Appendix J

Transport assessment

Gunlake Quarry Extension Project

Transport Assessment

Prepared for Gunlake Quarry Pty Ltd | 10 February 2016

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Gunlake Quarry Extension Project

Final

Report J14119RP1 | Prepared for Gunlake Quarry Pty Ltd | 10 February 2016

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1 Introduction

1.1 Overview

Gunlake Quarry is a hard rock quarry operated by Gunlake Quarries Pty Limited (Gunlake). It is located approximately 7 kilometres (km) north-west of Marulan in the Goulburn Mulwaree local government area (LGA), approximately 160 km south-west of Sydney (Figure 1.1).

Gunlake Quarry has been operating since 2009 and is proposing to expand its operations. The quarry produces material suitable for use in a wide range of applications, including concrete and sealing aggregates, rail ballast, manufactured sand and road base.

These products are used by Gunlake for concrete production in its own operations in Sydney as well as for other markets. Gunlake is in the process of establishing concrete plants in the Sydney region and has three plants currently in operation at Smeaton Grange, Glendenning and Silverwater.

1.2 Approval process

This transport assessment (TA) has been prepared for the development application and accompanying environmental impact statement (EIS) for the proposed quarry extension.

Gunlake Quarry currently operates under Project Approval 07-0074 (the project approval), issued by the Minister for Planning in September 2008, under Part 3A of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (EP&A Act).

This original approval included approval for daily truck movements equivalent to about 500,000 tonnes per annum of saleable product until 2038.

Three modifications have been approved:

- Modification 1 – Stage 2 southbound access;
- Modification 2 – quarry expansion; and
- Modification 3 – truck movements.

Modifications 1 and 3 were minor modifications to alter the transport routes and daily truck numbers related to the quarry. Modification 2 included expansion of the quarry pit and overburden emplacement, an increase to the daily truck movements for 750,000 tonnes per annum production and alteration of the approved hours of operation.

The Gunlake Quarry Extension Project (the project) seeks to enable an increased rate of extraction at Gunlake Quarry to assist to meet the identified demand for construction materials, including quarried aggregate, in the local area and Sydney. The Department of Planning and Environment (DPE) has determined that Marulan is a suitable area for the future supply of heavy construction materials for Sydney. The proposed layout for the quarry extension is included in Appendix A.

The proposal will be State significant development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 and an application will be lodged under Division 4.1 of Part 4 of the EP&A Act.

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Regional location and transport routes to Sydney

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Transport Assessment
Figure 1.1

1.3 Secretary's environmental assessment requirements

This TA has been prepared to address specific requirements provided in the Secretary's environmental assessment requirements (SEARs) issued on 3 July 2015 (Table 1.1).

Table 1.1 Relevant SEARs

Requirement	Section addressed
Accurate predictions of the road traffic generated by the construction and operation of the development, including cumulative traffic levels associated with Johnniefelds Quarry to the east and Lynwood Quarry to the South.	Section 3.5.1 , Section 3.5.2 and Figure 4.1
A description of the types and maximum numbers of vehicles likely to be used for transportation of quarry products, the public roads in the Goulburn Mulwaree LGA likely to be used and the times during which those roads would be used.	Section 3.3, Section 3.5.1 , Section 3.5.2 and Figure 4.1
A detailed assessment of potential traffic impacts on the capacity, condition, safety and efficiency of the local and State road network (as identified above), having regard to the requirements of the Goulburn Mulwaree Council and RMS (see Table 1.2).	Chapter 4 and Chapter 5
A detailed description of the measures or works (including concept plans) that would be used and/or implemented to upgrade, maintain and improve the capacity, efficiency and safety of the road network used by the development.	Chapter 6

Relevant agency requirements from the Goulburn Mulwaree Council (the Council) and Roads and Maritime Services (RMS) which have also informed the SEARs are also addressed in the TA (Table 1.2).

Table 1.2 Relevant agency requirements for this assessment

Requirement	Section addressed
Roads and Maritime Services (RMS)	
The total impact of existing and proposed development traffic on the state road network with consideration for a 10 year horizon.	Chapter 5
The volume and distribution of traffic generated by the proposed development, including the maximum daily peak movements generated by periodic haulage campaigns.	Chapter 4
Intersection sight distances at key intersections along the primary haul route.	Intersection descriptions and photographs in Section 2.6 and the haulage route photographs in Appendix B
Existing and proposed access conditions.	There is no change to the proposed Gunlake Quarry access location from Brayton Road
Details of improvements for road intersections along the identified haulage route/s in accordance with Austroads Guidelines.	Chapter 6 based on the analysis which is presented in Chapter 4 and Chapter 5
Detail of staff, servicing and parking arrangements.	Site layout in Appendix A and Chapter 3
Traffic Management for construction and operational phases of the development.	Section 4.4 and Section 6.2
Impact on public transport (public and school bus routes) and consideration for alternative transport modes such as cyclists and pedestrians.	Sections 2.7, Section 2.8, Section 4.7, Section 4.8 and Chapter 6

Table 1.2 Relevant agency requirements for this assessment

Requirement	Section addressed
Impacts of road traffic noise and dust generation along the identified haulage route.	In the noise acoustic and air quality impact reports for the project.
Details of any proposed Road Maintenance Contributions Plan.	Section 4.5
Consideration for Clause 16 of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* regarding: • Impact on school zones and residential areas; • Truck Management Plan; • Code of Conduct for Haulage operators; and • Road Safety Assessment of key haulage routes.	Section 2.7 and Section 4.4
Goulburn Mulwaree Council[1]	
An assessment regarding the amenity impacts that such a significant increase in traffic movements will have on all residences along the proposed haulage routes.	Chapter 4, Chapter 5 and noise impact assessment.
Careful consideration to the feasibility of rail transport.	A rail transport feasibility assessment has been undertaken which is summarised in Section 3.4 and detailed in Appendix E.
The Traffic and Transport Impact Assessment should consider the current requirements for haulage routes in the Goulburn Mulwaree Development Control Plan 2009 including: • in rural areas – 7 m wide sealed carriageways, plus 1 m wide shoulders with 500 mm seal; • 80 km/h design standard; • 8 m wide culverts and bridges (ie from barrier to barrier); • asphaltic concrete surface in village areas; and • intersection upgrades, where appropriate.	The assessment has been undertaken in accordance with these requirements and also in accordance of the road design requirements for rural roads which are contained in the Austroads Road Design Guide 2010.
The proposal includes a large increase in the number of daily heavy vehicle movements (from 164 to 440) and the controls within Council's Section 94 development contributions plan and Development Control Plan 2009 were not drafted in anticipation of such a large operation. Council is seeking provision of: • a culvert and bridge width of 9 m; • shoulder widths increased to 2 m wide each, with 1 m being sealed; and • centrelines and edge lines to be provided.	The future road width design requirements for the haulage route have been determined in accordance with the Austroads Road Design Guide 2010.
Intersection upgrades may include channelisation at Brayton Road/Ambrose Road and possibly one other intersection on Brayton Road.	The intersection at the junction of Brayton Road with the Bypass Road, which is the major intersection on Brayton Road, already has a concrete channelisation island. There is no other location on the 'haulage route' where a channelisation island would be required as a result of truck traffic movements turning at intersections.

[1] The Council's positions regarding road maintenance and upgrades and the actions to address these are provided in Table 7.1.

1.4 Transport assessment methodology

This report addresses the road transport related SEARs, including consideration of the *RTA Guide to Traffic Generating Developments* (RTA 2002) and current road and intersection design standards in the *Road Design Guide* (Austroads 2010).It incorporates the findings of the following transport investigations:

- a tube traffic count program undertaken in August 2015 at five locations in the Marulan area including three locations on Brayton Road, the Gunlake Quarry access road and the Bypass Road route which combined sections of two existing local roads, Jooramin Road and Red Hills Road;
- peak hourly traffic counts at the intersections of Red Hills Road and the Hume Highway, and Brayton Road and George Street on Tuesday 18 August 2015;
- RMS annual average daily traffic (AADT) traffic counts for the Hume Highway for 2005 and 2012;
- a visual inspection and photographic survey of the local quarry product haulage routes, undertaken by EMM on 4 September 2015;
- direct observations of truck travel times on the local haulage route between the Gunlake Quarry access road and the Hume Highway via Brayton Road and the Bypass Road, and the typical waiting times for the Gunlake Quarry trucks when turning onto the Hume Highway at Red Hills Road during busy northbound traffic flow conditions on the afternoon on Friday 4 September 2015; and
- recent inspections and previous road pavement maintenance investigations for the haulage route, which have been undertaken since 2011 including the construction by Gunlake of improvements to the Brayton Road and Bypass Road routes and the determination of the current quarry products section 94 contributions plan rate.

This TA also considers the feasibility of rail transport of Gunlake Quarry products, particularly to the Gunlake Concrete Plant locations at Smeaton Grange, Glendenning, Silverwater, Banksmeadow and Prestons (proposed).

The Project operational stage road pavement impacts have been developed in consultation with the Council, where a Section 94 development contributions plan is already in place. Gunlake pays a $ per tonne which funds the ongoing road maintenance works for the affected sections of both Brayton Road and the Bypass Road.

The cumulative traffic impacts from the Gunlake Quarry and the nearby Holcim Johnniefelds Quarry are reflected in the short term traffic impact assessment for the current year (2015).

In the long term, cumulative traffic impacts from the operation of the two quarries on the primary haulage route via Brayton Road, Bypass Road and Red Hills Road would be limited as the Johnniefelds Quarry is scheduled to close in the near future and be replaced by the Holcim Lynwood Quarry when it commences operations. This scenario is reflected in the traffic impact assessment which is undertaken for (2025) where the potential cumulative impacts of the Gunlake Quarry and Lynwood Quarry is assessed in combination with the background traffic growth over a ten year future period for the Hume Highway.

In this assessment, the current road and intersection traffic conditions are reviewed for the terms of the potential traffic capacity, level of service, traffic safety and road pavement maintenance impacts from the project traffic during both the short term and long term operational traffic phases.

Minimal construction stage activities and traffic movements for the project are anticipated as the existing quarry infrastructure for product crushing and grading and the quarry truck loading facilities are generally adequate for the proposed increase in the annual quarry production rate.

2 Existing road and traffic conditions

2.1 The locality

The main urban centres near the Project area are at Marulan (1,400 persons) and Goulburn (22,000 persons). A number of smaller rural townships and settlements are located the west and north of the Project area. These include Brayton and Towrang within the Goulburn Mulwaree LGA and other more distant rural settlements such as Big Hill, within the adjoining Upper Lachlan LGA.

The Hume Highway connects the Marulan area to Goulburn, Canberra (via the Federal Highway) and most other major population centres along the route between Sydney and Melbourne. To the north, the Hume Highway links Marulan with the four main Southern Highlands townships (Moss Vale, Bowral, Mittagong and Berrima) and then continues towards south-western Sydney and the M5 and M7 orbital motorways. Traffic can diverge towards the Illawarra and South Coast Regions via the Illawarra Highway or Picton Road routes which intersect with the Hume Highway near Sutton Forest and Wilton (Figure 1.1).

2.2 Existing road network

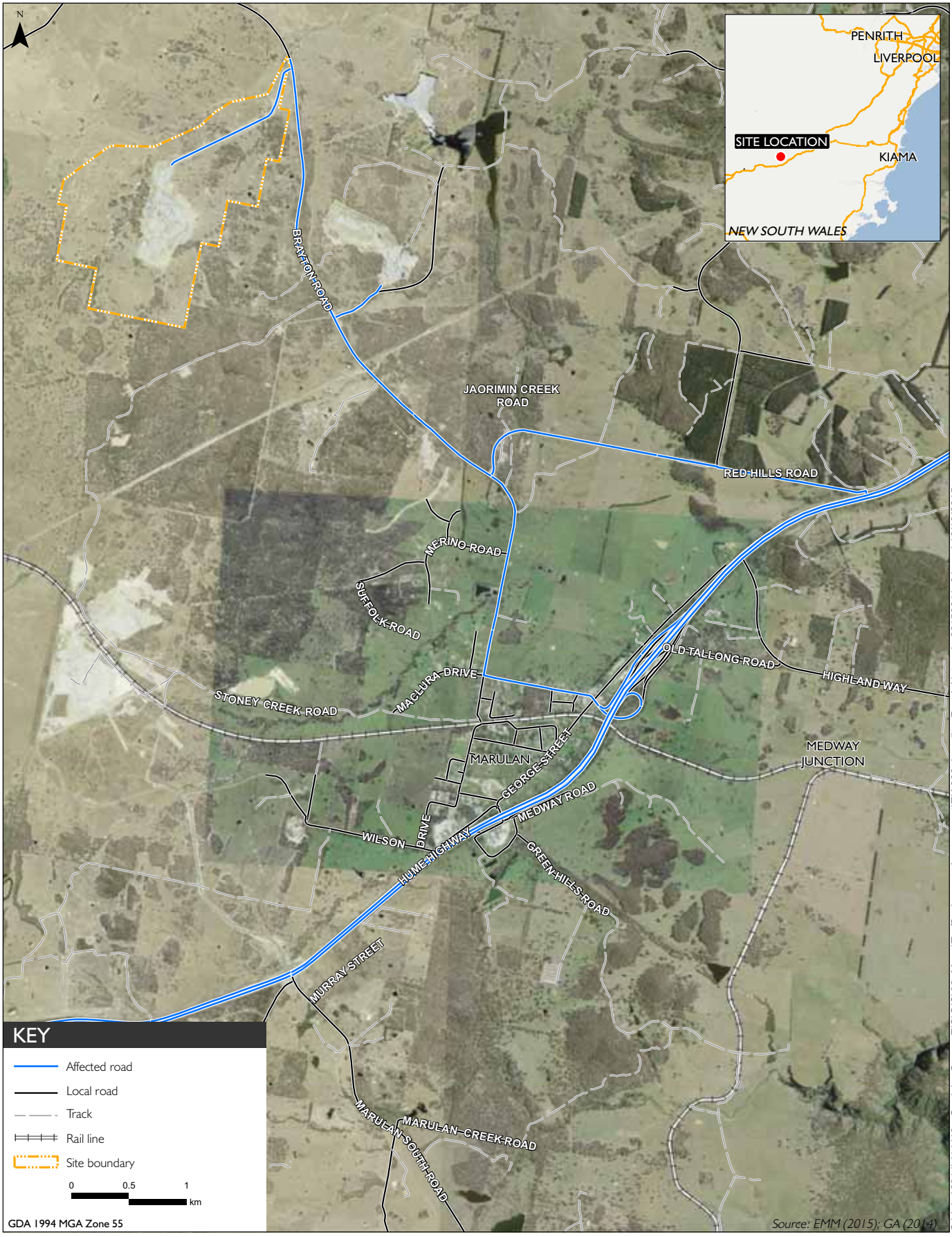
A detailed description of the road network that would be used by quarry traffic when travelling to, from, and within the Marulan area is provided in the following sections. A selection of photographs showing the existing typical route construction, the width of traffic lanes and line-marking for the local roads are included in Appendix B.

2.2.1 Hume Highway

The Hume Highway is classified as a State Highway and is under RMS jurisdiction. The road is an approved B-Double route with two traffic lanes in each direction, south of the Sydney Metropolitan area boundary which is near Narellan Road. North of Narellan Road, the Hume Highway has at least one or two additional traffic lanes in each direction to accommodate the additional outer Sydney suburban traffic movements.

To the north of the Medway Road and Mereworth Road interchanges near Berrima about XX km north of the Red Hills Road intersection, the Hume Highway has been constructed to current Motorway construction standards which allow grade separated intersection access only. To the south of Mereworth Road, at-grade access is still permitted at numerous local access intersections including at (Red Hills Bypass Road) north of Marulan. Most of these local access intersections, where the minor road traffic volumes are still low, permitting right and left turn access. However at Red Hills Road, the right turn access has recently been closed as part of the Stage 2 project conditions.

To the south of Marulan, a grade separated access intersection has recently been constructed at South Marulan Road. This provides grade separated access to the Hume Highway for the regionally-based quarry truck movements from the Boral and Holcim quarries south of Marulan. The existing development conditions of approval, as modified, specify that all the trucks travelling to the quarry must travel via Red Hills Road (the Bypass Road route). Therefore, trucks returning from north must continue south to the South Marulan Road interchange, turn around there and to travel north to Red Hills Road.



