.5	0.039	6.3	LOS A	0.2	1.4	0.58	0.56	45.1
6	R2	1	35.5	0.039	9.7	LOS A	0.2	1.4	0.58	0.56	41.3
Approach		19	35.5	0.039	6.5	LOS A	0.2	1.4	0.58	0.56	44.8
NorthWest: Possum Brush Road											
10	L2	18	35.5	0.067	13.3	LOS A	0.3	2.4	0.50	0.92	56.0
11	T1	18	35.5	0.067	18.5	LOS B	0.3	2.4	0.50	0.92	56.2
Approach		36	35.5	0.067	15.9	LOS B	0.3	2.4	0.50	0.92	56.1
SouthWest: Pacific Highway South											
1	L2	18	25.3	0.011	7.9	LOS A	0.0	0.0	0.00	0.65	62.1
2	T1	433	25.3	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	7.7	LOS A	0.0	0.0	0.00	0.69	37.3
Approach		453	25.3	0.129	0.4	NA	0.0	0.0	0.00	0.03	88.0
All Vehicles		507	26.4	0.129	1.7	NA	0.3	2.4	0.06	0.11	83.6

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2015 9am Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak No Quarry Traffic

Stop (Two-Way)

Volume Display Method: Total and %

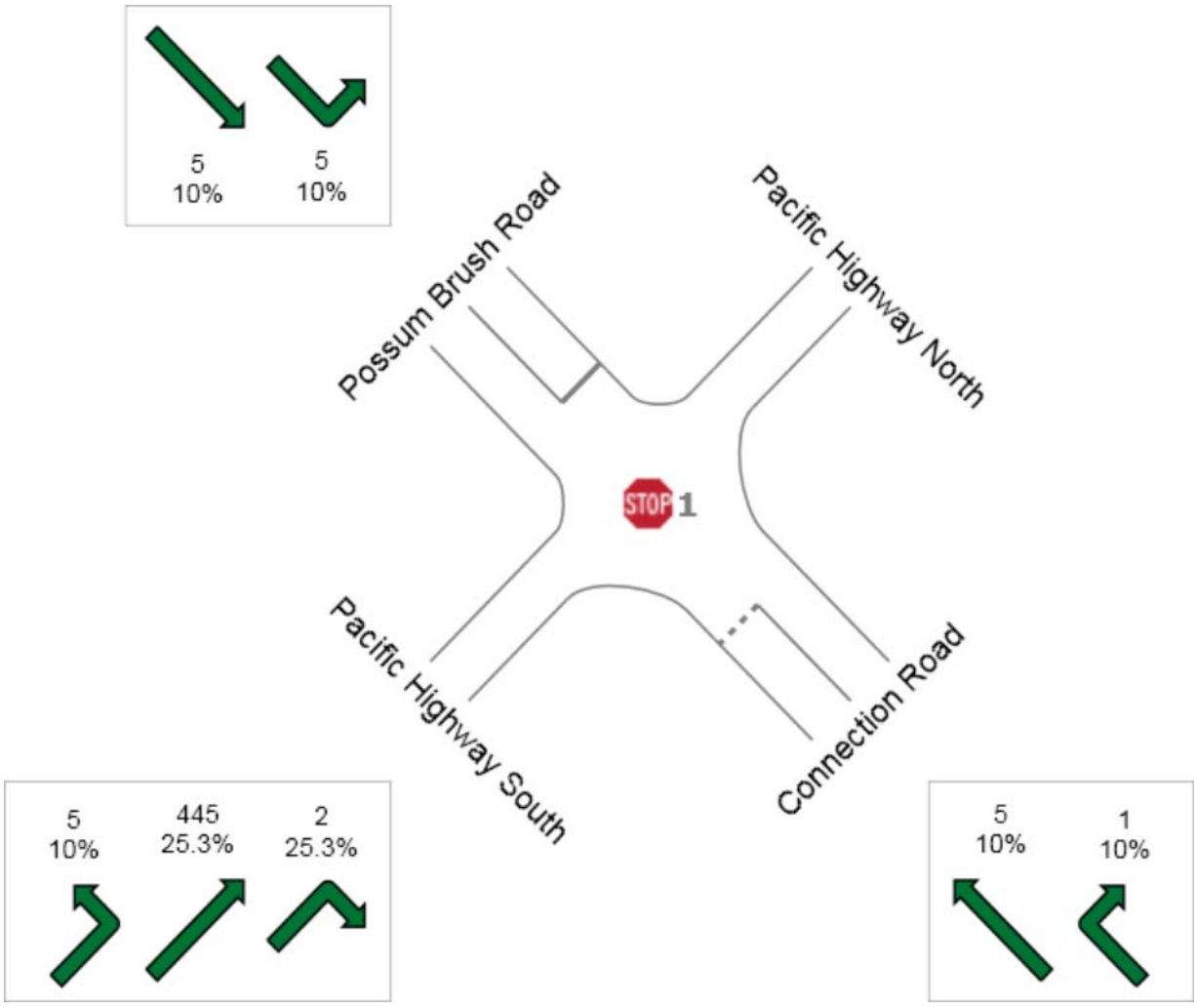
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 469

Light Vehicles (LV): 354

Heavy Vehicles (HV): 115



INTERSECTION SUMMARY

Site: Site1 - 2015 9am Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak No Quarry Traffic

Stop (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	88.1	km/h	88.1	km/h
Travel Distance (Total)	468.3	veh-km/h	562.0	pers-km/h
Travel Time (Total)	5.3	veh-h/h	6.4	pers-h/h
Demand Flows (Total)	469	veh/h	563	pers/h
Percent Heavy Vehicles (Demand)	24.6	%		
Degree of Saturation	0.133			
Practical Spare Capacity	637.4	%		
Effective Intersection Capacity	3532	veh/h		
Control Delay (Total)	0.06	veh-h/h	0.08	pers-h/h
Control Delay (Average)	0.5	sec	0.5	sec
Control Delay (Worst Lane)	13.4	sec		
Control Delay (Worst Movement)	15.3	sec	15.3	sec
Geometric Delay (Average)	0.4	sec		
Stop-Line Delay (Average)	0.1	sec		
Idling Time (Average)	0.1	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.1	veh		
95% Back of Queue - Distance (Worst Lane)	0.5	m		
Queue Storage Ratio (Worst Lane)	0.00			
Total Effective Stops	17	veh/h	20	pers/h
Effective Stop Rate	0.04	per veh	0.04	per pers
Proportion Queued	0.02		0.02	
Performance Index	5.6		5.6	
Cost (Total)	205.82	$/h	205.82	$/h
Fuel Consumption (Total)	94.8	L/h		
Carbon Dioxide (Total)	234.5	kg/h		
Hydrocarbons (Total)	0.015	kg/h		
Carbon Monoxide (Total)	0.240	kg/h		
NOx (Total)	1.269	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	225,347	veh/y	270,417	pers/y
Delay	31	veh-h/y	37	pers-h/y
Effective Stops	8,146	veh/y	9,775	pers/y
Travel Distance	224,808	veh-km/y	269,769	pers-km/y
Travel Time	2,552	veh-h/y	3,063	pers-h/y
Cost	98,795	$/y	98,795	$/y
Fuel Consumption	45,504	L/y		
Carbon Dioxide	112,571	kg/y		
Hydrocarbons	7	kg/y		
Carbon Monoxide	115	kg/y		
NOx	609	kg/y		

LANE SUMMARY

Site: Site1 - 2015 9am Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak No Quarry Traffic

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. %
SouthEast: Connection Road													
Lane 1	6	10.0	576	0.011	100	5.3	LOS A	0.0	0.3	Full	55	0.0	0.0
Approach	6	10.0		0.011		5.3	LOS A	0.0	0.3				
NorthWest: Possum Brush Road													
Lane 1	11	10.0	634	0.017	100	13.4	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	11	10.0		0.017		13.4	LOS A	0.1	0.5				
SouthWest: Pacific Highway South													
Lane 1	5	10.0	1734	0.003	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Lane 2	223	25.3	1675	0.133	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	223	25.3	1675	0.133	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 4	2	25.3	1574	0.001	100	7.7	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	453	25.1		0.133		0.1	NA	0.0	0.0				
Intersection	469	24.6		0.133		0.5	NA	0.1	0.5				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site1 - 2015 9am Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Northbound Existing 9am Peak No Quarry Traffic

Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	5	10.0	0.011	4.9	LOS A	0.0	0.3	0.55	0.49	53.4
6	R2	1	10.0	0.011	7.5	LOS A	0.0	0.3	0.55	0.49	50.2
Approach		6	10.0	0.011	5.3	LOS A	0.0	0.3	0.55	0.49	52.8
NorthWest: Possum Brush Road											
10	L2	5	10.0	0.017	11.5	LOS A	0.1	0.5	0.46	0.86	64.1
11	T1	5	10.0	0.017	15.3	LOS B	0.1	0.5	0.46	0.86	58.0
Approach		11	10.0	0.017	13.4	LOS A	0.1	0.5	0.46	0.86	61.8
SouthWest: Pacific Highway South											
1	L2	5	10.0	0.003	7.6	LOS A	0.0	0.0	0.00	0.65	66.9
2	T1	445	25.3	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	7.7	LOS A	0.0	0.0	0.00	0.69	37.3
Approach		453	25.1	0.133	0.1	NA	0.0	0.0	0.00	0.01	89.2
All Vehicles		469	24.6	0.133	0.5	NA	0.1	0.5	0.02	0.04	88.1