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Existing road network

Gunlake Quarry
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Figure 2.1

The Hume Highway has a speed limit of 110 km/hr south of the Sydney Metropolitan area. In the Sydney metropolitan area, the speed limit decreases to 100 km/hr where the route merges with the M5 and M7 Motorways.

2.2.2 Brayton Road

Brayton Road is classified as a local collector road and is under Council jurisdiction. It runs from George Street in Marulan to Brayton (approximately 10 km). It also connects, via other roads, to a number of local settlements and townships further to the west and north, on the routes towards Taralga and Crookwell.

All the rural sections of Brayton Road are two lanes wide. Many of the recently treated sections now have centre line markings. The typical road width and current condition of all the local sections of Brayton Road are shown in Appendix B.

There is a 1 km urban section of Brayton Road within the Marulan township which has an urban type road cross-section with concrete kerb and gutter on both sides of the road for the majority of the length.

The 1.7 km long section of the Brayton Road between Johnniefelds Quarry and Bypass Road has recently been upgraded and reconstructed by the Council. The road generally has centre lines and edge lines are proposed to be added in the near future. The road generally has two 3.5 m-wide travel lanes with two 1-m wide sealed shoulders and two 1-m wide gravel shoulders for an overall formation of 11 m.

Additional recent resurfacing work has also been undertaken on other rural sections of Brayton Road east of the Bypass Road intersection towards the Marulan township.

The normal rural speed limit of 100 km/hr applies to most sections of Brayton Road. The road is an approved B-Double route, and has a 50 km/hr speed limit within the Marulan urban area.

2.2.3 Bypass Road

Bypass Road links Brayton Road with Red Hills Road and the distance to the Hume Highway is approximately 3.6 km from the Brayton Road intersection.

The Bypass Road, which was completed in 2012, carries the majority of the existing truck traffic from both the Gunlake Quarry and the Johnniefelds Quarry. The road is also an approved B-Double route and is generally subject to a speed limit of 100 km/hr.

The road carriageway generally has two lanes with marked centre lines which define overtaking opportunities. The road has some steeper sections towards the eastern end, where the road crosses a ridge approximately 1 km west of the Hume Highway.

2.2.4 George Street

George Street is the main urban street of Marulan and has an intersection with Brayton Road near its northern end. This provides the main Marulan access to and from the Hume Highway for both northbound and southbound traffic. There is a grade separated interchange which also incorporates the access ramps to and from the Hume Highway for the RMS Marulan Heavy Vehicle Testing Station.

Most sections of George Street are not generally used by either Gunlake Quarry or Johnniefelds Quarry trucks traffic except at the intersection with Brayton Road, where the southbound outbound quarry truck traffic from both these quarries cross George Street on its way to the Hume Highway.

2.2.5 South Marulan Road

At South Marulan Road, which is approximately 3 km south of Brayton Road at Marulan, there is a grade separated interchange which provides access to South Marulan Road and Jerrara Road, as well as to a Boral Quarry (Limestone Mine) and the Holcim Lynwood Quarry which will soon be commencing its operations.

The interchange overpass and the intersections on both the western and eastern sides of the Hume Highway at South Marulan Road are used by all the inbound truck traffic returning from the north to the Gunlake Quarry. This traffic makes a U-turn at the South Marulan Road interchange on the Hume Highway and uses the Redhills Road/Bypass Road route north of Marulan to avoid travelling through urban areas of Marulan.

2.3 Existing traffic conditions

2.3.1 Traffic characteristics

On the Brayton Road and the Bypass Road route, approximately half of all the existing traffic is quarry truck traffic from either Gunlake Quarry or Johnniefelds Quarry. Other traffic is primarily local or farm traffic with minimal tourist traffic or other types of traffic.

School buses travel along Bypass Road and Brayton Road in both directions each weekday, in the vicinity of the two quarries. The school buses drop off and collect school children on the part of Brayton Road used by quarry trucks. As part of the recent upgrade of Brayton Road, four safe school bus collection/drop off points have been built to accommodate this activity.

On the Hume Highway outside the Sydney metropolitan area, the route carries high proportions of heavy vehicle traffic, which are typically between 15% and 18% of all traffic. The Hume Highway truck traffic includes many long distance and interstate freight vehicles which comprise large B-Double type trucks with up to nine axles per vehicle.

2.3.2 Existing traffic volumes

The existing daily and peak hour traffic volumes on the major and local roads considered in this TA have been determined from a recent program of intersection and tube traffic counts and the AADT data from RMS traffic surveys. The project-specific traffic data is included in Appendix C and Appendix D.

The daily traffic volumes for all the roads surveyed, including the recorded or estimated daily heavy vehicle movements, are listed in Table 2.1. The locations of each of the local road traffic surveys are shown in Figure 2.2. During the week of the local road traffic surveys which were undertaken during August 2015, the Gunlake Quarry was operating at a weekly production rate equivalent to the currently approved maximum annual production rate of 750,000 tonnes.

RMS traffic counts for the Hume Highway for the years 2005 and 2012 are included in Table 2.1. The most recent (2012) RMS traffic surveys indicate that the recent traffic growth rates for the Hume Highway for the sections north of Marulan have been about +2% annually since 2005.

On the Hume Highway, north of Red Hills Road, the six-hour intersection traffic count recorded the proportion of heavy vehicles as 18% of all traffic. This included many large B-Double type trucks with up to nine axles per vehicle, further to the north in the Mittagong and Pheasants Nest areas, the proportions of heavy vehicles, based on peak hour traffic observations, are in the range 15% to 20%.

On the two quarry access roads to Gunlake and Johnniefelds Quarries and the haulage route sections of Brayton Road and the Bypass Road Red Hills Road, there are relatively high proportions of heavy vehicle traffic (between 45 and 71% of all traffic).

On the other sections of Brayton Road, west of Gunlake Quarry and east of the Bypass Road intersection, the volumes and proportions of heavy vehicle traffic are generally much lower, between 16 and 22% of all traffic.

Table 2.1 Existing average weekday and AADT traffic volumes and heavy vehicle proportions

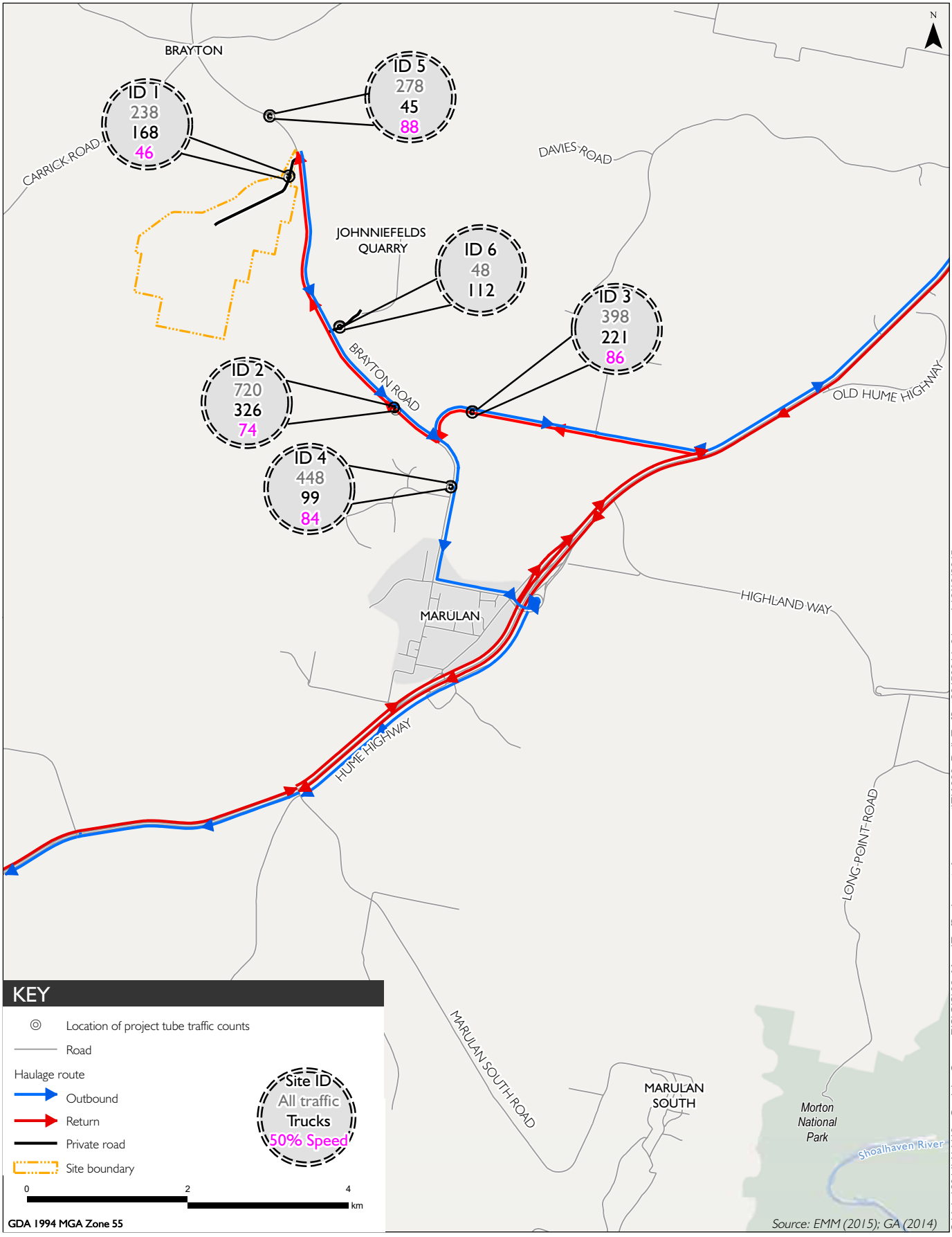
Road name	Survey year	Average daily traffic		Proportion of heavy vehicles (%)
		Total – all vehicles	Heavy vehicles	
Hume Highway Penrose south of Illawarra Highway	2005	20,029	3,605	18%
(RMS AADT Surveys)	(2012)	(21,300)	(3,835)	(18%)
Hume Highway Mittagong Bypass north of Old Hume Hwy	2005	16,969	3.395	20%
(RMS AADT Surveys)	(2012)	(19,700)	(3,940)	(20%)
Hume Highway Pheasants Nest south of Picton Road	2005	29,660	4,450	15%
(RMS AADT Surveys)	(2012)	(34,000)	(5,100)	(15%)
Brayton Road (west of Gunlake Quarry)	2015	278	45	16%
Brayton Road (west of Bypass Road)	2015	720	326	45%
Brayton Road (east of Bypass Road)	2015	448	99	22%
Bypass Road (north of Brayton Road)	2015	398	221	56%
Gunlake Quarry access road	2015	238	168	71%
Johnniefelds Quarry access road*	2015	160	112	70%

Notes: **The proportion of heavy vehicles for the Hume Highway was determined from the 6 hour period of the Bypass Road intersection traffic survey. The daily traffic volume for Johnniefelds Quarry has been estimated from the differences between the other Brayton Road daily traffic surveys.*

Hourly traffic volumes from the local road tube traffic counts and the intersection traffic surveys undertaken in the Marulan area in August 2015 are summarised in Table 2.2.

Table 2.2 Peak hourly traffic volumes

Road	hourly volume					
	Early morning	Morning peak	Morning peak	Early afternoon	Afternoon peak	Afternoon peak
	6–7 am	7–8 am	8–9 am	2–3 pm	3–4 pm	4–5 pm
Hourly volumes from tube traffic surveys						
Brayton Road (west of the Bypass Road)	51	55	56	55	46	53
Brayton Road (east of the Bypass Road)	41	39	28	33	27	21
Bypass Road (north of Brayton Road)	14	31	37	34	34	45
Hourly volumes from intersection traffic surveys						
Hume Highway (north of Red Hills Road)	752	1,092	1,302	1,278	1,383	1,395
Red Hills Road (at Hume Highway)	26	57	24	44	24	18
Brayton Road urban (at George Street)	58	74	86	86	101	93
George Street (south of Brayton Road)	57	104	135	150	153	156



Existing daily traffic volumes

Gunlake Quarry
Transport Assessment

Figure 2.2

2.4 Traffic capacity standards

2.4.1 Levels of service

Daily and peak hourly traffic volume standards for major rural roads are set by the RMS's *Guide to Traffic Generating Developments* (RTA 2002) (the RMS guideline). The RMS guideline defines six Levels of Service for rural roads:

- **Level of Service A:** The top level of service is a free flow condition in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high and the general level of comfort and convenience provided to traffic is excellent.

- **Level of Service B:** This level of service is termed stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience for traffic is a little less than that of Level of Service A.

- **Level of Service C:** This level of service is also in the stable flow zone, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience for traffic declines noticeably at this level.

- **Level of Service D:** This level of service is close to the limit of stable flow, approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor and small increases in traffic flow would generally cause operational problems.

- **Level of Service E:** This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream would cause a traffic-jam.

- **Level of Service F:** This service level is termed forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs and queuing and delays result.

General maximum hourly traffic volume standards for multi-lane roads are defined in the RMS guideline for Levels of Service A to F. However, more detailed calculations are able to be made by reference to the *Austroads Guide to Traffic Engineering Practice–Part 2 Roadway Capacity* (Austroads 1988).

2.4.2 Hume Highway

For major rural highways such as the Hume Highway, the Levels of Service are influenced by the road design and traffic operating characteristics for the road. The road is typically a dual carriageway road with design and operating characteristics as follows:

- typical lane width is 3.5 m;

- typical shoulder width is 3.0 m (sealed);

- typical terrain is level or rolling, with additional climbing lanes provided where the gradients are steeper;

- the afternoon peak hourly directional distribution of traffic (north/south) is 55%/45%;
- approximately 15% to 20% of traffic is heavy vehicles; and
- weekday peak hour traffic is approximately 7.5% of average daily traffic.

The typical hourly and daily traffic volume ranges for these roads for each level of service are given in the RMS guideline for four-lane roads. This indicates the following traffic categories:

- Level of Service A, up to 900 vehicles per hour (21,800 vehicles per day);
- Level of Service B, range of 900–1,400 vehicles per hour (21,800–33,900 vehicles per day);
- Level of Service C, range of 1,400–1,800 vehicles per hour (33,900–43,600 vehicles per day);
- Level of Service D, range of 1,800–2,200 vehicles per hour (43,600–53,300 vehicles per day);
- Level of Service E, range of 2,200–2,800 vehicles per hour (53,300–68,000 vehicles per day); and
- Level of Service F, over 2,800 vehicles per hour (68,000 vehicles per day).

On the rural sections of the Hume Highway north of Marulan, the estimated current (2015) daily traffic volumes, with +2% annual growth since 2012, are:

- Hume Highway at Penrose: 22,600 daily vehicle movements (Level of Service B);
- Hume Highway at Mittagong: 20,900 daily vehicle movements (Level of Service A); and
- Hume Highway at Pheasants Nest: 36,000 daily vehicle movements (Level of Service C).

2.4.3 Local roads

For the local roads assessed, the current traffic situation and the future traffic impacts of the Project need to be considered in terms of daily traffic volumes.

The road width design standards for low volume (generally rural) roads are defined by the Austroads (2010) and are based on daily traffic volumes. The Austroads (2010) requirements for these roads, based on the daily traffic volumes in Table 2.1, are as follows:

- For 0–150 daily vehicles, Austroads (2010) requires single-lane sealed. Unsealed dual lane is also generally acceptable, based on other historic standards (eg NAASRA 1984). However, none of the local roads which are listed in Table 2.1 have daily volumes in this category;
- For 150–500 daily vehicles, Austroads requires a 6–7 m wide seal (7 m wide if there are more than 15% heavy vehicles). This traffic volume standard is applicable to:
  - Brayton Road west of the Gunlake Quarry access road;
  - Brayton Road east of the Bypass Road intersection; and
  - Bypass Road and Red Hills Road, between Brayton Road and the Hume Highway.