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 3pm Peak
Stop (Two-Way)

Volume Display Method: Total and %

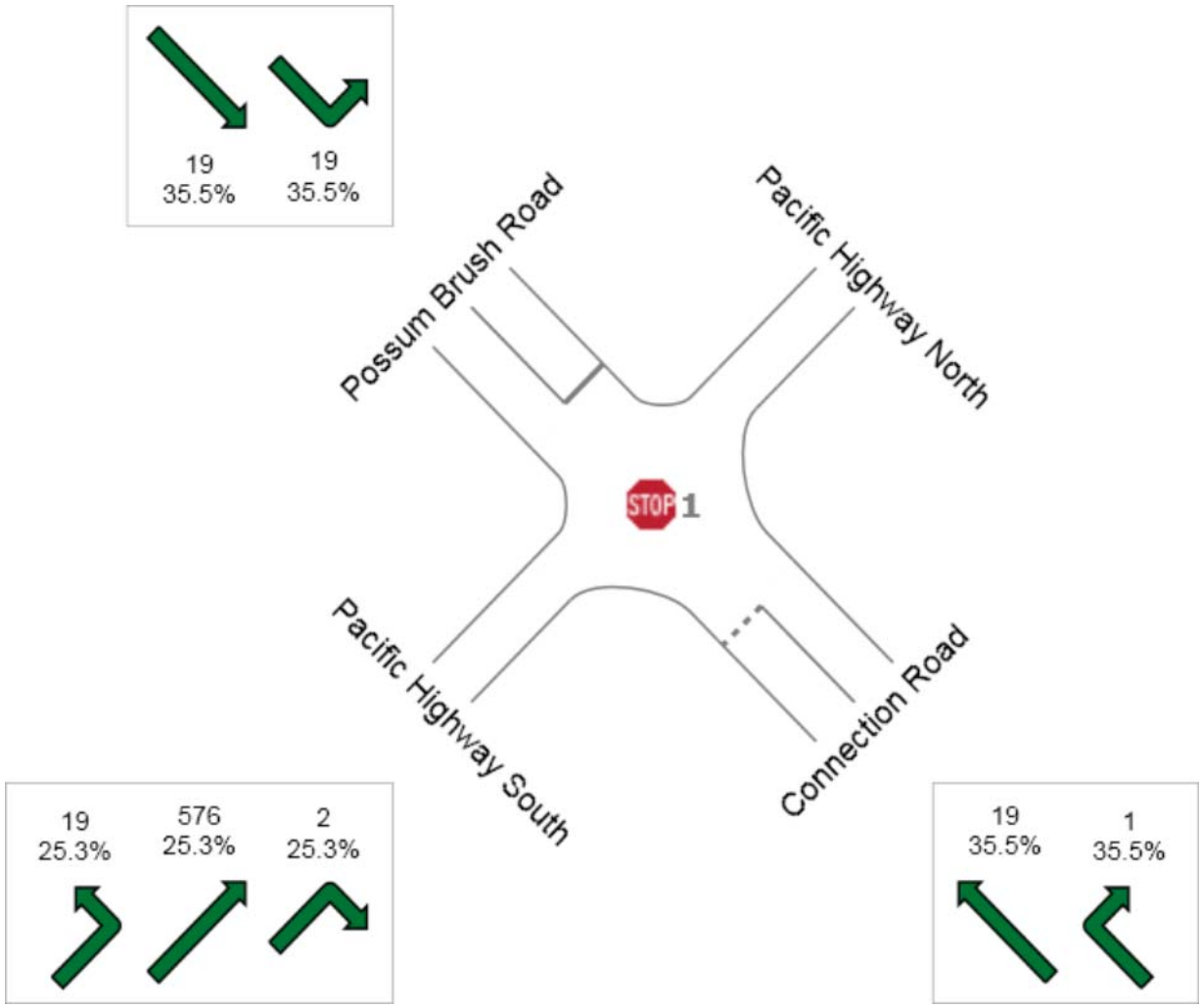
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 655

Light Vehicles (LV): 483

Heavy Vehicles (HV): 172



INTERSECTION SUMMARY

Site: Site1 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 3pm Peak
Stop (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	84.1	km/h	84.1	km/h
Travel Distance (Total)	643.7	veh-km/h	772.4	pers-km/h
Travel Time (Total)	7.7	veh-h/h	9.2	pers-h/h
Demand Flows (Total)	655	veh/h	786	pers/h
Percent Heavy Vehicles (Demand)	26.2	%		
Degree of Saturation	0.172			
Practical Spare Capacity	470.2	%		
Effective Intersection Capacity	3810	veh/h		
Control Delay (Total)	0.29	veh-h/h	0.35	pers-h/h
Control Delay (Average)	1.6	sec	1.6	sec
Control Delay (Worst Lane)	18.4	sec		
Control Delay (Worst Movement)	22.7	sec	22.7	sec
Geometric Delay (Average)	0.9	sec		
Stop-Line Delay (Average)	0.7	sec		
Idling Time (Average)	0.5	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.3	veh		
95% Back of Queue - Distance (Worst Lane)	3.1	m		
Queue Storage Ratio (Worst Lane)	0.01			
Total Effective Stops	63	veh/h	76	pers/h
Effective Stop Rate	0.10	per veh	0.10	per pers
Proportion Queued	0.05		0.05	
Performance Index	8.9		8.9	
Cost (Total)	311.57	$/h	311.57	$/h
Fuel Consumption (Total)	136.6	L/h		
Carbon Dioxide (Total)	338.3	kg/h		
Hydrocarbons (Total)	0.021	kg/h		
Carbon Monoxide (Total)	0.339	kg/h		
NOx (Total)	1.873	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	314,274	veh/y	377,128	pers/y
Delay	139	veh-h/y	167	pers-h/y
Effective Stops	30,446	veh/y	36,536	pers/y
Travel Distance	308,967	veh-km/y	370,761	pers-km/y
Travel Time	3,674	veh-h/y	4,409	pers-h/y
Cost	149,554	$/y	149,554	$/y
Fuel Consumption	65,589	L/y		
Carbon Dioxide	162,371	kg/y		
Hydrocarbons	10	kg/y		
Carbon Monoxide	163	kg/y		
NOx	899	kg/y		

LANE SUMMARY

Site: Site1 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 3pm Peak
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. %
SouthEast: Connection Road													
Lane 1	20	35.5	363	0.055	100	9.6	LOS A	0.2	1.9	Full	55	0.0	0.0
Approach	20	35.5		0.055		9.6	LOS A	0.2	1.9				
NorthWest: Possum Brush Road													
Lane 1	38	35.5	414	0.092	100	18.4	LOS B	0.3	3.1	Full	500	0.0	0.0
Approach	38	35.5		0.092		18.4	LOS B	0.3	3.1				
SouthWest: Pacific Highway South													
Lane 1	19	25.3	1574	0.012	100	7.9	LOS A	0.0	0.0	Short	150	0.0	NA
Lane 2	288	25.3	1675	0.172	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	288	25.3	1675	0.172	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 4	2	25.3	1574	0.001	100	2.7	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	597	25.3		0.172		0.3	NA	0.0	0.0				
Intersection	655	26.2		0.172		1.6	NA	0.3	3.1				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site1 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 3pm Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	19	35.5	0.055	9.4	LOS A	0.2	1.9	0.66	0.70	42.2
6	R2	1	35.5	0.055	13.8	LOS A	0.2	1.9	0.66	0.70	38.9
Approach		20	35.5	0.055	9.6	LOS A	0.2	1.9	0.66	0.70	42.0
NorthWest: Possum Brush Road											
10	L2	19	35.5	0.092	14.1	LOS A	0.3	3.1	0.58	0.96	54.1
11	T1	19	35.5	0.092	22.7	LOS B	0.3	3.1	0.58	0.96	52.8
Approach		38	35.5	0.092	18.4	LOS B	0.3	3.1	0.58	0.96	53.6
SouthWest: Pacific Highway South											
1	L2	19	25.3	0.012	7.9	LOS A	0.0	0.0	0.00	0.65	62.1
2	T1	576	25.3	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	2.7	LOS A	0.0	0.0	0.00	0.43	29.0
Approach		597	25.3	0.172	0.3	NA	0.0	0.0	0.00	0.02	88.3
All Vehicles		655	26.2	0.172	1.6	NA	0.3	3.1	0.05	0.10	84.1

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site1 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 3pm Peak
Stop (Two-Way)