- For 500–1,000 daily vehicles, Austroads (2010) requires a 7–8 m wide seal. This traffic volume standard is applicable to:
    - Brayton Road, between the Gunlake Quarry access road and the Bypass Road intersection.
- For 1,000–3,000 daily vehicles, Austroads requires a 9 m wide seal. This is not applicable to any of the local road sections of either Brayton Road or the Bypass Road in the Marulan area currently.

The current sealed widths of all sections of Brayton Road and the Bypass Road route are considered to meet the Austroads design standard for the existing traffic usage volumes listed in Table 2.1.

For the two quarry access roads, at Gunlake Quarry and Johnniefelds Quarry respectively, the current daily traffic volumes are in the range of 200–250 vehicle movements daily, with substantial proportions of heavy vehicle traffic (see Table 2.1).

These roads are not public roads. However on the approaches to the public roads, they should be sealed for a minimum distance of 100 m with a 7 m wide seal. This would be beneficial for dust control purposes and also to minimise the potential tracking of dirt and gravel onto public roads via the tyre tracks of the quarry haulage trucks.

2.5 Existing road pavement condition

The existing road pavement condition for the haulage route has been summarised from the recent route photographs (Appendix B). The overall road pavement condition of the 7.6 km primary haulage route between the Gunlake Quarry access road and the Hume Highway was observed to be in a satisfactory condition in September 2015, with no surface defects visible along most sections of this main haulage route.

The haulage route sections, which are approved as B-Double routes, are shown in Figure 2.3.

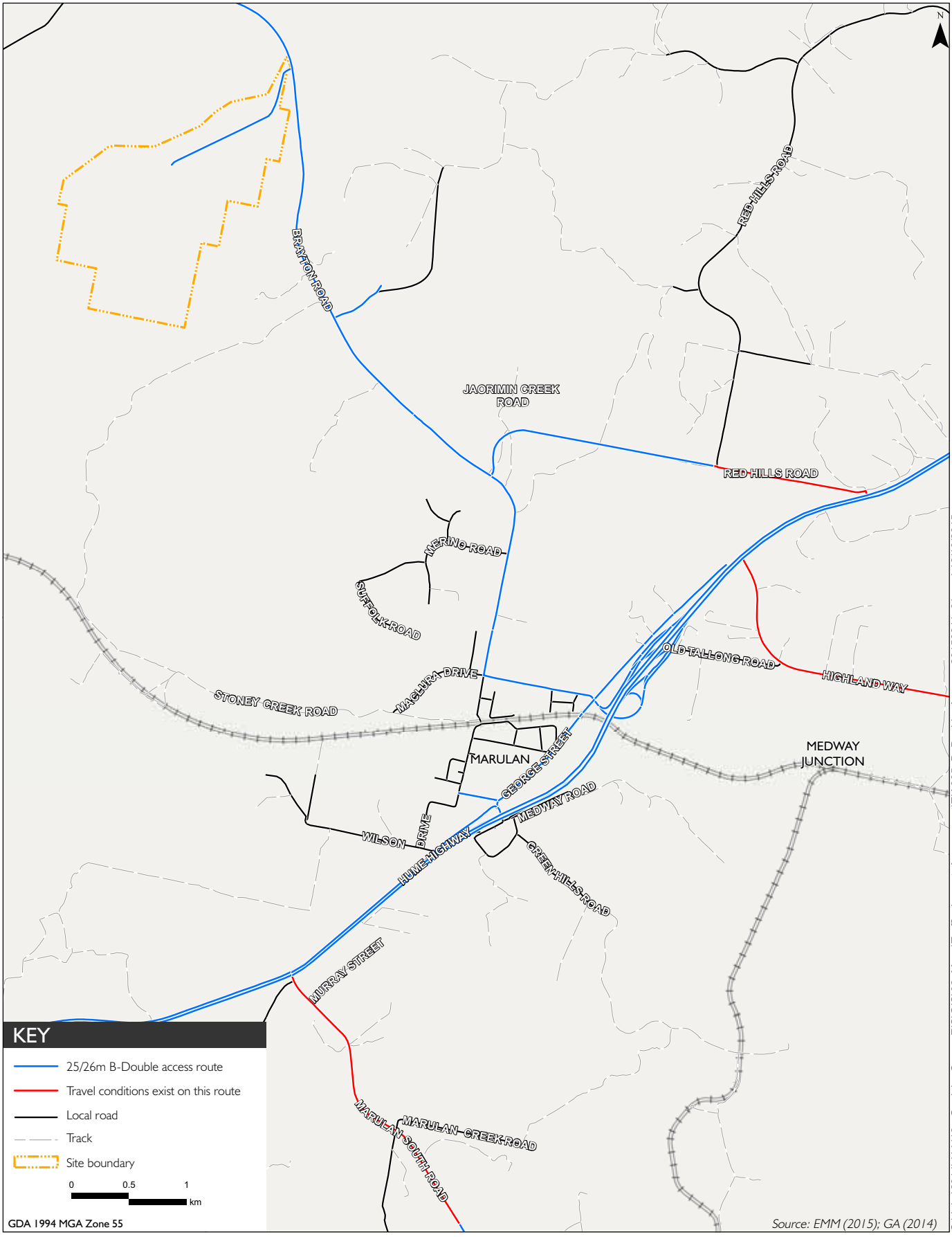
The only visible road defects or surface deformation were observed over a short eastbound section of the Bypass Road immediately to the north of the Brayton Road intersection, where the road curves sharply to the north for outbound trucks.

An assessment of the overall haulage route road pavement condition was undertaken by Falling Weight Deflectometer (FWD) structural testing (Pavement Management Services, 2014). The assessment indicates that approximately 93% of the haulage route road pavement was expected to have a minimum future serviceable life of 20 years, with only localised surface repairs being needed, with the exception of the sections within 100 m of the Brayton Road and Bypass Road intersection, which have a cement stabilised roadbase and a different methodology is required to assess these sections.

2.5.1 Current road maintenance expenditure

Gunlake currently pay s94 contributions to Council regarding road maintenance.

Gunlake's capital works contribution on roads including s94 contributions have been $3.3 million to date (see Table 2.3).



B Double access routes

Gunlake Quarry
Transport Assessment

Figure 2.3

Table 2.3 Gunlake Quarry roadwork contributions

Year	s94 Contribution	Capital works	Road section
2010/2011	$35,962	$100,650	Brayton Road from Gunlake to Johnniefelds quarry
2011/2012	$47,917	-	
2012/2013	$62,937	$1,695,120	Bypass road
2013/2014	$81,418	$338,516	Hume Highway Intersection
	-	$230,715	Red Hills Road from Bypass Road to Hume Highway
2014/2015	$87,376	$607,200	Brayton Road from Johnniefelds to McClura Drive
Sub-total	$315,610	$2,972,201	
Total s94 and capital costs	**$3,287,811**		

The Bypass Road route was completed by Gunlake in 2012 and the existing sections of Red Hills Road were upgraded (at a cost of about $2.3 million to Gunlake plus $0.95 million for the purchase of land) for future road transport of quarry product. These roads were dedicated back to Council and are public roads.

Brayton Road has more recently (in 2015) been reconstructed by Council – using Gunlake's s94 contributions and an extra $607,000 from Gunlake – to provide an upgraded road.

The construction standard of the recent Brayton Road upgrade meets the current Austroads (2010) road design standard for the current traffic volumes and exceeds the Council's Development Control Plan requirements.

2.6 Intersection designs

The existing rural and urban intersections on the Project-affected roads have generally been constructed to appropriate design standards given the traffic operating characteristics of the roads, (see Photographs 2.1 to 2.14).

Austroads (2010) provides intersection design standards where additional intersection turning lanes are required by the combination of the through traffic and the left or right turning traffic volumes.

On the haulage route, west of the Hume Highway, the existing intersection traffic volumes for either through traffic or turning traffic are generally too low to require any additional turning lanes at the intersections.

However at the Hume Highway and Red Hills Road intersection, an additional left turning deceleration lane is provided to facilitate the left turning movement by traffic which is turning off the Hume Highway onto Red Hills Road.

Photograph 2.1 **Brayton Road at Gunlake Quarry intersection looking west**

Photograph 2.2 **Gunlake Quarry at the access road intersection looking north**

Photograph 2.3 **Brayton Road east of Johnniefelds Quarry intersection looking east**

Photograph 2.4 **Brayton Road west of Bypass Road intersection looking west**

Photograph 2.5 **Brayton Road at the Bypass Road intersection looking west**

Photograph 2.6 **Brayton Road at the Bypass Road intersection looking east**

Photograph 2.7 **Bypass Road at the Brayton Road intersection looking south**

Photograph 2.8 **Red Hills Road at Hume Highway intersection looking east**

Photograph 2.9 Brayton Road at the Stony Creek Road intersection (Marulan) looking west

Photograph 2.10 George Street at the Brayton Road intersection (Marulan) looking north

Photograph 2.11 **Brayton Road at the George Street intersection (Marulan) looking east**

Photograph 2.12 **South Marulan Road east-side interchange intersection looking south**

Photograph 2.13 South Marulan Road interchange overpass crossing the Hume Highway

Photograph 2.14 South Marulan Road west-side interchange intersection looking west

The current design standard of the assessed intersections are summarised in Table 2.4.

At the Gunlake and the Johnniefelds quarry access intersections, additional road widening has been provided on Brayton Road. A left-turn truck deceleration lane is provided at the Gunlake Quarry access road and a left turn truck acceleration lane is provided at the Johnniefelds quarry access road.

Table 2.4 Existing intersections

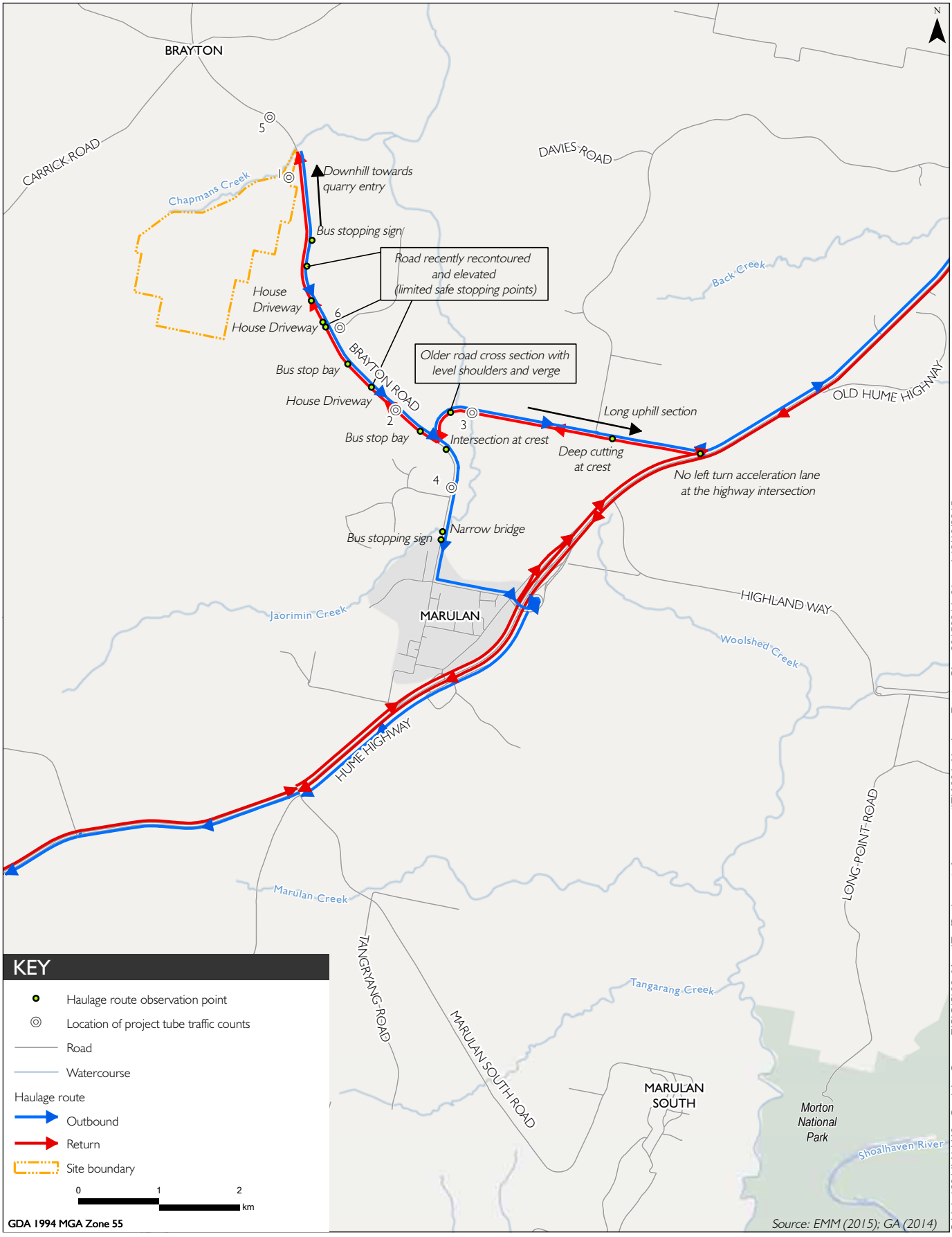
Major road	Minor road	Intersection type	Existing Intersection standard
Brayton Road	Gunlake Quarry access	Standard rural T-intersection	The Quarry access road is sealed and has a speed hump and a Stop Sign. A left turn deceleration lane is provided for the quarry truck traffic.
Brayton Road	Bypass Road	Rural T-intersection	There are concrete islands on all three intersection approaches.
Hume Highway	Red Hills Road (Bypass Road)	Rural highway intersection	The intersection has recently had the median closed to prevent right turns and has a left turn deceleration lane on the Hume Highway.
Brayton Road	Stony Creek Road	Four-way urban intersection	There are no additional intersection turning lanes. The major traffic route turns from the east to the north at the intersection.
George Street	Brayton Road	Four-way urban intersection	There are no additional intersection turning lanes. To the east the intersection provides the main Marulan urban area Hume Highway access via ramps from this intersection.
Hume Highway	South Marulan Road (east-side) interchange intersection	Four-way roundabout	The intersection is located off the Hume Highway. It provides access for local rural farm and quarry truck traffic and U-turn access for Gunlake Quarry truck traffic.
Hume Highway	South Marulan Road (west-side) interchange intersection	Four-way rural minor road intersection	The intersection is located off the Hume Highway. It provides access for local rural farm and quarry truck traffic and U-turn access for Gunlake Quarry truck traffic.

2.7 Traffic safety

A visual inspection of the existing sections of the product haulage route was undertaken on Friday 4 September 2015.

The current locations of relevant road features noted during the site visit and potential safety-related features of the current haulage route traffic operations are presented in Figure 2.4.

Also during the afternoon on Friday 4 September 2015, direct observations of the truck travel times on the local haulage route between the Gunlake Quarry access road and the Hume Highway via Brayton Road and the Bypass Road were undertaken. This included recording the range of typical waiting times for Gunlake Quarry trucks before turning onto the Hume Highway from Red Hills Road during periods of relatively high northbound traffic flow on the Hume Highway. The survey results and related highway traffic safety observations are summarised in Table 2.5 and Table 2.6.



Haulage route observations

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Figure 2.4

Table 2.5 Truck travel times to the Hume Highway and waiting times

Depart quarry weighbridge	Arrive Hume Highway	Travel time (minutes)	Minus 3 minutes on Quarry Access Road [1]	Wait time (seconds) at the Highway	Hume Highway traffic changed lanes	Hume Highway traffic delayed
11.55	12.07	12	9	0	-	-
11.57	12.10	13	10	20	✓	-
12.13	12.25	12	9	0	✓	-
13.02	13.11	9	6	0	✓	✓
13.29	13.45	16	13	36	-	-
13.45	13.59	14	11	18	-	-
13.58	(2)	-	-	-	-	-
14.00	14.14	14	11	0	✓	✓
14.07	14.18	11	8	10	-	-
14.12	14.25	13	10	0	✓	-
14.20	14.34	14	11	0	✓	-
14.24	14.35	11	8	0	✓	✓
14.26	14.35	9	6	0	✓	✓
14.28	14.40	12	9	0	✓	-
14.30	14.43	13	10	6	-	-
14.37	14.50	13	10	2	-	-
14.39	14.52	13	10	50	-	-

Notes: 1. EMM observations 4 September 20.15 Trucks are assumed to take three minutes to travel internally from the quarry weighbridge before reaching Brayton Road.

2. This truck was not observed to travel via Red Hills Road and is assumed to have travelled via Brayton Road to Marulan.

Table 2.6 Truck travel times from the Hume Highway

Depart Hume Highway	Arrive quarry	Travel time	Minus 3 minutes on Quarry Access Road
12.10	12.18	8	5
12.14	12.23	9	6
13.12	13.25	13	10
13.18	13.27	9	6
13.34	13.45	11	8
13.39	13.50	11	8
13.42	13.52	10	7
13.52	14.04	12	9
14.03	14.12	9	6
14.03	14.14	11	8
14.03	14.15	12	9
14.10	14.24	14*	11*
14.10	14.27	17*	14*
14.10	14.29	19*	16*
14.15	14.36	21*	18*

*Notes: * RMM observations 4 September 2015. These trucks were probably delayed by previous trucks using the weighbridge when multiple trucks arrived in a group.*

From the truck travel time survey samples (Table 2.5 and Table 2.6), the typical journey times for trucks travelling between the Hume Highway and the Gunlake Quarry access road are:

- approximately 9.5 minutes for the loaded trucks which are travelling outbound from the quarry towards the Hume Highway; and
- approximately 7.5 minutes for the empty trucks which are returning to the quarry.

Additionally, the average waiting time for the Gunlake Quarry trucks at the Red Hills Road–Hume Highway intersection was calculated as 9 seconds for the 16 outbound trucks which were recorded (see Table 2.5). Over half of the outbound trucks (nine out of sixteen) were not delayed at all at the intersection, although in many cases their entry manoeuvres onto the Hume Highway did cause some following northbound traffic on the Hume Highway to change lanes. In some cases, where the traffic was not able to easily change lanes, there were resulting minor delays to other northbound traffic using the Hume Highway.

2.8 Public transport, pedestrian and cycling access

Marulan rail station has passenger rail services which are operated by NSW trains on a regular basis.

Local school bus services operate in the Marulan area via Brayton Road, which drop off and pick up their passengers at a number of locations between Marulan and the quarry access road. These locations are generally rural residential property access driveways of which four are located along the 3.4 km section of the quarry transport haulage route between the Bypass Road intersection with Brayton Road and the Gunlake Quarry access road intersection.

Due to the distances between the project area and the nearest urban areas of Marulan (approximately 5–7 km), local pedestrian or cycling access from urban areas to the quarry is unlikely.

3 Project description

3.1 Project overview

The Gunlake Quarry Extension Project application seeks a quarry life of 30 years from the date of the new project approval. However, there is sufficient resource in excess of 100 years of operations.

Only minor alterations are required to the fixed truck loading infrastructure at the quarry. The increased quarry production rates will primarily require an increase in the size (numbers) of the truck transport fleet.

Increased production at the quarry will ramp up over a many number of years (up to ten years).

3.2 Existing project area and infrastructure

Gunlake Quarry has been supplying the local region and the greater Sydney Metropolitan area with hard rock supplies since 2009. The quarry has approval to extract 750,000 tonnes of saleable product and is a significant supplier of heavy construction materials in NSW.

Key components of the existing quarry include:

- a quarry pit providing hard rock resources;
- overburden and excess product emplacement areas;
- drilling and blasting to release the rock material;
- crushing and screening of the quarried rock;
- truck loading and transport of hard rock; and
- ancillary infrastructure to support operations including offices, amenity buildings and other minor infrastructure.

The current project layout is provided in Appendix A.

Following extraction, quarried rock is transported north-east of the quarry pit to the rock processing area via haul roads. The rock processing area contains the following components:

- primary crusher;
- secondary crushers and screens;
- tertiary crushers and screens;
- main screen;
- interconnecting conveyors; and
- product stockpiles.

The processing area has a prepared hard surface of crushed rock material. It is used for stockpiling various products and for load out by a front end loader into road haul trucks for delivery to markets.

The processing plant contains atomised water dust suppression systems at all discharge points.

3.3 Gunlake extension project

Gunlake seeks a new development consent that allows:

- 2 million tonnes per annum (Mtpa) of saleable products to be produced;
- an increase in truck movements to an average of 440 movements per day (ie 220 laden trucks) and a maximum rate of 690 movements per day;
- all of the additional quarry truck movements would travel via the Bypass Road route;
- extension of the quarry pit footprint to approximately 54 ha (Figure 2);
- 24 hour per day primary crushing;
- additional overburden emplacement to accommodate the increase in production; and
- blasting twice weekly.

In addition, Gunlake seeks to maintain the approval for all aspects of the existing operations for Gunlake Quarry under Project Approval 07-0074. A summary of the Extension Project is provided in Table 3.1.

Table 3.1 Project summary

Project element	Currently approved	Proposed
Quarrying method	Hard rock quarrying by open cut methods.	No change.
Resource	Approximately 180 million tonnes.	No change.
Saleable product	750,000 tonnes per annum.	Increase to 2 Mtpa.
Quarry life	30 years.	30 years from approval. There is sufficient resource (180 Mt) for quarrying to continue at 2 Mtpa for 90 years.
Beneficiation	Onsite crushing and stockpiling of quarried rock.	No change.
Infrastructure	As outlined in Section 3.3.	Upgrade infrastructure as required to produce 2 Mtpa of products.
Product transport	An average of 164 truck movements per day.	Increase truck movements to an average of 440 movements per day and a maximum of 690 movements per day.
Operational workforce	25 on-site employees and 25 to 38 truck drivers (full-time equivalent).	Increase of approximately 27 on-site employees and truck drivers.
Hours of operation	6:00 am Monday to 6:00 pm Saturday, including crushing between 7:00 am and 6:00 pm, Monday to Saturday and maintenance at any time, Monday to Saturday.	Modify existing hours of operation to allow crushing 24 hours a day (except Sundays and public holidays) and maintenance anytime (including Sundays and public holidays).

3.4 Project traffic generating activities

The quarry is located on Brayton Road, north-west of Marulan. Brayton Road is part of the transport route linking the quarry to the Hume Highway. Products for markets north of the quarry are transported using Brayton Road and a purpose built Bypass Road which connects Brayton Road to Red Hills Road and then to the Hume Highway.

For the transport of quarry materials to customers south of the quarry, trucks travel along Brayton Road, through the northern edge of Marulan and access the Hume Highway via the Marulan southbound access ramp. All truck traffic returning to the quarry uses the Red Hills Road, Bypass Road and Brayton Road route.

3.4.1 Potential use of rail transport

An investigation of the feasibility of the use of rail to transport material from the quarry has been undertaken and included in Appendix C of the EIS report. It explored the various constraints and opportunities for a potential rail transport operation for the quarry including:

- the likely cost and feasibility of constructing rail access from the quarry to the Main Southern Railway, south west of Marulan;
- the diverse nature of the quarry products to be transported and the range of typical product destinations in the Sydney region;
- the potential requirements for an additional quarry product storage and materials distribution facility within the Sydney Metropolitan area to store quarry products (including double handling), before their subsequent onward transport to the Gunlake customers within the Sydney region; and
- the constraints of the existing rail network for the interstate railway between Marulan and Moss Vale, which limits the scope for creating additional rail paths for locally-based freight trains.

Potential rail transport from the quarry has been investigated and found not to be feasible, largely because the quarry does not currently have direct access to the Main Southern railway line and there will be a high capital cost and high potential local environmental impacts resulting from its construction due to the difficult terrain.

Additionally, the future transport of the major proportion of the Gunlake Quarry products by rail to customers in the Sydney Metropolitan area would also require a separate transfer station to be established with rail unloading and product storage facilities. It is likely this would be located within either the Liverpool or Bankstown LGA which would further increase both the capital and the ongoing cost requirements for the future use of rail transport over the lifetime of the quarry.

3.5 Traffic generation

3.5.1 Construction phase traffic generation

Construction stage activities and related traffic movements are anticipated to be minimal as the existing quarry infrastructure for product crushing and grading and the quarry truck loading facilities are generally adequate for the proposed increase in annual quarry production.

The increased quarry production will primarily require an increase in the size of the quarry truck transport fleet and a greater typical number of hours each day when the quarry product transport trucks would be operating.

3.5.2 Operational phase traffic generation

i Workforce

The peak workforce at the quarry during the operational phase would be approximately 77 persons. This is an increase of 27 persons from the current quarry workforce. The majority of the increase will be due to the additional truck drivers required.

The likely residential locations of the additional operational workforce would be approximately:

- 80% based in the Marulan area;
- 10% based in other Southern Highlands townships to the south-west, including Goulburn; and
- 10% based in other Southern Highlands townships to the north-east.

It has been assumed that an additional 54 car traffic movements per day (27 return trips) would be generated by the additional quarry workforce. This would be primarily travelling to and from the local Marulan area. The remainder would probably be travelling to and from other regional destinations via the Hume Highway route.

ii Product haulage

Although approved for 24 hour transport operations via the Bypass Road route on weekdays (between 2.00 am on Mondays to 6.00 pm on Saturdays), the quarry truck transport operations do not fully utilise this period currently. Therefore, there is considerable scope for increasing the overall weekly production at the quarry without actually increasing the current peak hourly loading rates for the truck transport operations from the quarry.

However for this TA it has conservatively been assumed that the potential future peak hourly truck dispatch rates from the quarry could increase in direct proportion to the approved annual tonnage increase.

Under the current quarry approval for 750,000 tonnes annual production, the quarry operates with an average of 164 truck movements (82 truck loads) each day and a peak hourly truck loading rate of 11 truck loads per hour, during either the morning (8.00 to 9.00 am) or the afternoon (4.30 to 5.30 pm) peak hourly traffic periods on the surrounding roads.

At other times of the day, higher truck loading rates can occur at the quarry, but these do not correspond to actual peak hourly traffic conditions for other traffic in the Marulan area.

For the future quarry production limit of 2,000,000 tonnes per annum, the average daily number of quarry truck movements would increase to 440 (220 truck loads) and the maximum hourly truck loading rates during the morning and afternoon peak hourly traffic periods would also potentially increase to 29 truck loads per hour, limited by the quarry's ability to load and dispatch laden trucks.

On busy future production days at the quarry, the potential maximum daily number of truck movements could increase to 690 (345 truck loads). However, on these days, the additional quarry production rate would be achieved by increasing the actual quarry truck transport hours (still within the approved 24 hour quarry transport operating period on weekdays) and there would be no further increase in the anticipated future maximum truck peak hourly loading rate of 29 trucks per hour.

This TA has considered the daily traffic impacts of the proposed project haulage operation on the road network and intersections in the interim short term situation (Chapter 4), for the period when the Johnniefelds quarry is still operating and its truck traffic is still using Brayton Road, Bypass Road and Red Hills Road and the longer term situation (Chapter 5) when the Johnniefelds quarry is no longer operating and its truck traffic is no longer using Brayton Road, Bypass Road and Red Hills Road.

4 Short-term project stage traffic impacts

4.1 Traffic generation

Traffic generation for the extension project operations is described in Section 3.5.2.

To assess traffic impacts, the future background traffic using the Hume Highway has been assumed to have a linear growth rate of 2% per annum. It has also conservatively been assumed that the forecast traffic reductions from the closure of Johnniefelds quarry would not have occurred by the time of the assessed short-term project operations, which is based on the current year (2015) network traffic volumes.

The predicted base traffic volumes for the affected roads in 2015 are presented in Table 4.1. The Hume Highway daily traffic volumes which were surveyed by RMS in 2012 would have increased by approximately 6% by 2015.

Table 4.1 Base road network daily traffic volumes (2015)

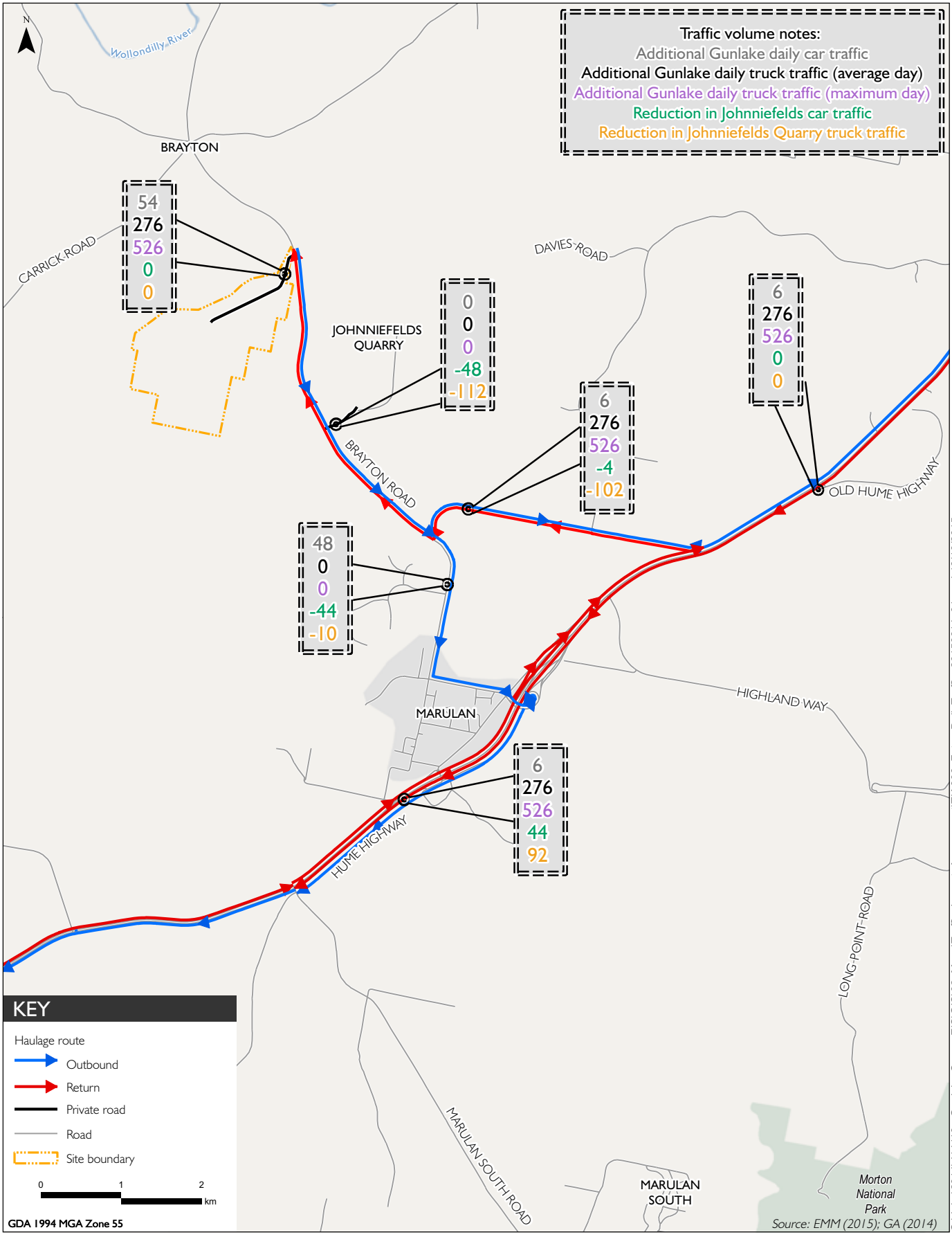
Road name	Average daily traffic	
	All traffic	Heavy vehicles
Hume Highway at Penrose	22,600	4,065
Hume Highway at Mittagong Bypass	20,900	4,175
Hume Highway at Pheasants Nest	36,000	5,400
Brayton Road (west of the Bypass Road)	720	326
Bypass Road (north of Brayton Road)	398	221
Brayton Road (east of the Bypass Road)	448	99
Brayton Road (west of George Street)	1,130*	73*
George Street (south of Brayton Road)	1,750*	107*

*Note: * The estimated daily traffic volumes for the urban sections of Brayton Road and George Street at Marulan in Table 4.1 have been estimated from the peak hour intersection traffic surveys using the ratio between the peak hourly and the daily traffic volumes traffic (tube counts) which was determined from the nearest adjoining section of Brayton Road (Figure 2.2).*

4.2 Road carriageway impacts

The changes in the daily traffic volumes from the future project operations, for both the average (440) and the maximum (690) daily truck traffic movements, and the future traffic reductions from the closure and relocation of production from the Holcim Johnniefelds Quarry, are shown in Figure 4.1.