Volume Display Method: Total and %

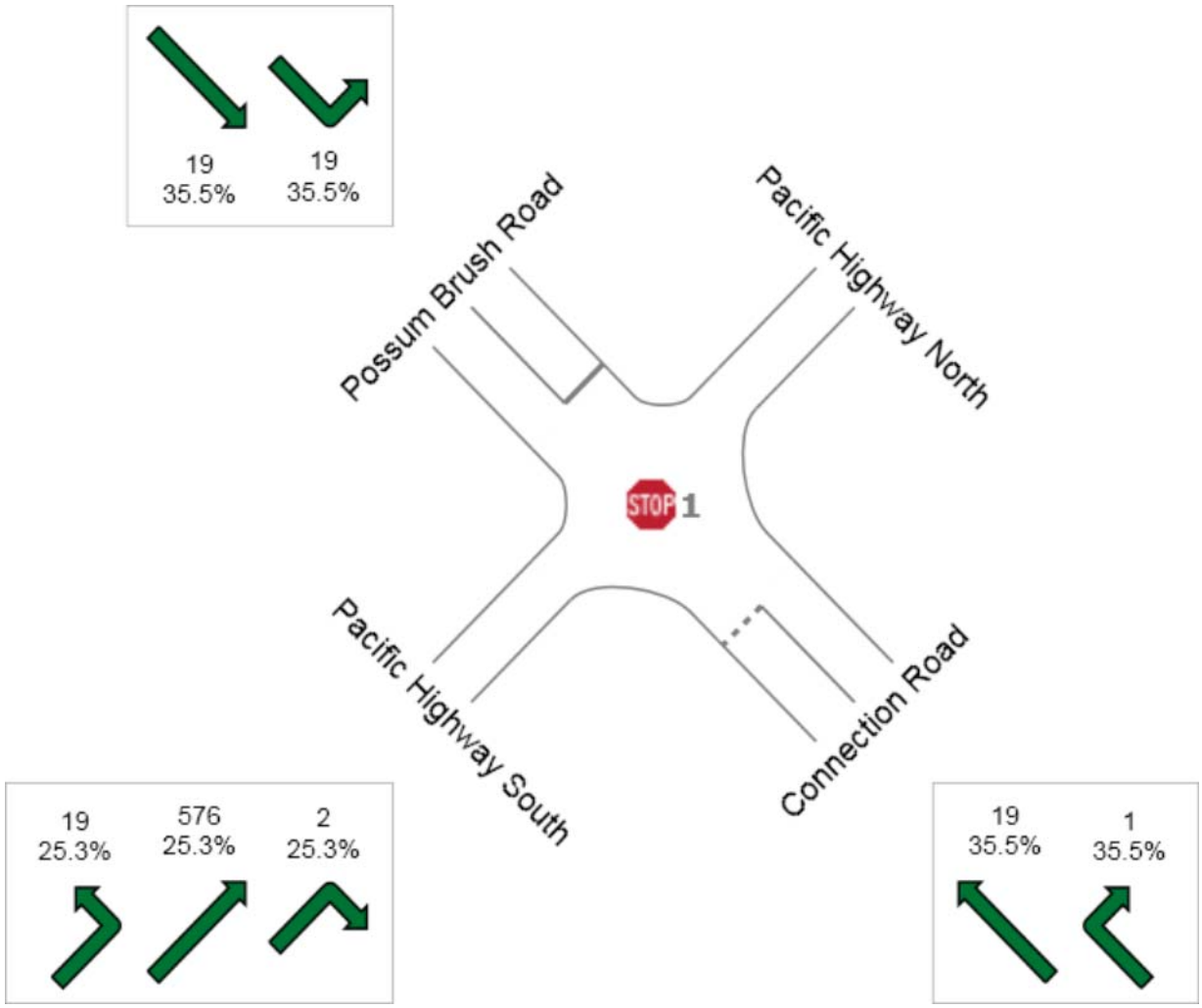
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 655

Light Vehicles (LV): 483

Heavy Vehicles (HV): 172



LANE SUMMARY

Site: Site1 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 9am Peak
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. %
SouthEast: Connection Road													
Lane 1	20	35.5	398	0.050	100	8.5	LOS A	0.2	1.7	Full	55	0.0	0.0
Approach	20	35.5		0.050		8.5	LOS A	0.2	1.7				
NorthWest: Possum Brush Road													
Lane 1	38	35.5	449	0.084	100	17.5	LOS B	0.3	2.9	Full	500	0.0	0.0
Approach	38	35.5		0.084		17.5	LOS B	0.3	2.9				
SouthWest: Pacific Highway South													
Lane 1	19	25.3	1574	0.012	100	7.9	LOS A	0.0	0.0	Short	150	0.0	NA
Lane 2	265	25.3	1675	0.158	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	265	25.3	1675	0.158	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 4	2	25.3	1574	0.001	100	7.7	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	552	25.3		0.158		0.3	NA	0.0	0.0				
Intersection	609	26.3		0.158		1.6	NA	0.3	2.9				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site1 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Northbound 2025 9am Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
SouthEast: Connection Road											
5	T1	19	35.5	0.050	8.3	LOS A	0.2	1.7	0.63	0.65	43.1
6	R2	1	35.5	0.050	12.3	LOS A	0.2	1.7	0.63	0.65	39.7
Approach		20	35.5	0.050	8.5	LOS A	0.2	1.7	0.63	0.65	43.0
NorthWest: Possum Brush Road											
10	L2	19	35.5	0.084	13.8	LOS A	0.3	2.9	0.56	0.95	54.8
11	T1	19	35.5	0.084	21.2	LOS B	0.3	2.9	0.56	0.95	54.0
Approach		38	35.5	0.084	17.5	LOS B	0.3	2.9	0.56	0.95	54.5
SouthWest: Pacific Highway South											
1	L2	19	25.3	0.012	7.9	LOS A	0.0	0.0	0.00	0.65	62.1
2	T1	531	25.3	0.158	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
3	R2	2	25.3	0.001	7.7	LOS A	0.0	0.0	0.00	0.69	37.3
Approach		552	25.3	0.158	0.3	NA	0.0	0.0	0.00	0.02	88.3
All Vehicles		609	26.3	0.158	1.6	NA	0.3	2.9	0.06	0.10	84.0

Level of Service (LOS) Method: Delay (RTA NSW).
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.

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site2 - 2015 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

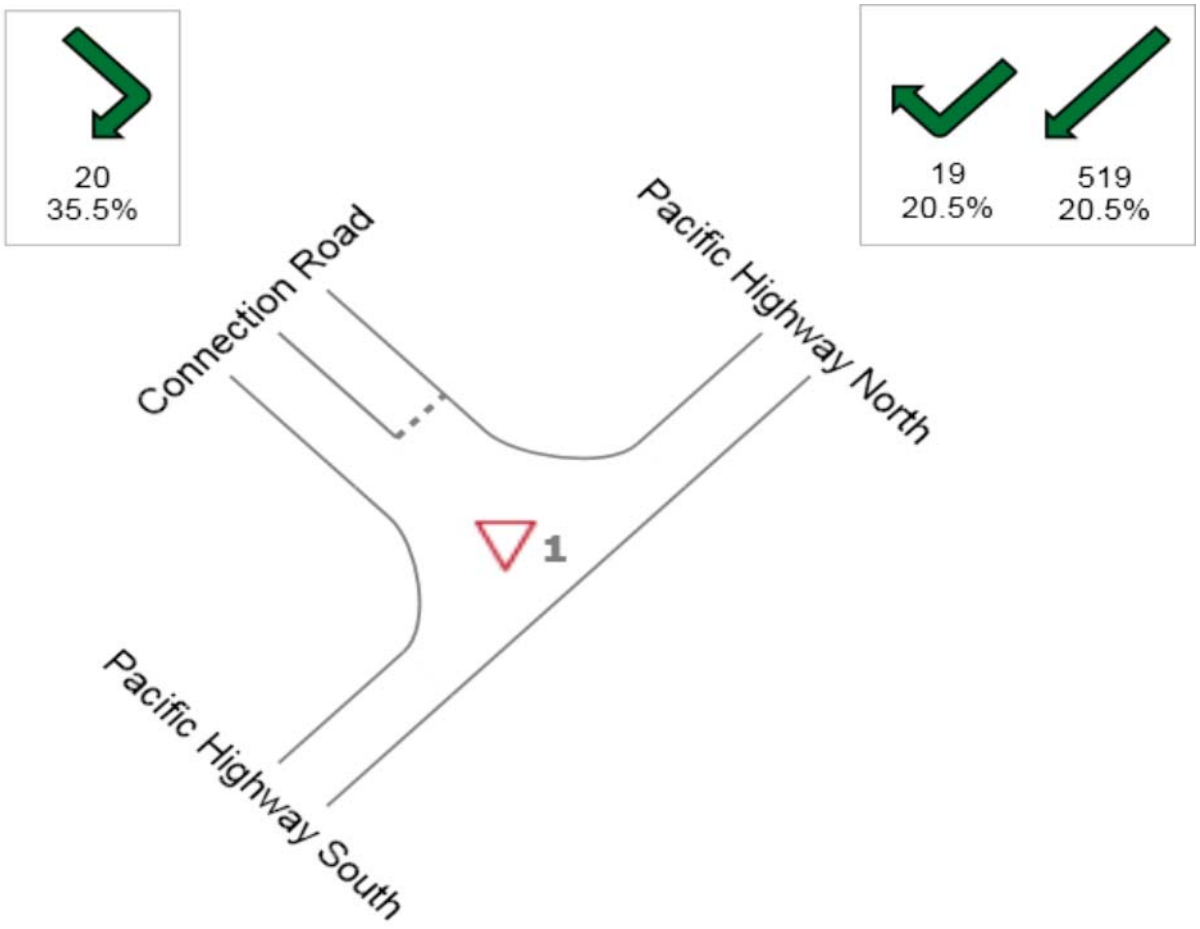
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 558

Light Vehicles (LV): 441

Heavy Vehicles (HV): 117



INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Site2 - 2015 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

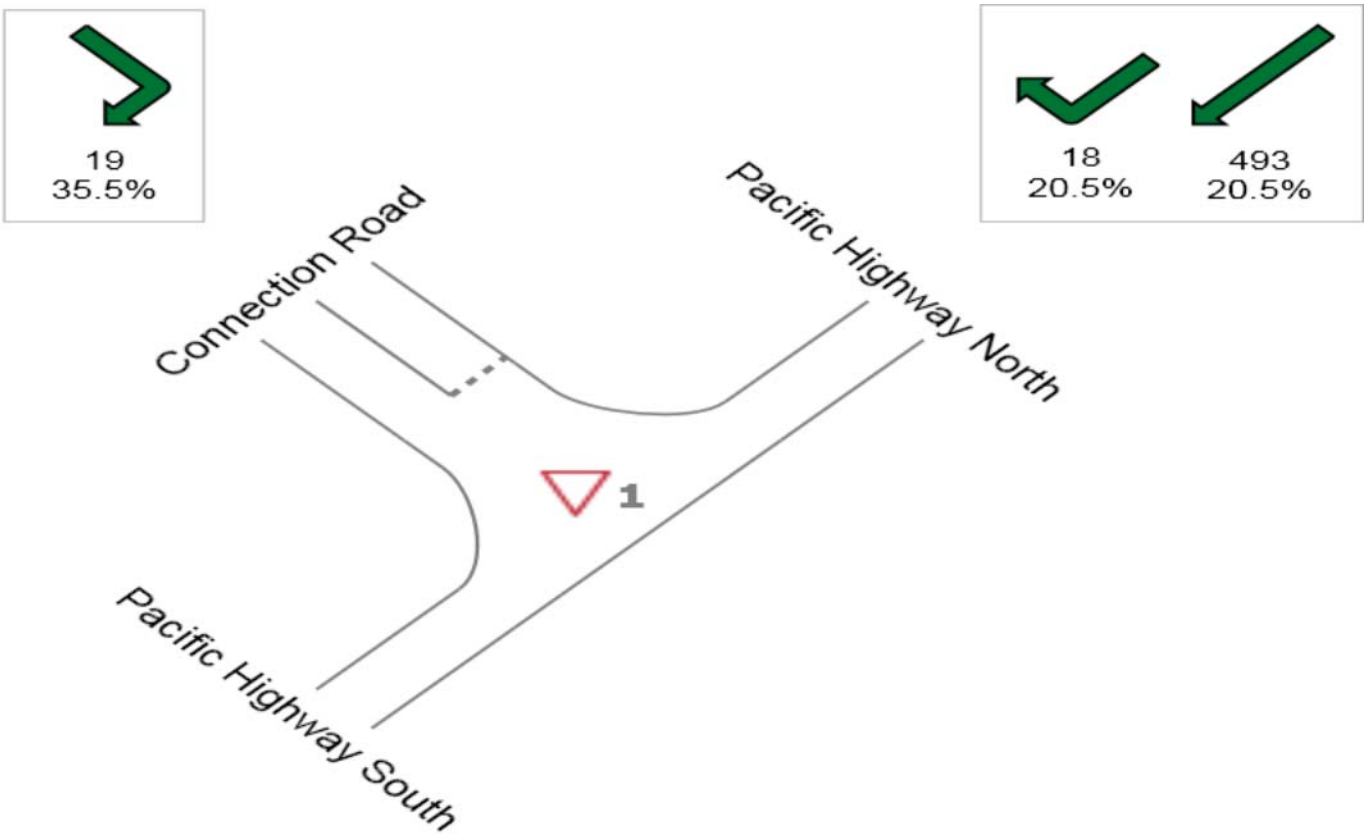
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 530

Light Vehicles (LV): 419

Heavy Vehicles (HV): 112



LANE SUMMARY

Site: Site2 - 2015 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak
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. %
NorthEast: Pacific Highway North													
Lane 1	259	20.5	1730	0.150	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	259	20.5	1730	0.150	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	19	20.5	1629	0.012	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	538	20.5		0.150		0.3	NA	0.0	0.0				
NorthWest: Connection Road													
Lane 1	20	35.5	523	0.038	100	7.5	LOS A	0.1	1.3	Full	55	0.0	0.0
Approach	20	35.5		0.038		7.5	LOS A	0.1	1.3				
Intersection	558	21.0		0.150		0.5	NA	0.1	1.3				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Site2 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak with no Quarry Traffic
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

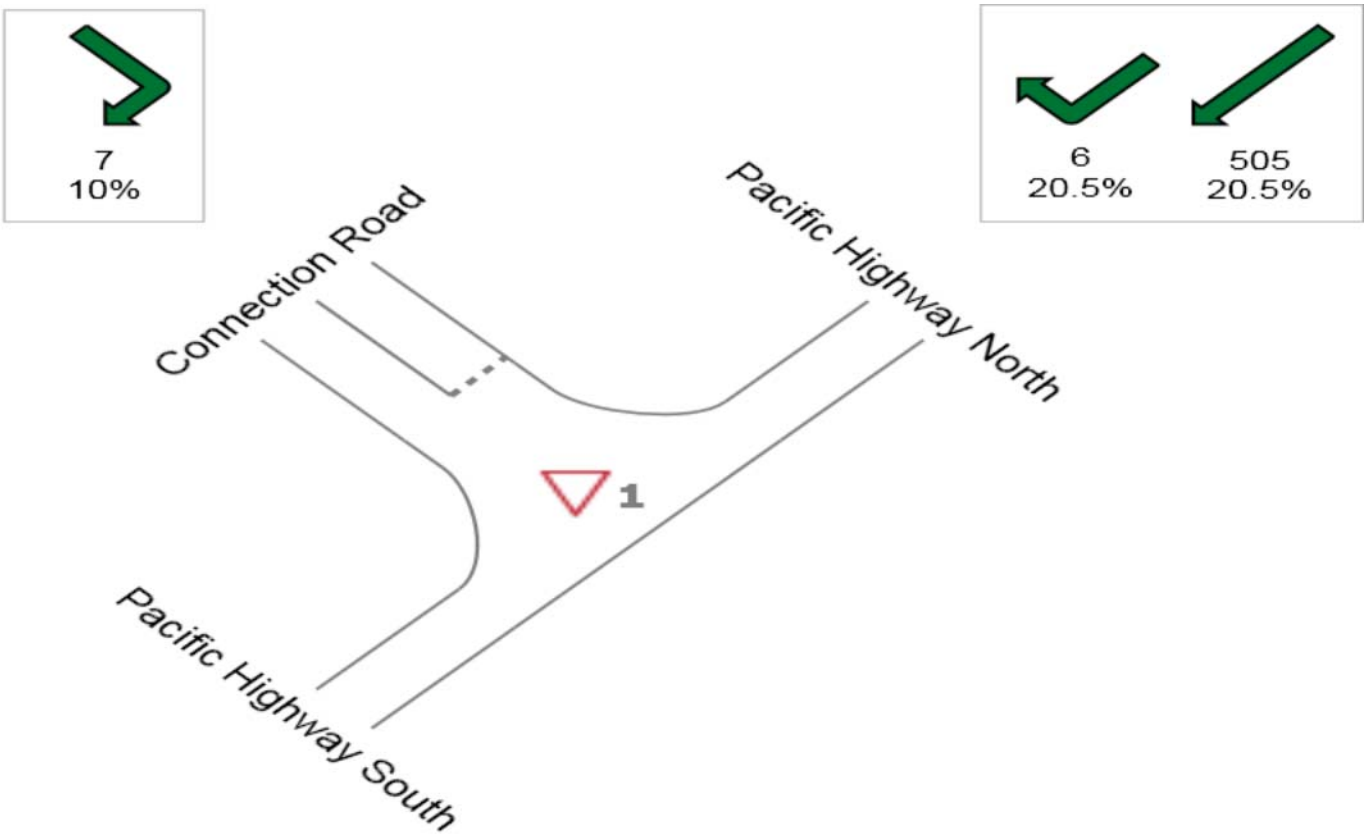
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 518

Light Vehicles (LV): 413

Heavy Vehicles (HV): 105



INTERSECTION SUMMARY

Site: Site2 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak with no Quarry Traffic
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	88.6	km/h	88.6	km/h
Travel Distance (Total)	544.8	veh-km/h	653.7	pers-km/h
Travel Time (Total)	6.2	veh-h/h	7.4	pers-h/h
Demand Flows (Total)	545	veh/h	654	pers/h
Percent Heavy Vehicles (Demand)	20.4	%		
Degree of Saturation	0.154			
Practical Spare Capacity	537.8	%		
Effective Intersection Capacity	3549	veh/h		
Control Delay (Total)	0.03	veh-h/h	0.03	pers-h/h
Control Delay (Average)	0.2	sec	0.2	sec
Control Delay (Worst Lane)	7.6	sec		
Control Delay (Worst Movement)	7.6	sec	7.6	sec
Geometric Delay (Average)	0.1	sec		
Stop-Line Delay (Average)	0.0	sec		
Idling Time (Average)	0.0	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.0	veh		
95% Back of Queue - Distance (Worst Lane)	0.3	m		
Queue Storage Ratio (Worst Lane)	0.00			
Total Effective Stops	9	veh/h	10	pers/h
Effective Stop Rate	0.02	per veh	0.02	per pers
Proportion Queued	0.01		0.01	
Performance Index	6.3		6.3	
Cost (Total)	195.58	$/h	195.58	$/h
Fuel Consumption (Total)	63.6	L/h		
Carbon Dioxide (Total)	154.9	kg/h		
Hydrocarbons (Total)	0.013	kg/h		
Carbon Monoxide (Total)	0.247	kg/h		
NOx (Total)	0.605	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	261,726	veh/y	314,072	pers/y
Delay	12	veh-h/y	15	pers-h/y
Effective Stops	4,174	veh/y	5,009	pers/y
Travel Distance	261,497	veh-km/y	313,797	pers-km/y
Travel Time	2,953	veh-h/y	3,543	pers-h/y
Cost	93,879	$/y	93,879	$/y
Fuel Consumption	30,519	L/y		
Carbon Dioxide	74,369	kg/y		
Hydrocarbons	6	kg/y		
Carbon Monoxide	119	kg/y		
NOx	290	kg/y		