The predicted traffic volume increases for the affected roads for short-term future project operations (based on the 2015 road network traffic volumes) are summarised in Table 4.2 and Table 4.3 for average daily (440 truck movements) and maximum daily production (690 truck movements), prior to any closure of the Johnniefelds Quarry.



Additional project daily traffic volumes

Gunlake Quarry
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Figure 4.1

Table 4.2 Average project daily traffic increases for each route (2015)

Road name	Average daily traffic[1]		Extension Project daily traffic[2]		Total daily traffic		Traffic increase (%)
Vehicle type	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**
Hume Highway at Penrose	22,600	4,065	282	276	22,882	4,341	1.2
Hume Highway at Mittagong Bypass	20,900	4,175	282	276	21,182	4,451	1.3
Hume Highway at Pheasants Nest	36,000	5,400	282	276	36,282	5,676	0.8
Brayton Road (west of the Bypass Road)	720	326	330	276	1,050	602	45.8
Bypass Road (north of Brayton Road)	398	221	282	276	680	497	70.9
Brayton Road (east of the Bypass Road)	448	99	48	0	496	99	10.7
Brayton Road (west of George Street)	1,130	73	48	0	1,178	73	4.2
George Street (south of Brayton Road)	1,750	107	48	0	1,798	107	2.7

Notes: 1. This traffic includes the existing quarry traffic movements for 750,000 tonnes per annum production.

Table 4.3 Maximum project daily traffic increases (2015)

Road name	Average daily traffic		Project daily traffic		Total daily traffic		Traffic increase (%)
Vehicle type	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**
Hume Highway at Penrose	22,600	4,065	532	526	23,132	4,591	2.4
Hume Highway at Mittagong Bypass	20,900	4,175	532	526	21,432	4,701	2.5
Hume Highway at Pheasants Nest	36,000	5,400	532	526	36,532	5,926	1.5
Brayton Road (west of the Bypass Road)	720	326	580	526	1,300	852	80.6
Bypass Road (north of Brayton Road)	398	221	532	526	930	747	133.7
Brayton Road (east of the Bypass Road)	448	99	48	0	496	99	10.7
Brayton Road (west of George Street)	1,130	73	48	0	1,178	73	4.2
George Street (south of Brayton Road)	1,750	107	48	0	1,798	107	2.7

4.2.1 Brayton Road

Along sections of Brayton Road on the product haulage route (ie between Gunlake Quarry, and the Bypass Road and Hume Highway intersection), the average and maximum additional project traffic usage would be approximately 330 and 580 daily vehicle movements respectively, consisting of 276 to 526 product truck movements and 54 car/other light vehicle movements.

In this assessment, it is assumed that there will be minimal project-related car or truck traffic movements travelling to or from the west via Brayton Road, west of Gunlake Quarry.

In Table 4.2 and Table 4.3, the assessed additional project traffic on Brayton Road, between Gunlake Quarry and the Bypass Road, would result in 46–81% increase to the 2015 current daily traffic volumes on the average and the maximum transport day (assuming that quarry production immediately increases to 2 Mtpa when, in reality production will ramp up over up to ten years). Where these traffic increases would increase the total daily traffic usage of the road to within the range of 1,000 to 3,000 daily vehicle movements, a 9 m-wide sealed road width would be required in accordance with the Austroads (2010) *Rural Road Design Standards*, section 2.4.3.

The upgraded section of Brayton Road generally meets Austroads (2010) recommendation of a 9 m-wide sealed road width for a road with a daily average of up to 1,000 vehicle movements.

With the inclusion of truck traffic from Johnniefelds Quarry, and assuming an immediate ramp up to 2 Mtpa production, the predicted total average movements on Brayton Road west of Bypass Road would exceed 1,000 vehicle movements by 50 movements per day.

The recent road upgrade by Council considered future truck numbers, which were provided to the Council in June 2015. No further road improvements to Brayton Road are proposed. On the other sections of Brayton Road, between the Bypass Road and Marulan, there would be no additional daily heavy vehicle traffic and the additional project related traffic would be cars and other light vehicles only. These traffic increases would result in 4–11% increases in comparison to the current 2015 daily traffic volumes.

On George Street at Marulan, the project generated daily traffic usage would result in 3% increases or lower. This additional traffic would not result in any additional requirements for the seal widening or other traffic improvements to these roads.

4.2.2 Bypass Road

On the Bypass Road route, where the existing daily traffic volumes are lower than on Brayton Road, the project-generated daily traffic increases would be proportionally higher.

In Table 4.2 and Table 4.3, the additional project traffic on the Bypass Road route would result in 71–134% increase to the 2015 daily traffic volumes. However, the future total daily traffic usage for the Bypass Road would generally remain below 1,000 daily vehicle movements and the existing 7–8 m wide road sealed width would continue to be adequate for this section of the haulage route in accordance with the Austroads (2010) *Rural Road Design Standards*.

4.2.3 Hume Highway

On the sections of the Hume Highway north of Marulan, the additional project operations traffic increases would be approximately 1% for general traffic (approximately 5–7% for heavy vehicle traffic) on an average transport day. On a maximum transport day, there would be approximately 2% general traffic increases and approximately 10–13% more heavy vehicles using the route.

These predicted daily traffic increases would potentially be noticeable to other traffic, particularly on a maximum transport day, but would not generally require any improvements to the road carriageway in order to accommodate the additional traffic.

The corresponding maximum daily traffic volume for the Pheasants Nest section of the Hume Highway would increase from approximately 36,000 daily vehicle movements 36,532 daily vehicle movements. However, this volume would remain within the general range of the Level of Service C daily traffic volumes for the typical Hume Highway traffic composition (see Section 2.4.2).

4.3 Short-term intersection impacts

Assessment of the project-generated intersection traffic impacts has been undertaken using SIDRA 5.1 intersection capacity analysis for the following intersections:

- the Red Hills Road Hume Highway access intersection;
- the Brayton Road and Bypass Road intersection, approximately 3 km north-west of Marulan; and
- the two intersections on the east and west sides of the Hume Highway at the South Marulan Road interchange, which is approximately 3.5 km south-west of Marulan.

The SIDRA intersection capacity analysis results are included in Appendix D. The reporting parameters for different intersection levels of service are summarised in Table 4.4.

Table 4.4 Intersection level of service standards

Level of service	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('stop' and 'give way')
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity At signals, incidents would cause excessive delays Roundabouts require other control mode	At capacity; requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: RTA (2002).

At the assessed intersections, the following intersection traffic scenarios have been assessed:

- existing 2015 base peak hour traffic volumes, adjusted for the recently approved increases to project traffic for 750,000 tonnes annual production; and
- the corresponding 2015 intersection traffic volumes with a maximum of 29 trucks per hour travelling both to and from Gunlake Quarry, prior to any reduction in traffic on Brayton Road and the Bypass Road as a result of the closure of Holcim's Johnniefelds Quarry and the subsequent relocation of its production to Lynwood Quarry.

Summaries of the SIDRA intersection results, with and without the additional project traffic, are provided in Table 4.5 to Table 4.8.

4.3.1 Brayton Road and Bypass Road intersection

For all of the 2015 traffic scenarios considered (Table 4.5), the Brayton Road and Bypass Road intersection would operate at a very low degree of saturation (less than 0.102, ie 10% capacity) with a high level of service (Level of Service either A or B).

Table 4.5 Brayton Road and Bypass Road intersection assessment (2015)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2015 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	65	17.2	B	0.033	1
	Afternoon peak hour (4.30 to 5.30 pm typically)	64	14.5	A	0.017	1
2015 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	116	19.8	B	0.102	5
	Afternoon peak hour (4.30 to 5.30 pm typically)	121	19.1	B	0.094	4

Notes: *1. LoS = Level of service.*

2. DoS = Degree of saturation.

4.3.2 Red Hills Road and Hume Highway intersection

There would be generally minimal traffic delays (less than 20 seconds per vehicle for the most delayed right turning traffic movements) and minimal intersection queue lengths (typically less than one vehicle on any intersection approach).

For all of the 2015 traffic scenarios investigated (Table 4.6), the Red Hills Road and Hume Highway intersection would be operating at relatively low intersection degrees of saturation (less than 0.332, ie about 33% capacity). The intersection movement with the highest traffic delay is the left turn from the Red Hills Road approach onto the Hume Highway. Here, traffic has to give way to the northbound traffic on the Hume Highway.

Table 4.6 Red Hills Road and Hume Highway intersection assessment (2015)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2015 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	1,379	27.2	B	0.221	3
	Afternoon peak hour (4.30 to 5.30 pm typically)	1,479	24.2	B	0.211	1
2015 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	1,429	38.3	C	0.269	12
	Afternoon peak hour (4.30 to 5.30 pm typically)	1,536	50.5	D	0.332	14

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

In the 2015 morning and afternoon peak hours in the 'with project traffic' analysis scenarios, the left turn from Red Hills Road movement will have increased traffic delays (Level of Service C or D). These would be more noticeable than the current average intersection traffic delays of 24 to 27 seconds per vehicle which has been calculated for the base case traffic assessment using the SIDRA program.

In accordance with the RMS intersection capacity guidelines (Table 4.3), where an intersection is operating at Level of Service D, additional accident and safety studies should be undertaken for the intersection. The additional truck turning delays and safety observations which were undertaken by EMM at the intersection on Friday 4 September 2015, to satisfy this requirement.

4.3.3 South Marulan Road east-side intersection

For all of the 2015 traffic scenarios considered (Table 4.1), the South Marulan Road east-side intersection would operate at a very low degree of saturation (less than 0.065, ie 7% of capacity) and with a high level of service (Level of Service either A or B).

Table 4.7 South Marulan Road east-side intersection assessment (2015)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2015 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	95	13.1	A	0.032	1
	Afternoon peak hour (4.30 to 5.30 pm typically)	126	14.4	A	0.029	1
2015 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	120	13.9	A	0.065	3
	Afternoon peak hour (4.30 to 5.30 pm typically)	155	14.6	B	0.065	3

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

There would be generally low average traffic delays (less than 15 seconds per vehicle) for the most delayed right turning movement which is the traffic from the Hume Highway off ramp. This includes project truck traffic making a U-turn at the interchange. There would be minimal intersection queue lengths, typically less than one vehicle on any intersection approach.

4.3.4 South Marulan Road west-side intersection

For all of the 2015 traffic scenarios analysed (Table 4.8), the South Marulan Road interchange west-side intersection would operate at a very low degree of saturation (less than 0.078, ie 8% of capacity) and with a high level of service (Level of Service A).

Table 4.8 South Marulan Road west-side intersection assessment (2015)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2015 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	78	10.7	A	0.043	2
	Afternoon peak hour (4.30 to 5.30 pm typically)	116	9.8	A	0.034	1
2015 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	103	11.1	A	0.078	4
	Afternoon peak hour (4.30 to 5.30 pm typically)	144	11.4	A	0.069	3

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

There would be low average traffic delays (less than 11.5 seconds per vehicle) for the most delayed right turning traffic movement from South Marulan Road westbound onto the northbound Hume Highway on ramp. This includes the project truck traffic making a U-turn at the interchange. There would be minimal intersection traffic queue lengths, typically less than one vehicle typically on any intersection approach.

4.4 Traffic safety

The future project traffic safety impacts will be managed in accordance with the project traffic management plan. This includes a Driver code of conduct for Heavy Vehicles (the code) for all truck drivers who are operating to and from the Gunlake Quarry. These documents have recently been updated based on the recommendations of the recent project conditions approval (Modification 2). The updated traffic management plan and the code (prepared on 31 August 2015) have been submitted to DPE for approval.

Relevant extracts from the Code are provided below.

Driver Code of Conduct

The Code) has been prepared to address travelling speeds, procedures to ensure that drivers adhere to the designated transport routes and implement safe driving practices, particularly when entering the Hume Highway from Red Hills Road. All drivers reported or found to be acting in a manner contrary to the Code will be subject to disciplinary action.

General requirements

Heavy vehicle drivers hauling from Gunlake Quarry must:

- undertaken a Site Induction carried out by an approved member of the Quarry staff or suitably qualified person under the direction of the Quarry management;
- hold a valid driver's licence for the class of vehicle being operated;
- operate the vehicle in a safe manner within and external to the Quarry site; and
- comply with the direction of authorised site personnel when within the site.

Heavy vehicle speed

The following speed restrictions apply in relation to the Gunlake Quarry:

- speed limit of 40 km/hr on Quarry Access Road from Brayton Road to the weigh bridge;
- speed limit of 20 km/hr on all other internal access and haul roads;
- speed limit of 40 km/hr when proceeding past stationary school buses; and
- all heavy vehicles travelling to or from the Quarry must not travel over 80 km/hr between the Quarry and the Hume Highway.

Drivers are to observe and not exceed the posted speed limits on all public roads, with speed adjusted appropriately to suit the road environment and prevailing weather conditions, to comply with the Australian Road Rules.

When a heavy vehicle is detected travelling at 15 km/hr or more over the posted or relevant heavy vehicle speed limit by a mobile Police unit or fixed speed camera, the Roads and Maritime Services will record a strike against that vehicle. If three strikes are recorded within a three year period, the Roads and Maritime Services will act to suspend the registration of the vehicle (up to three months).

Driver fatigue

The National Heavy Vehicle Accreditation Scheme allows heavy vehicle operators the choice of operating under three fatigue management schemes: Standard Hours of Operation; Basic Fatigue Management (BFM); and Advanced Fatigue Management (AFM). All heavy vehicle drivers operating out of the Gunlake Quarry Products are to be aware of their adopted fatigue management scheme and operate within its requirements.

Heavy vehicle control

In order to minimise the impact of noise from truck transport, the following controls apply to truck operators at Gunlake Quarry:

- compression brakes are not to be used in the vicinity of Marulan Village;
- tailgates must be locked and secured to avoid noise or spillage;
- always observe the posted speed on site and the local road network;

- no tailgating is permitted – a 3 second gap is to be observed at all times; and
- equipment to be used must be fit for purpose.

Cleanliness

As required by Condition 38 (b), all loaded vehicles are to be inspected prior to leaving the site for cleanliness. Any materials that could fall on the road should be removed prior to leaving the site.

Vehicle departure and arrival (avoiding convoys)

To alleviate public concern and increase road safety, heavy vehicles leaving the Quarry should be separated. This will be controlled as far as practicable by the loader operator, however it is important for all drivers to be aware of the requirement to avoid convoys leaving the quarry.

Overtaking

There is to be no overtaking of road registered vehicles by Gunlake trucks or transport contractors while on Brayton Road, the Bypass Road, or Red Hills Road.

Protocols for interaction with school buses

Brayton Road, the Bypass Road, and Red Hills Road are used by the local school bus service. The bus stop locations can vary, depending on the residential address of the children using the bus on any given day, and it is at the discretion of the bus driver to decide where it is safe and appropriate to stop.

Four school bus stopping bays have recently been constructed along Brayton Road as part of the recent road upgrade. The hours of the school bus operation are approximately between 7.30 am and 9.00 am and 3.30 pm and 5.00 pm. Truck drivers are instructed to be aware of the possible school bus movements during these periods, and to decelerate if they see a school bus stopped beside the road, then proceed past the bus at a maximum speed of 40 km/hr.

4.5 Road pavement and maintenance impacts

A recent visual pavement condition assessment (Appendix B) has been undertaken by EMM for the product haulage route the road pavements were observed to be generally in good condition. The sections of Brayton Road, between the Bypass Road intersection and Marulan, which are not part of the primary haulage route for Gunlake Quarry but are routinely used by some outbound Gunlake Quarry trucks but are primarily used by the Johnnniefelds Quarry truck traffic.