LANE SUMMARY

Site: Site2 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak with no Quarry Traffic
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. %
NorthEast: Pacific Highway North													
Lane 1	266	20.5	1730	0.154	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	266	20.5	1730	0.154	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	6	20.5	1629	0.004	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	538	20.5		0.154		0.1	NA	0.0	0.0				
NorthWest: Connection Road													
Lane 1	7	10.0	638	0.012	100	6.1	LOS A	0.0	0.3	Full	55	0.0	0.0
Approach	7	10.0		0.012		6.1	LOS A	0.0	0.3				
Intersection	545	20.4		0.154		0.2	NA	0.0	0.3				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site2 - 2015 3pm Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Southbound 2015 3pm Peak with no Quarry Traffic
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
NorthEast: Pacific Highway North											
8	T1	532	20.5	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
9	R2	6	20.5	0.004	7.6	LOS A	0.0	0.0	0.00	0.69	37.4
Approach		538	20.5	0.154	0.1	NA	0.0	0.0	0.00	0.01	89.1
NorthWest: Connection Road											
12	R2	7	10.0	0.012	6.1	LOS A	0.0	0.3	0.53	0.59	49.5
Approach		7	10.0	0.012	6.1	LOS A	0.0	0.3	0.53	0.59	49.5
All Vehicles		545	20.4	0.154	0.2	NA	0.0	0.3	0.01	0.02	88.6

Level of Service (LOS) Method: Delay (RTA NSW).
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.

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Site2 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound Existing 9am Peak
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

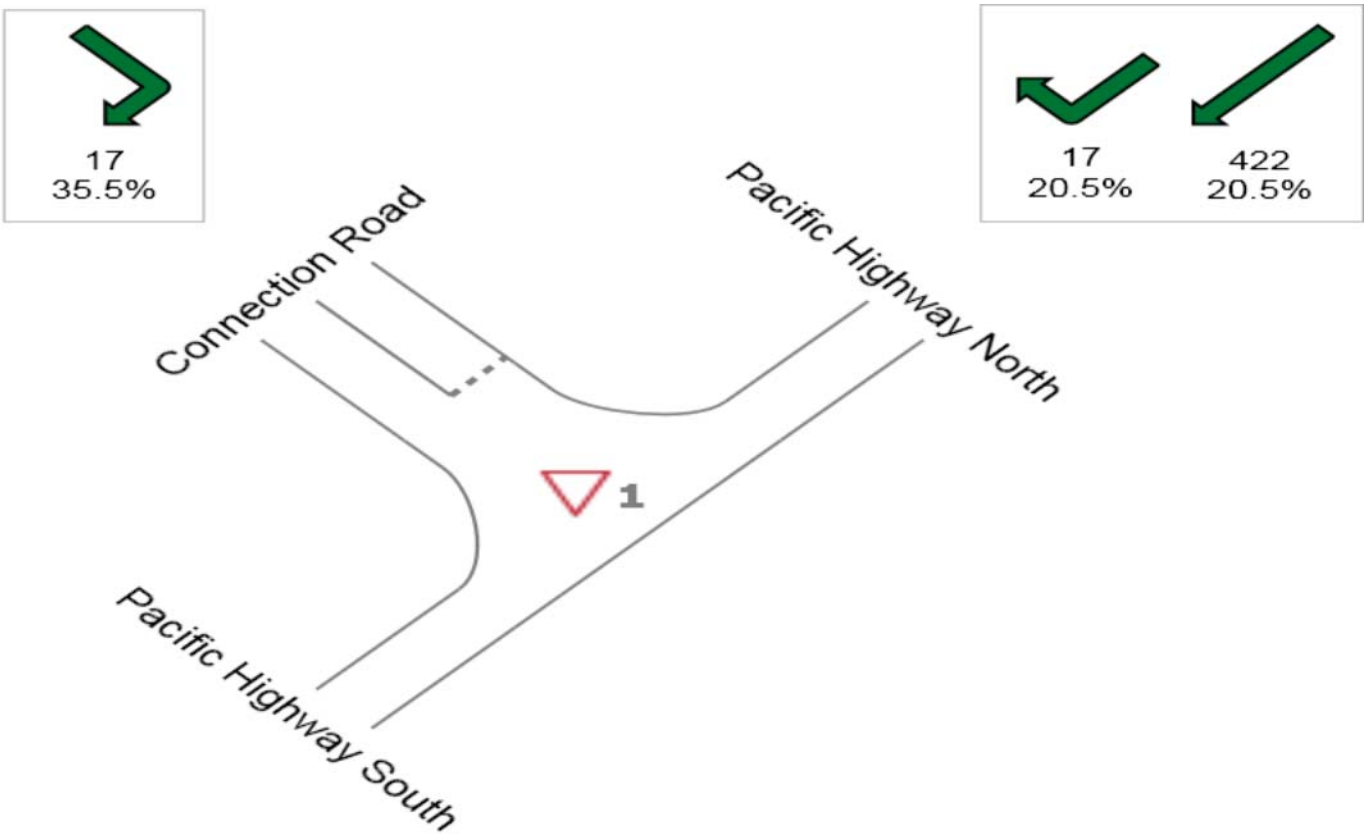
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 456

Light Vehicles (LV): 360

Heavy Vehicles (HV): 96



INTERSECTION SUMMARY

Site: Site2 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound Existing 9am Peak
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	85.2	km/h	85.2	km/h
Travel Distance (Total)	469.0	veh-km/h	562.8	pers-km/h
Travel Time (Total)	5.5	veh-h/h	6.6	pers-h/h
Demand Flows (Total)	480	veh/h	576	pers/h
Percent Heavy Vehicles (Demand)	21.1	%		
Degree of Saturation	0.128			
Practical Spare Capacity	663.3	%		
Effective Intersection Capacity	3739	veh/h		
Control Delay (Total)	0.07	veh-h/h	0.08	pers-h/h
Control Delay (Average)	0.5	sec	0.5	sec
Control Delay (Worst Lane)	7.6	sec		
Control Delay (Worst Movement)	7.6	sec	7.6	sec
Geometric Delay (Average)	0.4	sec		
Stop-Line Delay (Average)	0.1	sec		
Idling Time (Average)	0.1	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.1	veh		
95% Back of Queue - Distance (Worst Lane)	1.0	m		
Queue Storage Ratio (Worst Lane)	0.01			
Total Effective Stops	23	veh/h	28	pers/h
Effective Stop Rate	0.05	per veh	0.05	per pers
Proportion Queued	0.02		0.02	
Performance Index	5.7		5.7	
Cost (Total)	178.76	$/h	178.76	$/h
Fuel Consumption (Total)	57.3	L/h		
Carbon Dioxide (Total)	139.8	kg/h		
Hydrocarbons (Total)	0.012	kg/h		
Carbon Monoxide (Total)	0.217	kg/h		
NOx (Total)	0.567	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	230,400	veh/y	276,480	pers/y
Delay	34	veh-h/y	40	pers-h/y
Effective Stops	11,213	veh/y	13,456	pers/y
Travel Distance	225,123	veh-km/y	270,148	pers-km/y
Travel Time	2,641	veh-h/y	3,170	pers-h/y
Cost	85,803	$/y	85,803	$/y
Fuel Consumption	27,503	L/y		
Carbon Dioxide	67,092	kg/y		
Hydrocarbons	6	kg/y		
Carbon Monoxide	104	kg/y		
NOx	272	kg/y		

LANE SUMMARY

Site: Site2 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound Existing 9am Peak
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. %
NorthEast: Pacific Highway North													
Lane 1	222	20.5	1730	0.128	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	222	20.5	1730	0.128	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	18	20.5	1629	0.011	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	462	20.5		0.128		0.3	NA	0.0	0.0				
NorthWest: Connection Road													
Lane 1	18	35.5	591	0.030	100	6.5	LOS A	0.1	1.0	Full	55	0.0	0.0
Approach	18	35.5		0.030		6.5	LOS A	0.1	1.0				
Intersection	480	21.1		0.128		0.5	NA	0.1	1.0				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site2 - 2015 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound Existing 9am Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
NorthEast: Pacific Highway North											
8	T1	444	20.5	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
9	R2	18	20.5	0.011	7.6	LOS A	0.0	0.0	0.00	0.69	37.4
Approach		462	20.5	0.128	0.3	NA	0.0	0.0	0.00	0.03	87.2
NorthWest: Connection Road											
12	R2	18	35.5	0.030	6.5	LOS A	0.1	1.0	0.53	0.62	41.6
Approach		18	35.5	0.030	6.5	LOS A	0.1	1.0	0.53	0.62	41.6
All Vehicles		480	21.1	0.128	0.5	NA	0.1	1.0	0.02	0.05	85.2

Level of Service (LOS) Method: Delay (RTA NSW).
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.