The necessary short term and longer term maintenance requirements for these roads will continue to be fully funded by the Gunlake Quarry Section 94 contributions which will continue at a substantially increased annual rate once the annual production at the quarry is increased from 750,000 tonnes to 2,000,000 tonnes.

Table 4.9 identifies the current and likely future costs and revenues to the Council from the continued operation of the current Section 94 contributions for the haulage route maintenance.

Table 4.9 Summary of previous and future Gunlake Quarries annual Section 94 contributions

Council costs and revenue per year	500,000 tonnes	750,000 tonnes	2,000,000 tonnes
Routine maintenance	$5,000	$7,500	$20,000
Annual cost for pavement rehabilitation and reconstruction at $45/m^2 allowing 7,000 m x 9 m = 63,000 m^2	$94,500	$141,750	$378,000
Proportion of the route reconstructed each year	1/30th	1/20th	1/7.5th
Section 94 contributions payable by Gunlake	$135,000	$215,000	$618,000

The calculation in Table 4.9 is based on the Land and Environment Court of NSW, Case Number 11116 (2008) when it was agreed that the cost of rehabilitation and reconstruction was between $30/m^2 for a pavement of high structural adequacy to $65/m^2 for a greenfield site or a pavement of low structural adequacy. Given that the haul road is of high structural adequacy, the adoption of $45/m^2 is considered generous to the Council.

The short-term remedial program of road maintenance for these roads should continue to address existing specific deficiencies (eg cracks, potholes, failed patches, high severity rutting and shape loss) as they occur. This will ensure the route ride-ability (which also affects traffic safety) is maintained at the highest practicable standard.

4.6 Car parking

Additional car parking areas would be provided at the quarry to meet the identified demand for all the additional project workforce based at the quarry (approximately 27 persons).

4.7 Public transport

No public transport access requirements are anticipated for the project. However, the existing school bus stopping points along the haulage route will be monitored and additional safe bus stopping bays constructed where a need is identified based on whether residences house school children.

4.8 Pedestrian and cyclist access

Future access by the workforce using either cycling or walking is not envisaged to occur on a regular basis due to the comparatively remote nature of the project area.

5 Long-term predicted project impacts

5.1 Traffic generation

Traffic generation during the operational phase of the Project is described in Section 3.5.2. The long-term operational phase traffic impact assessment for 2025 has assumed background traffic to have a linear growth rate of 2% per annum and has assumed the current production of the Holcim Johnniefelds Quarry will have relocated to the Lynwood Quarry by 2025. The closure of Johnniefelds Quarry would lower base traffic levels on the local roads assessed, such as Brayton Road and Bypass Road. However, it would not generally reduce the Hume Highway traffic usage, other than at the intersection with Red Hills Road, as the Holcim Quarry production would be transferred to Lynwood quarry.

Peak traffic generation from the operational phase is predicted to be reached by 2025. This will incorporate ten years future traffic growth (+20%) on the Hume Highway and equivalent traffic growth on the local roads at Marulan, excluding for the existing truck traffic which is analysed separately as this is primarily quarry truck traffic.

The predicted base traffic volumes in 2025 are presented in Table 5.1. The Hume Highway daily traffic volumes from 2015 would have increased by approximately 20% by 2025 (assuming a continued 2% annual traffic growth rate).

Table 5.1 Base road network daily traffic increases (2025)

Road name	2015 daily (all traffic)	2015 daily (heavy vehicles)	Reduced Johnniefelds traffic (all vehicles)	Reduced Johnniefelds traffic (heavy vehicles)	10 year traffic growth (all traffic)	10 year traffic growth (heavy vehicles)	2025 daily traffic (all traffic)	2025 daily traffic (heavy vehicles)
Hume Highway at Penrose	22,600	4,065	-	-	4,520	813	27,120	4,878
Hume Highway at Mittagong Bypass	20,900	4,175	-	-	4,180	835	25,080	5,010
Hume Highway at Pheasants Nest	36,000	5,400	-	-	7,200	1,080	43,200	6,480
Brayton Road (west of the Bypass Road)	720	326	-160	-112	79	0	639	214
Bypass Road (north of Brayton Road)	398	221	-106	-102	35	0	327	119
Brayton Road (east of the Bypass Road)	448	99	-54	-10	70	0	464	89
Brayton Road (west of George Street)	1,130	73	-54	-10	211	0	1,287	63
George Street (south of Brayton Road)	1,750	107	-54	0	329	0	2,025	107

The estimated daily traffic volumes for the urban sections of Brayton Road and George Street at Marulan (Table 5.1) have been estimated from the peak hour intersection traffic surveys tube counts. Using the ratio between the peak hourly and the daily traffic volumes traffic determined for the nearest adjoining section of Brayton Road (Figure 2.2).

5.2 Long-term road carriageway impacts

The predicted project traffic increases for the long-term operating scenario (compared to the 2025 road network traffic volumes) are summarised in Table 5.2 and Table 5.3 for the additional project traffic for average and maximum daily production.

Table 5.2 Average longer term project traffic increases (based on 2025 daily traffic volumes)

Road name	Average daily traffic		Project daily traffic		Total daily traffic		Traffic increase (%)
Vehicle type	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**
Hume Highway at Penrose	27,120	4,878	282	276	27,402	5,154	1.0
Hume Highway at Mittagong Bypass	25,080	5,010	282	276	25,362	5,286	1.1
Hume Highway at Pheasants Nest	43,200	6,480	282	276	43,482	6,756	0.7
Brayton Road (west of the Bypass Road)	639	214	330	276	969	490	51.6
Bypass Road (north of Brayton Road)	327	119	282	276	609	395	86.2
Brayton Road (east of the Bypass Road)	464	89	48	0	512	89	10.3
Brayton Road (west of George Street)	1,287	63	48	0	1,335	63	3.7
George Street (south of Brayton Road)	2,025	107	48	0	2,073	107	2.4

Table 5.3 Maximum longer term project traffic increases (based on 2025 daily traffic volumes)

Road name	Average daily traffic		Project daily traffic		Total daily traffic		Traffic increase (%)
Vehicle type	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**	**Heavy vehicles**	**All traffic**
Hume Highway at Penrose	27,120	4,878	532	526	27,652	5,404	2.0
Hume Highway at Mittagong Bypass	25,080	5,010	532	526	25,612	5,536	2.1
Hume Highway at Pheasants Nest	43,200	6,480	532	526	43,732	7,006	1.2
Brayton Road (west of the Bypass Road)	639	214	580	526	1,219	740	90.8
Bypass Road (north of Brayton Road)	327	119	532	526	859	645	162.7
Brayton Road (east of the Bypass Road)	464	89	48	0	512	89	10.3
Brayton Road (west of George Street)	1,287	63	48	0	1,335	63	3.7
George Street (south of Brayton Road)	2,025	107	48	0	2,073	107	2.4

5.2.1 Brayton Road

It is assumed that there will be minimal project related car or truck traffic movements travelling to or from the west of Gunlake Quarry via Brayton Road. Along the sections of Brayton Road which are on the product haulage route (ie between Gunlake Quarry and the Bypass Road intersection), the average and the maximum Gunlake Quarry truck traffic usage would be 276 and 526 additional daily product truck movements in comparison to the 164 current daily truck movements. There would also be up to 54 additional daily car/other light vehicle movements Using Brayton Road.

In Table 5.2 and Table 5.3, the assessed project daily traffic increases for Brayton Road (between Gunlake Quarry and the Bypass Road) would result in 52–91% increases to the 2025 daily traffic volumes on the average and the maximum transport days respectively. With the closure of Johnniefelds Quarry, the total long-term increase in vehicle movements on Brayton Road will be less than the short-term increase (assuming 2 Mtpa production) described in Section 4.2.1.

On the other sections of Brayton Road, between the Bypass Road and Marulan, there would be no additional daily heavy vehicle traffic and the only additional project-related traffic would be cars and other light vehicles. These vehicles would result in 4–10% increases to the 2025 current daily traffic volumes.

On George Street at Marulan, the project-generated light vehicle traffic usage in 2025 would result in a 2% daily traffic increase or lower. This increase would not result in any additional requirements for the seal widening or other traffic improvements to this road.

5.2.2 Bypass Road

On the Bypass Road route, where the existing daily traffic volumes are lower than on Brayton Road, the project-generated daily traffic increases would be proportionally higher.

The additional project traffic on the Bypass Road route would result in a 86–163% increase to the 2025 daily traffic volumes (on the average and the maximum transport days).

However in 2025, the future total daily traffic usage for the Bypass Road route would remain below 1,000 daily vehicle movements and, in accordance with the Austroads (2010) *Rural Road Design Standards* (Section 2.4.3), the existing 7–8-m-wide road sealed width would continue to be adequate for this section of the haulage route.

5.2.3 Hume Highway

On the sections of the Hume Highway north of Marulan, the additional project operations traffic would increase the 2025 daily traffic volume by approximately 1% for general traffic and by 4–6% for heavy vehicles (on the average transport day) and by approximately 1–2% for general traffic and by 8–11% for heavy vehicles (on the maximum transport day).

These predicted daily traffic increases would potentially be noticeable to other traffic (in particular on a maximum transport day) but would not generally require any improvements to the road carriageway in order to accommodate the additional traffic.

In 2025, the corresponding maximum daily traffic volume for the Pheasants Nest section of the Hume Highway would increase from approximately 43,200 to 43,732 daily vehicle movements. That would be at the transition point from the range of Level of Service C to Level of Service D for the typical Hume Highway daily traffic composition (Section 2.4.2).

5.3 Long-term intersection impacts

Assessment of the project-generated intersection traffic impacts has been undertaken using SIDRA 5.1 intersection capacity analysis for the following intersections:

- the Red Hills Road Hume Highway access intersection;
- the Brayton Road and Bypass Road intersection, approximately 3 km north-west of Marulan; and
- the two intersections on the east and west sides of the Hume Highway at the South Marulan Road interchange, which is approximately 3.5 km south-west of Marulan.

The following traffic scenarios were assessed at the identified intersections:

- 2025 base traffic conditions – predicted peak hour traffic volumes allowing for traffic reductions associated with the closure of Holcim's Johnniefelds Quarry; and
- 2025 base traffic conditions with additional project traffic – predicted peak hour traffic volumes including additional project traffic volumes (maximum of 29 trucks per hour to and from Gunlake Quarry).

Summaries of the SIDRA intersection results are provided in Table 5.4 to Table 5.7.

Table 5.4 Brayton Road and Bypass Road intersection assessment (2025)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2025 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	59	16.7	B	0.025	1
	Afternoon peak hour (4.30 to 5.30 pm typically)	58	13.4	A	0.016	1
2025 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	109	19.9	B	0.093	4
	Afternoon peak hour (4.30 to 5.30 pm typically)	115	18.4	B	0.093	4

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

For all of the 2025 traffic scenarios assessed, the Brayton Road and Bypass Road intersection would operate at a very low degree of saturation (less than 0.093, ie 9% of capacity) and with a high level of service (either Level of Service A or B). There would be generally good average traffic delays (less than 20 seconds per vehicle for the most delayed right turning traffic movements) and minimal intersection queue lengths (typically less than one vehicle on any intersection approach).

Table 5.5 Red Hills Road Hume Highway intersection assessment (2025)

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2025 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	1,648	28.9	C	0.265	3
	Afternoon peak hour (4.30 to 5.30 pm typically)	1,771	16.1	B	0.253	1
2025 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	1,703	50.2	D	0.345	15
	Afternoon peak hour (4.30 to 5.30 pm typically)	1,832	78.8	F	0.477	20

Notes: *1. LoS = Level of service.*

2. DoS = Degree of saturation.

For all of the 2025 traffic scenarios investigated, the Red Hills Road intersection at the Hume Highway would operate at moderate intersection degrees of saturation (less than 0.477, ie about 48% capacity).

For the intersection movement with the highest traffic delay, the left turn from Red Hills Road onto the Hume Highway, the traffic delays would increase in future years due to the growth in northbound traffic on the Hume Highway and project related traffic growth.

In the 2025 base traffic situation, with no project traffic increases and the relocation of the Holcim quarry traffic away from the Bypass Road route, the morning and afternoon peak hour traffic delays would remain moderate (Level of Service B or C) with average intersection traffic delays of 16 to 29 seconds per vehicle.

However, the intersection traffic delay increases which would occur with the additional project traffic would change the peak hour intersection Level of Service to D or F. Thus would require traffic improvements at the intersection.

The most appropriate intersection traffic improvement to reduce the future Red Hills Road traffic delays at the intersection and eliminate any potential traffic safety related concerns with the current intersection operations, would be a northbound acceleration and merging lane for the Red Hills Road traffic. This would need to be approximately 500 m long including taper, allowing northbound Hume Highway traffic to merge with minimal delays or changing lane changing required for the merging traffic.

From the traffic capacity and Level of Service analysis, the additional intersection acceleration and merging lane would not be required until the approximately 2025. However, there would be additional traffic safety benefits from an earlier implementation of these works at this location.

Table 5.6 South Marulan Road East Side intersection assessment for 2025 traffic conditions

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2025 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	119	12.8	A	0.042	2
	Afternoon peak hour (4.30 to 5.30 pm typically)	155	14.5	A	0.038	1
2025 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	144	13.7	A	0.076	4
	Afternoon peak hour (4.30 to 5.30 pm typically)	183	14.7	B	0.071	3

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

For all of the 2025 traffic scenarios considered, the South Marulan Road interchange east side intersection would operate at a very low degree of saturation (less than 0.076, ie 8% of capacity) and with a high level of service (Level of Service either A or B).

There would be generally low average traffic delays (less than 15 seconds per vehicle) for the most delayed right turning movement which is the traffic from the Hume Highway off ramp. This includes the project truck traffic making U-turns at the interchange. There would be minimal intersection queue lengths (typically less than one vehicle on any intersection approach).

Table 5.7 South Marulan Road West Side intersection assessment for 2025 traffic conditions

Year	Peak hour	Traffic demand flow (vehicles)	Average delay (seconds)	LoS[1]	DoS[2]	Maximum queue length (m)
2025 base traffic conditions	Morning peak hour (8.00 to 9.00 am typically)	106	10.9	A	0.051	2
	Afternoon peak hour (4.30 to 5.30 pm typically)	147	9.9	A	0.042	1
2025 with additional peak hourly project traffic	Morning peak hour (8.00 to 9.00 am typically)	132	11.4	A	0.086	4
	Afternoon peak hour (4.30 to 5.30 pm typically)	178	11.3	A	0.077	3

Notes: 1. LoS = Level of service.

2. DoS = Degree of saturation.

For all of the 2025 traffic scenarios analysed, the South Marulan Road interchange west side intersection would operate at a very low degree of saturation (less than 0.086, ie 9% of capacity) and with a high level of service (Level of Service A).

There would continue to be low average traffic delays (less than 11.5 seconds per vehicle) for the most delayed right turning traffic movement from South Marulan Road westbound onto the northbound Hume Highway on ramp. This includes the project truck traffic making U-turns at the interchange. There would be minimal intersection traffic queue lengths (typically less than one vehicle on any intersection approach).

5.4 Traffic safety

The future project traffic safety impacts would be managed in accordance with the project Traffic Management Plan and Code of Conduct for all the truck drivers who are operating to and from Gunlake Quarry (see Section 4.4).

These improved traffic safety procedures, when combined with the future localised program of road improvements for the haulage route identified by this assessment and described in Table 6.1, will provide an appropriate level of future traffic safety for the haulage route.

5.5 Road pavement and maintenance impacts

A recent visual pavement condition assessment (Appendix B) has been undertaken by EMM which confirms the generally good current condition of the road pavements along the product haulage route.

A summary has been provided in Table 4.9 of the future estimated costs and revenues for the Council from the Section 94 development contributions plan as currently defined for Gunlake's contribution to the haulage route maintenance.

The Council has expressed a desire for the current Section 94 plan to be reviewed and updated in response to the substantially increased quarry production rate of 2,000,000 tonnes per annum which is now proposed.

However it generally evident from the current contributions which are payable by Gunlake (as documented in the Land and Environment Court of NSW Case number 11116 of 2008) that these contributions already exceed the actual costs to the Council to maintain the haulage route, so any future review would potentially be likely to reduce, rather than increase, the section 94 contributions which would be payable by Gunlake to the Council in the future.

6 Mitigation measures

6.1 Road and intersection improvements

The traffic and intersection capacity and road safety analysis has identified a number of road and intersection improvements which would mitigate the likely impacts of the project traffic (primarily the additional heavy vehicle traffic movements) in the Marulan area.

6.1.1 Improvements to be implemented by Gunlake Quarries

The proposed road and intersection improvements to be implemented by Gunlake Quarries to mitigate the impacts of the increased Gunlake Quarry traffic are described in Table 6.1.

Table 6.1 Summary of proposed road and intersection improvements

Item	Location	Timing	Existing road width and condition	Proposed improvement
1	The intersection at the Hume Highway and Red Hills Road	As soon as feasible (before 2025)	The existing intersection has a left turn deceleration lane but no left turn acceleration lane for the northbound quarry trucks which are turning onto the Hume Highway.	An additional left turn acceleration lane is required with a length of 500 m (including taper) for the future quarry truck traffic to safely merge with the northbound Hume Highway traffic. The acceleration lane should be constructed in accordance with intersection design requirements currently Austroads (2013).

6.2 Traffic management plan

A traffic management plan, incorporating a driver code of conduct, has been prepared for the existing Gunlake Quarry transport operations and would also be applicable to the proposed quarry extension. The traffic management plan addresses the Project approval conditions which relate to the quarry transport operations and describes measures related to:

- maximising safety for the travelling public and all light and heavy vehicle operations related to the Project;
- ensuring compliance with all State and Commonwealth road transport legislation and regulatory requirements;
- managing driver fatigue; and
- responding to any product haulage route incident or emergency.

The plan would be renewed following approval of the extension project in accordance with the current project traffic management plan guidelines.

7 Conclusion

7.1 Goulburn Mulwaree Council requests

The proposed road and intersection improvements in Table 6.1 would address all of the identified traffic safety, Level of Service, road pavement and maintenance impacts from the Gunlake Extension Project traffic during construction and operational phases.

A further summary is provided in Table 7.1 of the future maintenance requirements and investigations for the haulage route which have been requested by Goulburn Mulwaree Council and how these requirements will be addressed.

Table 7.1 Goulburn Mulwaree road pavement maintenance requirements

Council requirement	How requirement will be addressed
Council's s94 development contributions Plan requires payment of a contribution in accordance with the formula given in the document. The 2015/16 rate is 0.462/tonne/km, although Council has reviewed the current plan and is preparing appropriate amendments that will impact on the contribution rate.	The existing s94 development contributions plan is considered to be adequate to fund future road maintenance. It may potentially even road upgrade or reconstruction works on the haulage route, as it is based on a per tonne km rate so the contributions would automatically increase in line with the increased quarry truck traffic.
Section 94 contributions will not be used to fund direct works to comply with the DCP [Goulburn Mulwaree Development Control Plan 2009] or development consent conditions that are required to bring roads up to a suitable standard to commence operations such as: a) road widening; b) pavement upgrading (a pavement shall have a minimum remaining life of 10 years); c) geometric improvements; d) drainage works; and intersection improvements.	The existing s94 development contribution plan is considered to be adequate to fund future road maintenance and potentially even road upgrade or reconstruction works on the haulage route, as it is based on a per tonne km rate so the contributions would automatically increase in line with the increased quarry truck traffic. Not withstanding this situation, the right of the Council to review the plan is accepted and Gunlake will work with the Council in negotiations related to possible future amendments to the plan.
With regard to the 10 year minimum remaining life, the roads (including relatively new Ambrose Road) would require testing to ensure their capability of handling the increased heavy vehicle movements.	The pavement remaining life has recently been assessed by pavement structural testing and was calculated as a minimum of 20 years typically based on the current predicted truck movements levels for the route (for the stage 2 project approvals).
Council considers that as in this case, where the heavy vehicle movements are particularly large, that the requirements of these documents should be regarded as a bare minimum.	Noted
Council would like to see what mechanism/s the proponents are going to rely on to record and validate their extraction rates and environmental impacts, and should the development be recommended for approval by the Department, that the extraction rates are reported to NSW Trade and Investment.	Noted
Council is also seeking the plan of management for the development to include an 80 km/h maximum speed limit on local roads for haulage vehicles.	Noted

7.2 Feasibility of rail transport

Potential future rail transport from the quarry has been investigated and found not to be feasible as the quarry does not currently have direct access to the Main Southern Railway Line. In addition, due to the difficult terrain, there will be a high capital cost and high potential local environmental impacts resulting from the future construction of rail access.

Future transport of the Gunlake Quarry products by rail to customers in the Sydney Metropolitan area would also require a separate transfer station to be established with rail unloading and product storage facilities, somewhere within either the Liverpool or Bankstown local government areas. This would further increase both the capital and the ongoing cost requirements for the future use of rail transport as an alternative to road transport over the lifetime of the project.

References

Austroads 1988, *Guide to Traffic Engineering Practice-Part 2 Roadway Capacity*.

Austroads 2010, *Guide to Road Design.*

Austroads 2013, *Guide to Traffic Management Part 6 Intersections, Interchanges and Crossings.*

National Association of Australian State Road Authorities (NAASRA) 1984, *Rural Arterial Roads Report.*

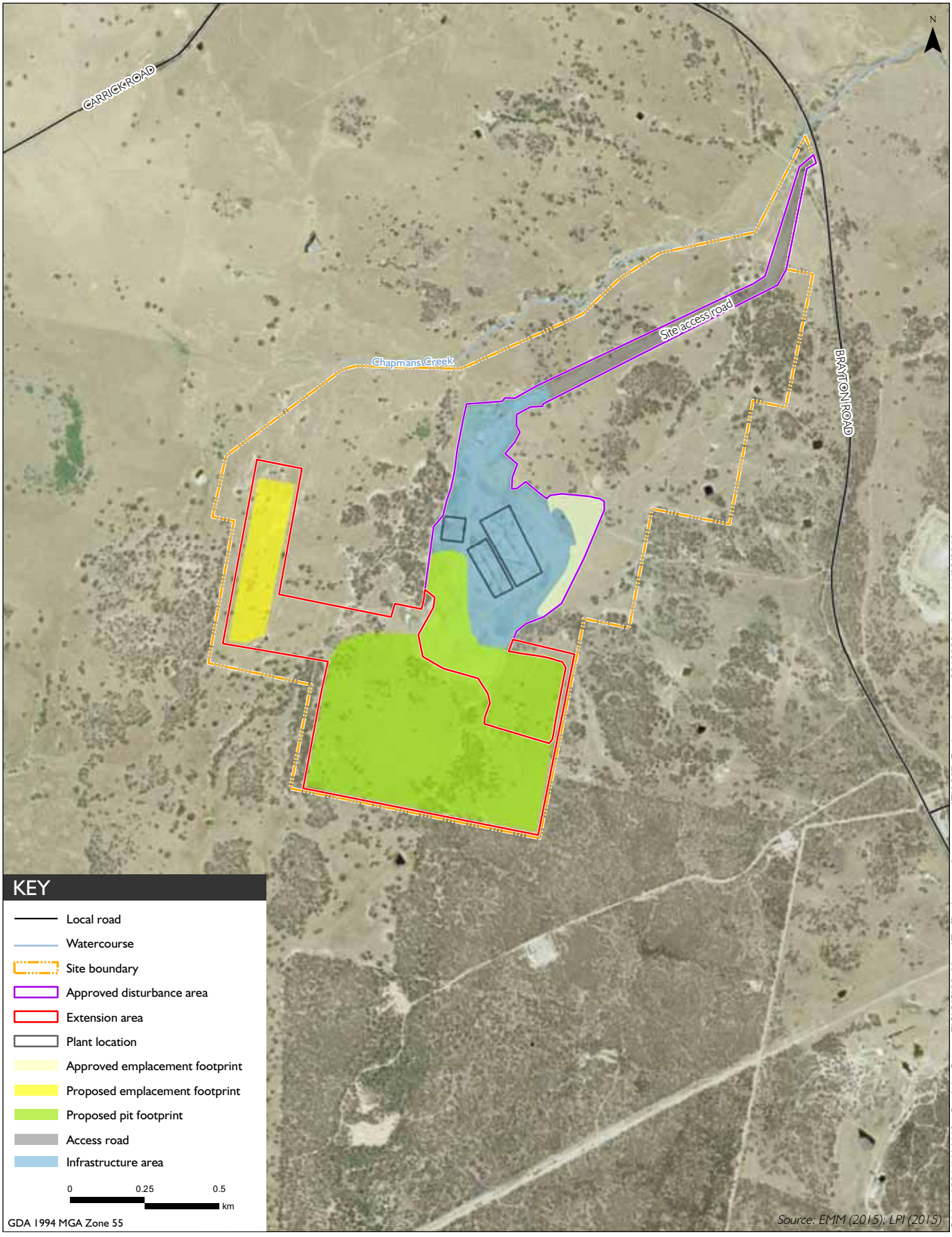
Pavement Management Services 2014, *Pavement Remaining Life Report: Brayton & Red Hills Road*, October 2014.

Roads and Traffic Authority (RTA) 2005 and 2012, *Annual Average Daily Traffic Volume Data for NSW.*

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

Appendix A

Development Plans



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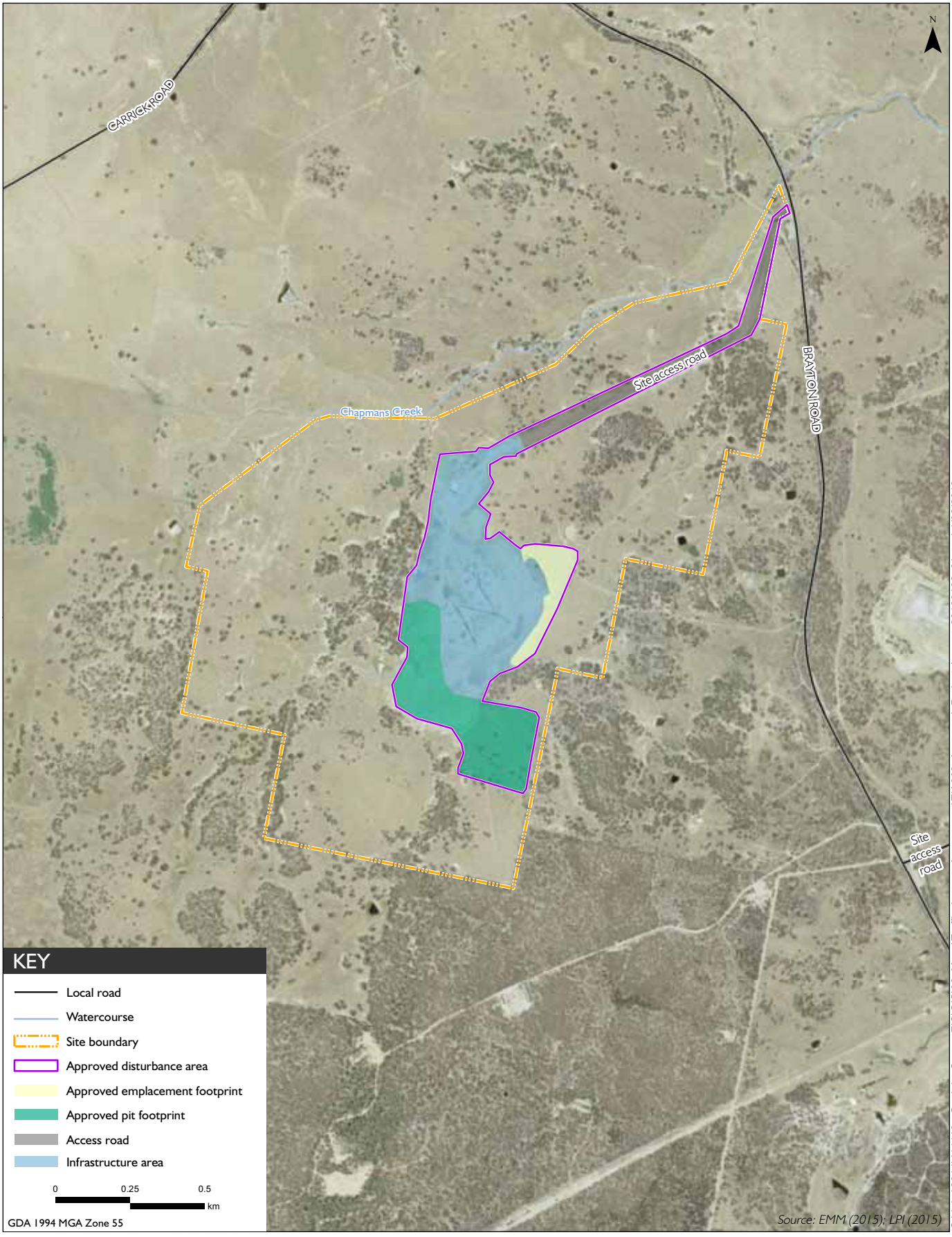
Indicative proposed project layout

Gunlake Quarry
Transport Assessment

Figure A.1



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Approved project layout

Gunlake Quarry
Transport Assessment

Figure A.2

Appendix B

Typical Road Width Sections

Intersection of Brayton Road and Stoney Creek Road looking west

Bridge on Brayton Road looking north

Brayton Road looking north

Brayton Road looking south

Brayton Road looking south

Brayton Road looking south towards the bridge

Intersection of Brayton Road and Stoney Creek Road looking south

Brayton Road looking east

Brayton Road looking east towards the intersection with George Street

Brayton Road at the intersection to Bypass Road looking north-west

Brayton Road looking north-west

Brayton Road looking north-west

Bus stop bay on Brayton Road looking north-west

Brayton Road looking north-west

Entry to Gunlake Quarry on Brayton Road looking north-west

Internal haul road at Gunlake Quarry looking north

Internal haul road intersection with Brayton Road looking east

Brayton Road looking south-east

Brayton Road looking south-east

Brayton Road looking south-east

Brayton Road looking south-east at house driveway

Brayton Road looking south-east

Brayton Road looking south-east near Johnniefelds Quarry

Brayton Road looking south-east

Brayton Road and Bypass Road intersection looking south east

Bypass Road looking north

Bypass Road looking east

Red Hills Road looking east

End of Red Hills Road looking east towards the intersection with the Hume Highway

Red Hills Road looking west

Red Hills Road looking west

Bypass Road looking west

Bypass Road looking west

Bypass Road looking west

Hume Highway looking north near Sutton Forest

Hume Highway looking south near Sutton Forest

Appendix C

Tube Traffic Counts

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Traffic Count Summary Report

Count Number 2529 Ref : EMM **Lat/Long : S34 39.937 / E149 58.327** **GOOGLE MAP**

Street **GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**

Location South of Brayton Road, On No Overtaking Sign *Carriageway*

TOTAL COUNT MATRIX

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	46
Weekly 85th Percentile Speed	66
Five Day AADT	238
Seven Day AADT	182

	MON *17TH / 24TH*	TUE *18TH*	WED *19TH*	THU *20TH*	FRI *21ST*	SAT *22ND*	SUN *23RD*	5 Dav Total	5 Dav Average	7 Dav Total	7 Dav Average
Midnight - 1am	0	4	4	4	4	0	0	**16**	**3**	**16**	**2**
1am - 2am	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
2am - 3am	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
3am - 4am	0	0	1	1	3	0	0	**5**	**1**	**5**	**1**
4am - 5am	4	3	4	2	1	0	0	**14**	**3**	**14**	**2**
5am - 6am	**18**	**37**	30	**32**	**40**	**21**	**1**	**157**	**31**	**179**	**26**
6am - 7am	6	31	19	26	25	9	0	**107**	**21**	**116**	**17**
7am - 8am	9	8	**31**	12	5	5	0	**65**	**13**	**70**	**10**
8am - 9am	15	17	15	20	10	5	0	**77**	**15**	**82**	**12**
9am - 10am	12	16	23	10	15	6	0	**76**	**15**	**82**	**12**
10am - 11am	7	31	22	27	39	12	**1**	**126**	**25**	**139**	**20**
11am - Midday	14	24	27	19	24	3	**1**	**108**	**22**	**112**	**16**
Midday - 1pm	15	18	14	**15**	17	3	0	**79**	**16**	**82**	**12**
1pm - 2pm	15	24	16	**15**	**20**	**7**	0	**90**	**18**	**97**	**14**
2pm - 3pm	**23**	**28**	**21**	14	12	4	0	**98**	**20**	**102**	**15**
3pm - 4pm	13	17	11	11	10	2	0	**62**	**12**	**64**	**9**
4pm - 5pm	16	12	12	10	8	1	**2**	**58**	**12**	**61**	**9**
5pm - 6pm	7	7	4	8	1	1	0	**27**	**5**	**28**	**4**
6pm - 7pm	2	2	3	6	2	0	0	**15**	**3**	**15**	**2**
7pm - 8pm	2	0	0	1	2	0	0	**5**	**1**	**5**	**1**
8pm - 9pm	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
9pm - 10pm	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
10pm - 11pm	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
11pm - Midnight	0	0	0	0	4	0	0	**4**	**1**	**4**	**1**
Total	**178**	**279**	**257**	**233**	**242**	**79**	**5**	**1189**	**237**	**1273**	**181**