INTERSECTION SUMMARY

Site: Site2 - 2015 9am Peak - No Quarry

Possum Brush Road & Pacific Highway Intersection - Southbound Existing 9am Peak with no Quarry Traffic
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	88.5	km/h	88.5	km/h
Travel Distance (Total)	468.7	veh-km/h	562.4	pers-km/h
Travel Time (Total)	5.3	veh-h/h	6.4	pers-h/h
Demand Flows (Total)	469	veh/h	563	pers/h
Percent Heavy Vehicles (Demand)	20.3	%		
Degree of Saturation	0.132			
Practical Spare Capacity	642.2	%		
Effective Intersection Capacity	3555	veh/h		
Control Delay (Total)	0.02	veh-h/h	0.03	pers-h/h
Control Delay (Average)	0.2	sec	0.2	sec
Control Delay (Worst Lane)	7.6	sec		
Control Delay (Worst Movement)	7.6	sec	7.6	sec
Geometric Delay (Average)	0.1	sec		
Stop-Line Delay (Average)	0.0	sec		
Idling Time (Average)	0.0	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.0	veh		
95% Back of Queue - Distance (Worst Lane)	0.3	m		
Queue Storage Ratio (Worst Lane)	0.00			
Total Effective Stops	8	veh/h	9	pers/h
Effective Stop Rate	0.02	per veh	0.02	per pers
Proportion Queued	0.01		0.01	
Performance Index	5.4		5.4	
Cost (Total)	168.45	$/h	168.45	$/h
Fuel Consumption (Total)	54.8	L/h		
Carbon Dioxide (Total)	133.4	kg/h		
Hydrocarbons (Total)	0.011	kg/h		
Carbon Monoxide (Total)	0.213	kg/h		
NOx (Total)	0.521	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	225,347	veh/y	270,417	pers/y
Delay	11	veh-h/y	13	pers-h/y
Effective Stops	3,706	veh/y	4,447	pers/y
Travel Distance	224,969	veh-km/y	269,962	pers-km/y
Travel Time	2,541	veh-h/y	3,049	pers-h/y
Cost	80,854	$/y	80,854	$/y
Fuel Consumption	26,285	L/y		
Carbon Dioxide	64,050	kg/y		
Hydrocarbons	5	kg/y		
Carbon Monoxide	102	kg/y		
NOx	250	kg/y		

OD MOVEMENT DEMAND FLOWS

Site Origin - Destination Movement Demand Flow Rates (veh/h) and Pedestrian Flow Rates (ped/h)

Site: Site2 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 3pm Peak
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

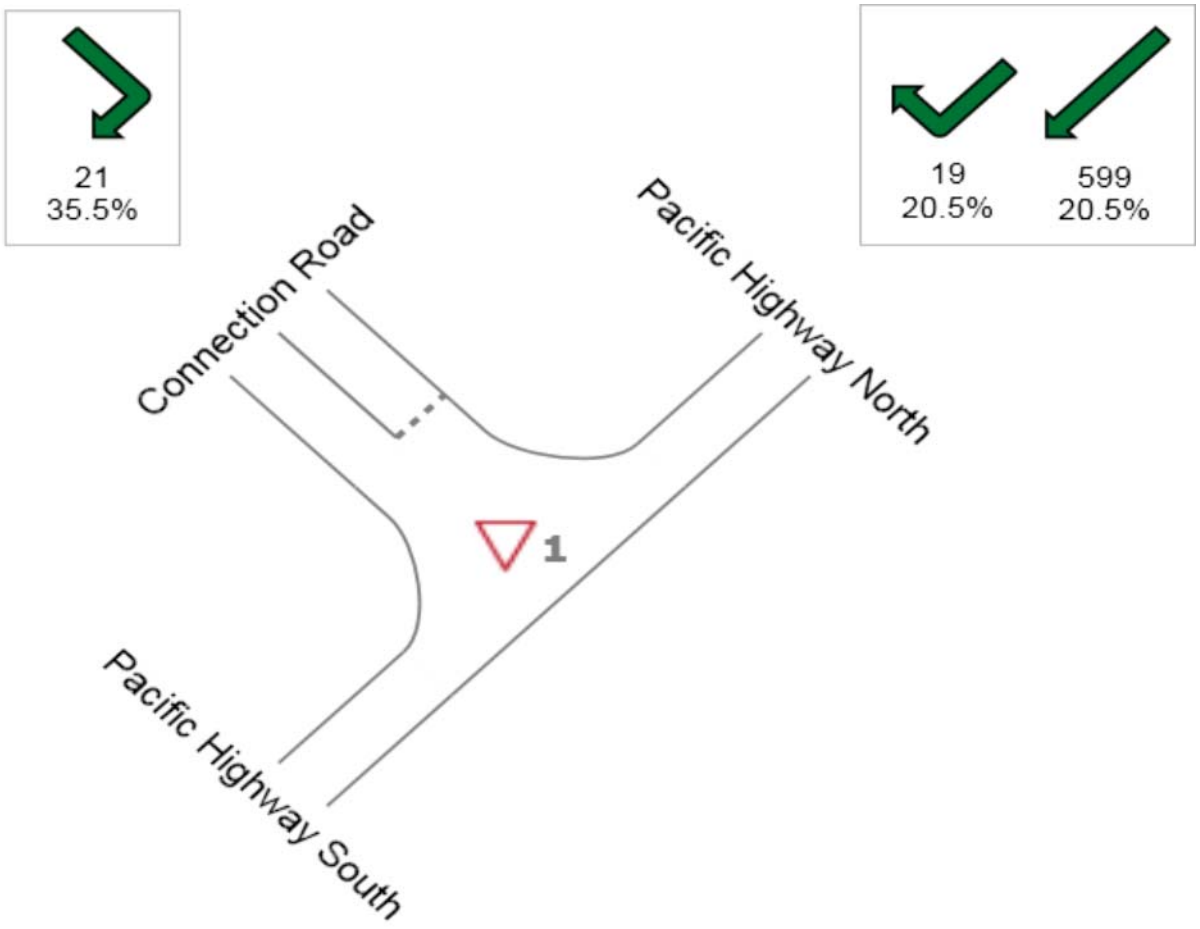
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 639

Light Vehicles (LV): 505

Heavy Vehicles (HV): 134



INTERSECTION SUMMARY

Site: Site2 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 3pm Peak
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	85.8	km/h	85.8	km/h
Travel Distance (Total)	627.7	veh-km/h	753.3	pers-km/h
Travel Time (Total)	7.3	veh-h/h	8.8	pers-h/h
Demand Flows (Total)	639	veh/h	767	pers/h
Percent Heavy Vehicles (Demand)	21.0	%		
Degree of Saturation	0.173			
Practical Spare Capacity	466.1	%		
Effective Intersection Capacity	3691	veh/h		
Control Delay (Total)	0.09	veh-h/h	0.11	pers-h/h
Control Delay (Average)	0.5	sec	0.5	sec
Control Delay (Worst Lane)	8.7	sec		
Control Delay (Worst Movement)	8.7	sec	8.7	sec
Geometric Delay (Average)	0.3	sec		
Stop-Line Delay (Average)	0.2	sec		
Idling Time (Average)	0.1	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.2	veh		
95% Back of Queue - Distance (Worst Lane)	1.5	m		
Queue Storage Ratio (Worst Lane)	0.01			
Total Effective Stops	28	veh/h	34	pers/h
Effective Stop Rate	0.04	per veh	0.04	per pers
Proportion Queued	0.02		0.02	
Performance Index	7.6		7.6	
Cost (Total)	237.01	$/h	237.01	$/h
Fuel Consumption (Total)	76.2	L/h		
Carbon Dioxide (Total)	185.8	kg/h		
Hydrocarbons (Total)	0.016	kg/h		
Carbon Monoxide (Total)	0.289	kg/h		
NOx (Total)	0.751	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	306,695	veh/y	368,034	pers/y
Delay	44	veh-h/y	53	pers-h/y
Effective Stops	13,565	veh/y	16,278	pers/y
Travel Distance	301,304	veh-km/y	361,565	pers-km/y
Travel Time	3,511	veh-h/y	4,213	pers-h/y
Cost	113,763	$/y	113,763	$/y
Fuel Consumption	36,565	L/y		
Carbon Dioxide	89,195	kg/y		
Hydrocarbons	8	kg/y		
Carbon Monoxide	139	kg/y		
NOx	360	kg/y		

LANE SUMMARY

Site: Site2 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 3pm Peak
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. %
NorthEast: Pacific Highway North													
Lane 1	299	20.5	1730	0.173	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	299	20.5	1730	0.173	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	19	20.5	1629	0.012	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	618	20.5		0.173		0.3	NA	0.0	0.0				
NorthWest: Connection Road													
Lane 1	21	35.5	457	0.046	100	8.7	LOS A	0.2	1.5	Full	55	0.0	0.0
Approach	21	35.5		0.046		8.7	LOS A	0.2	1.5				
Intersection	639	21.0		0.173		0.5	NA	0.2	1.5				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site2 - 2025 3pm Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 3pm Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
NorthEast: Pacific Highway North											
8	T1	599	20.5	0.173	0.0	LOS A	0.0	0.0	0.00	0.00	89.9
9	R2	19	20.5	0.012	7.6	LOS A	0.0	0.0	0.00	0.69	37.4
Approach		618	20.5	0.173	0.3	NA	0.0	0.0	0.00	0.02	87.8
NorthWest: Connection Road											
12	R2	21	35.5	0.046	8.7	LOS A	0.2	1.5	0.61	0.73	39.8
Approach		21	35.5	0.046	8.7	LOS A	0.2	1.5	0.61	0.73	39.8
All Vehicles		639	21.0	0.173	0.5	NA	0.2	1.5	0.02	0.04	85.8

Level of Service (LOS) Method: Delay (RTA NSW).
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.

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Site2 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 9am Peak
Giveway / Yield (Two-Way)

Volume Display Method: Total and %

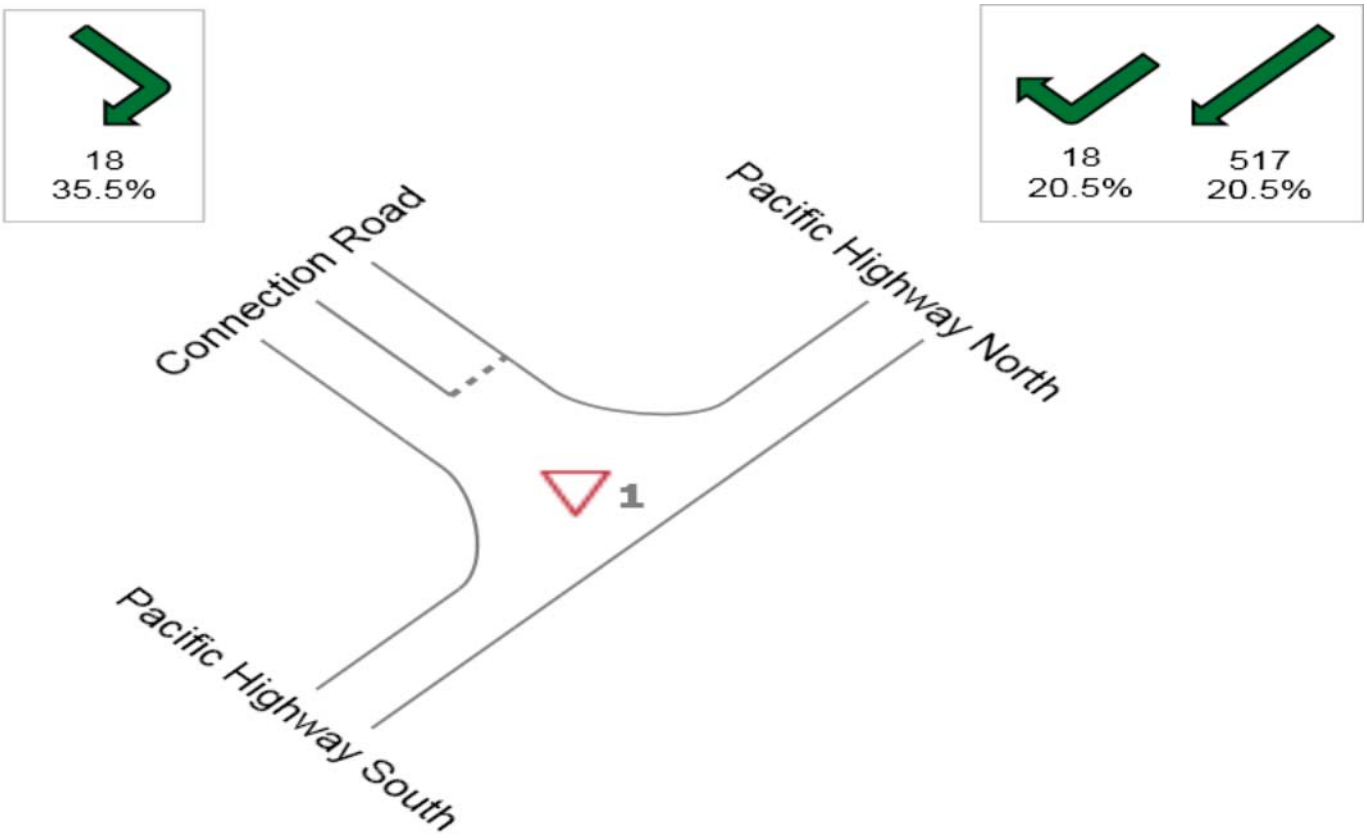
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 553

Light Vehicles (LV): 437

Heavy Vehicles (HV): 116



INTERSECTION SUMMARY

Site: Site2 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 9am Peak
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	65.1	km/h	65.1	km/h
Travel Distance (Total)	571.2	veh-km/h	685.5	pers-km/h
Travel Time (Total)	8.8	veh-h/h	10.5	pers-h/h
Demand Flows (Total)	582	veh/h	699	pers/h
Percent Heavy Vehicles (Demand)	21.0	%		
Degree of Saturation	0.157			
Practical Spare Capacity	523.0	%		
Effective Intersection Capacity	3701	veh/h		
Control Delay (Total)	1.01	veh-h/h	1.21	pers-h/h
Control Delay (Average)	6.3	sec	6.3	sec
Control Delay (Worst Lane)	7.9	sec		
Control Delay (Worst Movement)	7.9	sec	7.9	sec
Geometric Delay (Average)	6.1	sec		
Stop-Line Delay (Average)	0.2	sec		
Idling Time (Average)	0.1	sec		
Intersection Level of Service (LOS)	NA			
95% Back of Queue - Vehicles (Worst Lane)	0.1	veh		
95% Back of Queue - Distance (Worst Lane)	1.2	m		
Queue Storage Ratio (Worst Lane)	0.01			
Total Effective Stops	358	veh/h	429	pers/h
Effective Stop Rate	0.61	per veh	0.61	per pers
Proportion Queued	0.02		0.02	
Performance Index	9.7		9.7	
Cost (Total)	405.30	$/h	405.30	$/h
Fuel Consumption (Total)	110.1	L/h		
Carbon Dioxide (Total)	267.2	kg/h		
Hydrocarbons (Total)	0.023	kg/h		
Carbon Monoxide (Total)	0.346	kg/h		
NOx (Total)	1.187	kg/h		

Level of Service (LOS) Method: Delay (RTA NSW).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection 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.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	279,410	veh/y	335,293	pers/y
Delay	486	veh-h/y	583	pers-h/y
Effective Stops	171,696	veh/y	206,036	pers/y
Travel Distance	274,189	veh-km/y	329,026	pers-km/y
Travel Time	4,214	veh-h/y	5,057	pers-h/y
Cost	194,542	$/y	194,542	$/y
Fuel Consumption	52,834	L/y		
Carbon Dioxide	128,263	kg/y		
Hydrocarbons	11	kg/y		
Carbon Monoxide	166	kg/y		
NOx	570	kg/y		

LANE SUMMARY

Site: Site2 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 9am Peak
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. %
NorthEast: Pacific Highway North													
Lane 1	272	20.5	1730	0.157	100	6.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	272	20.5	1730	0.157	100	6.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	19	20.5	1629	0.012	100	7.6	LOS A	0.0	0.0	Short	150	0.0	NA
Approach	563	20.5		0.157		6.2	NA	0.0	0.0				
NorthWest: Connection Road													
Lane 1	19	35.5	501	0.038	100	7.9	LOS A	0.1	1.2	Full	55	0.0	0.0
Approach	19	35.5		0.038		7.9	LOS A	0.1	1.2				
Intersection	582	21.0		0.157		6.3	NA	0.1	1.2				

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

Site: Site2 - 2025 9am Peak

Possum Brush Road & Pacific Highway Intersection - Southbound 2025 9am Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
NorthEast: Pacific Highway North											
8	T1	544	20.5	0.157	6.2	LOS A	0.0	0.0	0.00	0.61	66.5
9	R2	19	20.5	0.012	7.6	LOS A	0.0	0.0	0.00	0.69	43.9
Approach		563	20.5	0.157	6.2	NA	0.0	0.0	0.00	0.61	65.8
NorthWest: Connection Road											
12	R2	19	35.5	0.038	7.9	LOS A	0.1	1.2	0.57	0.68	40.4
Approach		19	35.5	0.038	7.9	LOS A	0.1	1.2	0.57	0.68	40.4
All Vehicles		582	21.0	0.157	6.3	NA	0.1	1.2	0.02	0.61	65.1

Level of Service (LOS) Method: Delay (RTA NSW).
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.

ANNEXURE D

Pacific Highway Upgrade – Failford Road to Tritton Road

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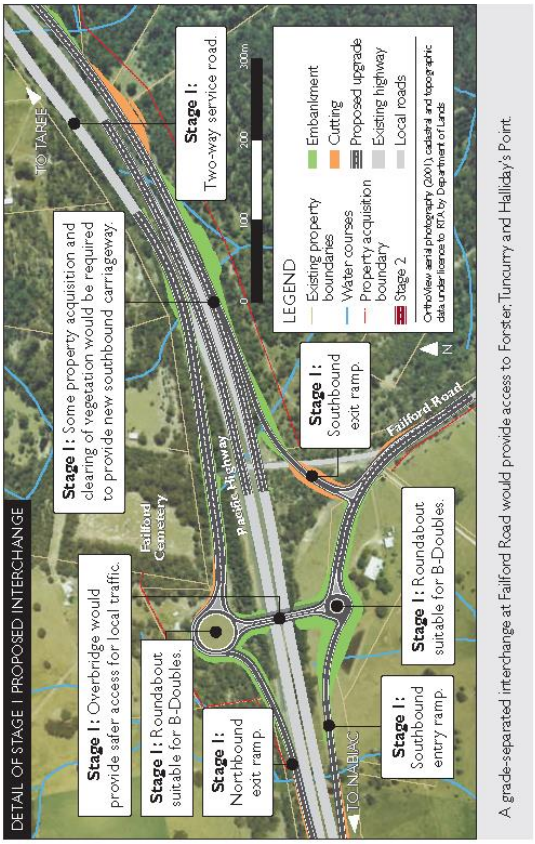
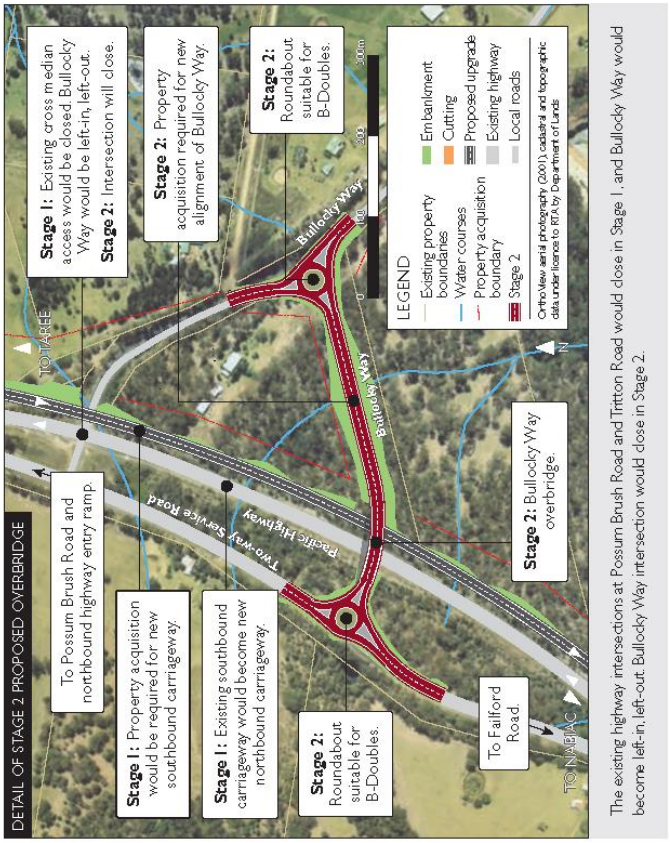
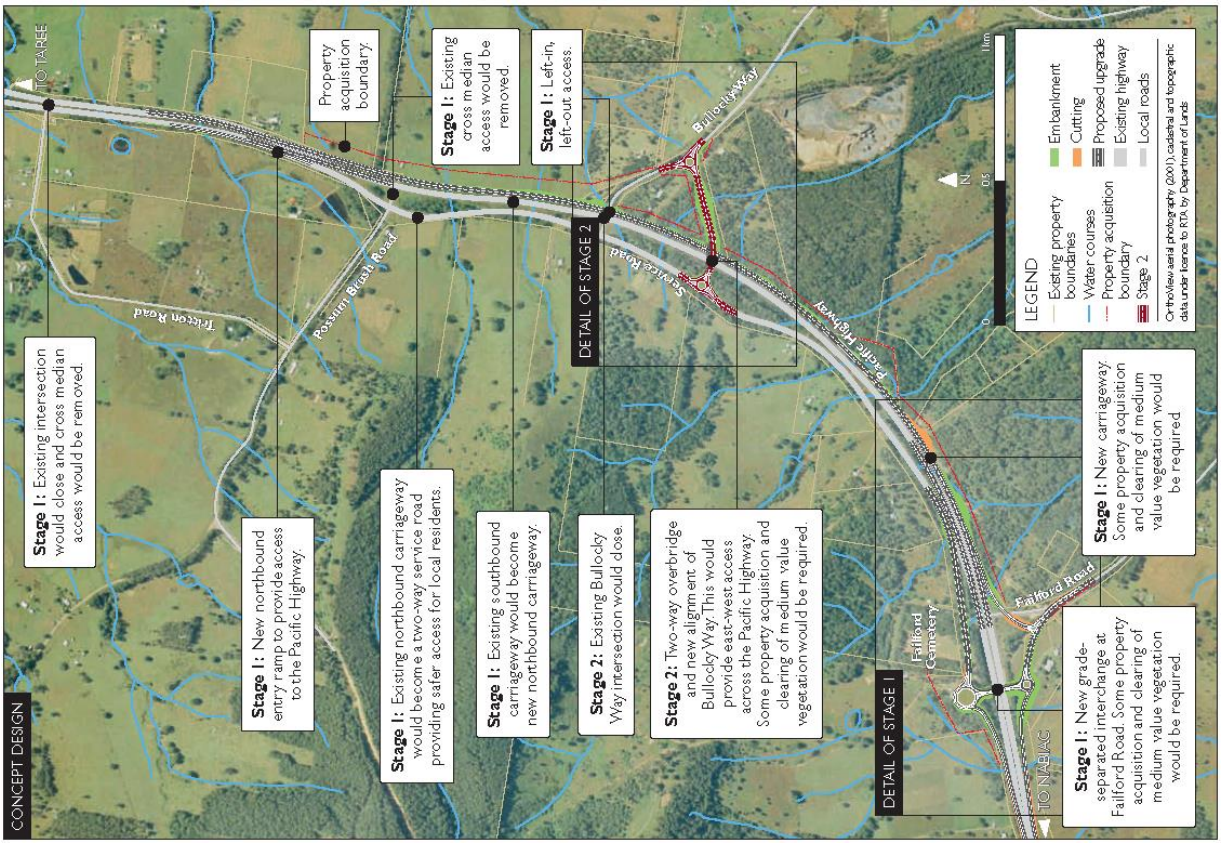

DETAIL OF STAGE 1 PROPOSED INTERCHANGE
TO TAREE
Stage 1: Two-way service road.
Stage 1: Some property acquisition and clearing of vegetation would be required to provide new southbound carriageway.
Stage 1: Overbridge would provide safer access for local traffic.
Stage 1: Roundabout suitable for B-Doubles.
Stage 1: Northbound exit ramp.
Stage 1: Southbound entry ramp.
Stage 1: Roundabout suitable for B-Doubles.
Stage 1: Southbound exit ramp.
Failford Cemetery
Pacific Highway
Failford Road
TO NABIAC
LEGEND
Existing property boundaries
Water courses
Property acquisition boundary
Stage 2
Embankment
Cutting
Proposed upgrade
Existing highway
Local roads
OrthoView aerial photography (2001), cadastral and topographic data under licence to RTA by Department of Lands
A grade-separated interchange at Failford Road would provide access to Forster, Tuncurry and Halliday's Point.


DETAIL OF STAGE 2 PROPOSED OVERBRIDGE
TO TAREE
Stage 1: Existing cross median access would be closed. Bullocky Way would be left-in, left-out.
Stage 2: Intersection will close.
Stage 2: Property acquisition required for new alignment of Bullocky Way.
Stage 2: Roundabout suitable for B-Doubles.
To Possum Brush Road and northbound highway entry ramp.
Stage 1: Property acquisition would be required for new southbound carriageway.
Stage 1: Existing southbound carriageway would become new northbound carriageway.
Stage 2: Roundabout suitable for B-Doubles.
Two-way Service Road
Pacific Highway
Bullocky Way
Stage 2: Bullocky Way overbridge.
To Failford Road.
TO NABIAC
LEGEND
Existing property boundaries
Water courses
Property acquisition boundary
Stage 2
Embankment
Cutting
Proposed upgrade
Existing highway
Local roads
OrthoView aerial photography (2001), cadastral and topographic data under licence to RTA by Department of Lands
The existing highway intersections at Possum Brush Road and Tritton Road would close in Stage 1, and Bullocky Way would become left-in, left-out. Bullocky Way intersection would close in Stage 2.


CONCEPT DESIGN
TO TAREE
Stage 1: Existing intersection would close and cross median access would be removed.
Stage 1: New northbound entry ramp to provide access to the Pacific Highway.
Stage 1: Existing northbound carriageway would become a two-way service road providing safer access for local residents.
Stage 1: Existing southbound carriageway would become new northbound carriageway.
Stage 2: Existing Bullocky Way intersection would close.
Stage 2: Two-way overbridge and new alignment of Bullocky Way. This would provide east-west access across the Pacific Highway. Some property acquisition and clearing of medium value vegetation would be required.
Property acquisition boundary.
Stage 1: Existing cross median access would be removed.
Stage 1: Left-in, left-out access.
Tritton Road
Possum Brush Road
DETAIL OF STAGE 2
Bullocky Way
Service Road
Pacific Highway
Stage 1: New carriageway. Some property acquisition and clearing of medium value vegetation would be required.
DETAIL OF STAGE 1
Failford Cemetery
Failford Road
TO NABIAC
Stage 1: New grade-separated interchange at Failford Road. Some property acquisition and clearing of medium value vegetation would be required.
LEGEND
Existing property boundaries
Water courses
Property acquisition boundary
Stage 2
Embankment
Cutting
Proposed upgrade
Existing highway
Local roads
OrthoView aerial photography (2001), cadastral and topographic data under licence to RTA by Department of Lands

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