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Traffic Count Summary Report

Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, (	*Carriageway*		

TOTAL COUNT MATRIX

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	74
Weekly 85th Percentile Speed	91
Five Day AADT	720
Seven Day AADT	626

	MON *17TH / 24TH*	TUE *18TH*	WED *19TH*	THU *20TH*	FRI *21ST*	SAT *22ND*	SUN *23RD*	5 Dav Total	5 Dav Average	7 Dav Total	7 Dav Average
Midnight - 1am	1	5	5	6	5	5	6	**22**	**4**	**33**	**5**
1am - 2am	1	0	1	1	0	0	4	**3**	**1**	**7**	**1**
2am - 3am	1	1	0	2	1	0	1	**5**	**1**	**6**	**1**
3am - 4am	2	1	2	3	1	0	0	**9**	**2**	**9**	**1**
4am - 5am	4	13	8	10	8	1	1	**43**	**9**	**45**	**6**
5am - 6am	33	52	50	46	60	32	6	**241**	**48**	**279**	**40**
6am - 7am	37	64	35	**63**	56	18	3	**255**	**51**	**276**	**39**
7am - 8am	42	**65**	**64**	57	47	30	8	**275**	**55**	**313**	**45**
8am - 9am	38	58	62	54	68	30	11	**280**	**56**	**321**	**46**
9am - 10am	42	39	59	36	55	25	23	**231**	**46**	**279**	**40**
10am - 11am	31	46	57	59	**88**	**49**	21	**281**	**56**	**351**	**50**
11am - Midday	**48**	62	61	60	62	35	**30**	**293**	**59**	**358**	**51**
Midday - 1pm	33	42	43	58	**64**	40	22	**240**	**48**	**302**	**43**
1pm - 2pm	60	51	39	33	51	31	30	**234**	**47**	**295**	**42**
2pm - 3pm	**63**	**59**	49	53	52	**43**	21	**276**	**55**	**340**	**49**
3pm - 4pm	34	50	36	51	61	34	33	**232**	**46**	**299**	**43**
4pm - 5pm	52	44	**54**	**59**	54	19	**34**	**263**	**53**	**316**	**45**
5pm - 6pm	41	28	48	44	36	29	20	**197**	**39**	**246**	**35**
6pm - 7pm	17	10	20	20	24	16	13	**91**	**18**	**120**	**17**
7pm - 8pm	5	9	13	8	11	7	13	**46**	**9**	**66**	**9**
8pm - 9pm	7	7	4	4	19	8	4	**41**	**8**	**53**	**8**
9pm - 10pm	4	1	3	3	6	8	6	**17**	**3**	**31**	**4**
10pm - 11pm	1	2	4	3	5	3	2	**15**	**3**	**20**	**3**
11pm - Midnight	1	3	1	1	6	4	3	**12**	**2**	**19**	**3**
Total	**598**	**712**	**718**	**734**	**840**	**467**	**315**	**3602**	**720**	**4384**	**626**

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Traffic Count Summary Report

Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177** **GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**		
Location	Just east of bend south near Brayton Road, on Guard Rail.		*Carriageway*

TOTAL COUNT MATRIX

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	86
Weekly 85th Percentile Speed	96
Five Day AADT	398
Seven Day AADT	326

	MON *17TH / 24TH*	TUE *18TH*	WED *19TH*	THU *20TH*	FRI *21ST*	SAT *22ND*	SUN *23RD*	5 Dav Total	5 Dav Average	7 Dav Total	7 Dav Average
Midnight - 1am	0	1	1	1	2	1	1	**5**	**1**	**7**	**1**
1am - 2am	0	0	0	0	0	0	1	**0**	**0**	**1**	**0**
2am - 3am	1	1	0	1	1	0	0	**4**	**1**	**4**	**1**
3am - 4am	0	0	1	2	1	0	1	**4**	**1**	**5**	**1**
4am - 5am	3	11	7	3	10	2	0	**34**	**7**	**36**	**5**
5am - 6am	19	30	24	31	39	18	2	**143**	**29**	**163**	**23**
6am - 7am	27	**48**	42	**50**	36	12	0	**203**	**41**	**215**	**31**
7am - 8am	**31**	41	**64**	38	21	24	7	**195**	**39**	**226**	**32**
8am - 9am	21	28	30	28	34	12	3	**141**	**28**	**156**	**22**
9am - 10am	24	30	51	28	53	10	7	**186**	**37**	**203**	**29**
10am - 11am	20	45	32	34	**74**	**25**	7	**205**	**41**	**237**	**34**
11am - Midday	19	39	34	36	31	15	**14**	**159**	**32**	**188**	**27**
Midday - 1pm	12	27	22	**28**	24	5	6	**113**	**23**	**124**	**18**
1pm - 2pm	3	34	19	18	24	8	8	**98**	**20**	**114**	**16**
2pm - 3pm	**41**	**38**	24	**28**	**32**	**13**	11	**163**	**33**	**187**	**27**
3pm - 4pm	27	31	**27**	25	24	8	10	**134**	**27**	**152**	**22**
4pm - 5pm	28	24	21	19	15	12	**14**	**107**	**21**	**133**	**19**
5pm - 6pm	6	12	11	12	7	12	4	**48**	**10**	**64**	**9**
6pm - 7pm	2	3	2	3	4	3	6	**14**	**3**	**23**	**3**
7pm - 8pm	2	5	2	0	0	2	3	**9**	**2**	**14**	**2**
8pm - 9pm	1	1	4	1	2	0	1	**9**	**2**	**10**	**1**
9pm - 10pm	1	2	1	3	1	1	1	**8**	**2**	**10**	**1**
10pm - 11pm	1	1	1	2	0	1	1	**5**	**1**	**7**	**1**
11pm - Midnight	0	1	0	0	1	1	0	**2**	**0**	**3**	**0**
Total	**289**	**453**	**420**	**391**	**436**	**185**	**108**	**1989**	**397**	**2282**	**326**

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Traffic Count Summary Report

Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

TOTAL COUNT MATRIX

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	84
Weekly 85th Percentile Speed	98
Five Day AADT	448
Seven Day AADT	417

	MON *17TH / 24TH*	TUE *18TH*	WED *19TH*	THU *20TH*	FRI *21ST*	SAT *22ND*	SUN *23RD*	5 Dav Total	5 Dav Average	7 Dav Total	7 Dav Average
Midnight - 1am	1	3	4	6	3	4	7	**17**	**3**	**28**	**4**
1am - 2am	1	0	1	1	0	0	3	**3**	**1**	**6**	**1**
2am - 3am	0	0	0	0	0	0	1	**0**	**0**	**1**	**0**
3am - 4am	3	1	1	1	0	0	1	**6**	**1**	**7**	**1**
4am - 5am	2	3	1	2	3	2	1	**11**	**2**	**14**	**2**
5am - 6am	21	25	25	26	28	16	4	**125**	**25**	**145**	**21**
6am - 7am	13	16	15	20	7	7	3	**71**	**14**	**81**	**12**
7am - 8am	24	33	25	**36**	35	15	10	**153**	**31**	**178**	**25**
8am - 9am	28	**39**	**43**	30	**44**	27	11	**184**	**37**	**222**	**32**
9am - 10am	26	18	25	22	27	17	25	**118**	**24**	**160**	**23**
10am - 11am	30	15	33	19	29	**37**	22	**126**	**25**	**185**	**26**
11am - Midday	**32**	31	38	31	43	**37**	**32**	**175**	**35**	**244**	**35**
Midday - 1pm	25	32	29	40	**45**	36	15	**171**	**34**	**222**	**32**
1pm - 2pm	22	27	29	24	32	32	**29**	**134**	**27**	**195**	**28**
2pm - 3pm	37	29	32	33	37	**40**	18	**168**	**34**	**226**	**32**
3pm - 4pm	25	36	24	43	41	35	27	**169**	**34**	**231**	**33**
4pm - 5pm	**40**	**44**	**45**	**52**	**45**	18	24	**226**	**45**	**268**	**38**
5pm - 6pm	34	20	41	33	33	24	17	**161**	**32**	**202**	**29**
6pm - 7pm	17	9	21	24	26	21	9	**97**	**19**	**127**	**18**
7pm - 8pm	3	8	15	8	11	7	10	**45**	**9**	**62**	**9**
8pm - 9pm	6	8	4	6	19	7	5	**43**	**9**	**55**	**8**
9pm - 10pm	3	1	2	1	7	9	5	**14**	**3**	**28**	**4**
10pm - 11pm	0	1	3	3	5	3	1	**12**	**2**	**16**	**2**
11pm - Midnight	1	2	1	1	5	3	3	**10**	**2**	**16**	**2**
Total	**394**	**401**	**457**	**462**	**525**	**397**	**283**	**2239**	**447**	**2919**	**417**

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Traffic Count Summary Report

Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	800 Meters, from Gunlake Mine access, on Tree.		*Carriageway*

TOTAL COUNT MATRIX

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	88
Weekly 85th Percentile Speed	103
Five Day AADT	278
Seven Day AADT	279

	MON *17TH / 24TH*	TUE *18TH*	WED *19TH*	THU *20TH*	FRI *21ST*	SAT *22ND*	SUN *23RD*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	1	0	1	2	1	4	6	**5**	**1**	**15**	**2**
1am - 2am	1	0	1	1	0	1	5	**3**	**1**	**9**	**1**
2am - 3am	1	1	0	1	1	0	0	**4**	**1**	**4**	**1**
3am - 4am	2	2	1	2	0	0	0	**7**	**1**	**7**	**1**
4am - 5am	2	3	3	3	5	1	1	**16**	**3**	**18**	**3**
5am - 6am	6	11	5	7	7	3	5	**36**	**7**	**44**	**6**
6am - 7am	8	7	7	9	6	5	3	**37**	**7**	**45**	**6**
7am - 8am	21	**31**	17	19	24	9	6	**112**	**22**	**127**	**18**
8am - 9am	17	25	**26**	**24**	24	14	9	**116**	**23**	**139**	**20**
9am - 10am	21	12	11	12	11	16	16	**67**	**13**	**99**	**14**
10am - 11am	18	10	19	19	**27**	**29**	17	**93**	**19**	**139**	**20**
11am - Midday	**26**	18	19	10	17	22	**26**	**90**	**18**	**138**	**20**
Midday - 1pm	16	17	19	20	**34**	26	19	**106**	**21**	**151**	**22**
1pm - 2pm	23	16	17	15	19	26	25	**90**	**18**	**141**	**20**
2pm - 3pm	**26**	19	13	8	25	27	20	**91**	**18**	**138**	**20**
3pm - 4pm	22	17	18	25	29	**31**	26	**111**	**22**	**168**	**24**
4pm - 5pm	18	**20**	**34**	**32**	26	18	**27**	**130**	**26**	**175**	**25**
5pm - 6pm	14	17	26	26	27	22	17	**110**	**22**	**149**	**21**
6pm - 7pm	10	6	13	13	17	14	14	**59**	**12**	**87**	**12**
7pm - 8pm	4	6	11	7	10	8	12	**38**	**8**	**58**	**8**
8pm - 9pm	4	7	4	2	13	5	3	**30**	**6**	**38**	**5**
9pm - 10pm	4	1	2	3	6	7	5	**16**	**3**	**28**	**4**
10pm - 11pm	1	2	5	3	5	2	1	**16**	**3**	**19**	**3**
11pm - Midnight	1	3	1	1	2	5	3	**8**	**2**	**16**	**2**
Total	**267**	**251**	**273**	**264**	**336**	**295**	**266**	**1391**	**278**	**1952**	**278**

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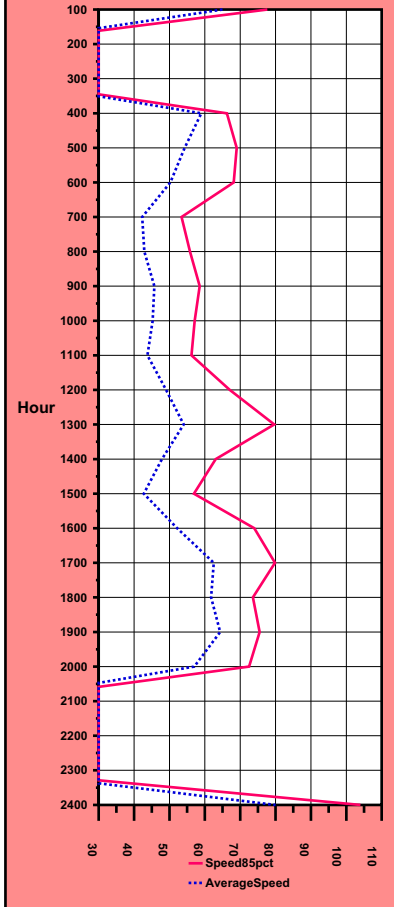
Hourly Speed Summary

Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly Mean Speed	**49**
Weekly 85th Percentile Speed	**66**
Five Day AADT	**238**
Seven Day AADT	**182**

Time	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	Total	Mean	85pct
Midnight - 1am	0	0	0	1	0	6	2	6	0	1	0	0	**16**	65.0	77.7
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
3am - 4am	0	0	0	0	0	3	2	0	0	0	0	0	**5**	59.0	66.3
4am - 5am	0	0	0	3	2	6	1	1	0	1	0	0	**14**	54.3	69.0
5am - 6am	0	1	7	42	54	31	21	16	4	2	1	0	**179**	50.3	68.2
6am - 7am	1	6	10	33	44	11	4	2	1	3	0	0	**115**	42.3	53.4
7am - 8am	0	5	4	17	24	12	3	1	0	1	0	0	**67**	42.9	55.8
8am - 9am	0	2	2	20	32	16	10	0	0	0	0	0	**82**	45.7	58.6
9am - 10am	0	0	7	22	35	8	4	2	4	0	0	0	**82**	45.2	57.1
10am - 11am	1	1	10	42	49	23	8	3	1	0	0	0	**138**	43.8	56.2
11am - Midday	0	1	5	31	31	20	9	8	5	0	0	1	**111**	49.1	67.1
Midday - 1pm	0	0	1	19	26	13	3	8	8	4	0	0	**82**	54.0	79.6
1pm - 2pm	0	1	9	25	29	16	8	2	2	3	1	1	**97**	47.9	63.1
2pm - 3pm	0	4	9	36	28	14	9	0	1	0	0	1	**102**	42.7	56.9
3pm - 4pm	0	3	5	7	16	15	6	6	3	3	0	0	**64**	52.2	74.0
4pm - 5pm	0	0	0	2	11	18	11	10	6	3	0	0	**61**	62.5	79.9
5pm - 6pm	0	0	0	0	4	8	10	5	1	0	0	0	**28**	61.8	73.6
6pm - 7pm	0	0	0	0	1	4	5	5	0	0	0	0	**15**	64.3	75.5
7pm - 8pm	0	0	0	0	2	1	1	1	0	0	0	0	**5**	57.0	72.5
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
11pm - Midnigh	0	0	0	0	0	0	2	0	1	0	1	0	**4**	80.0	104.0
Total	2	24	69	300	388	225	119	76	37	21	3	3	**1267**		
% of Total		2	5	24	31	18	9	6	3	2					



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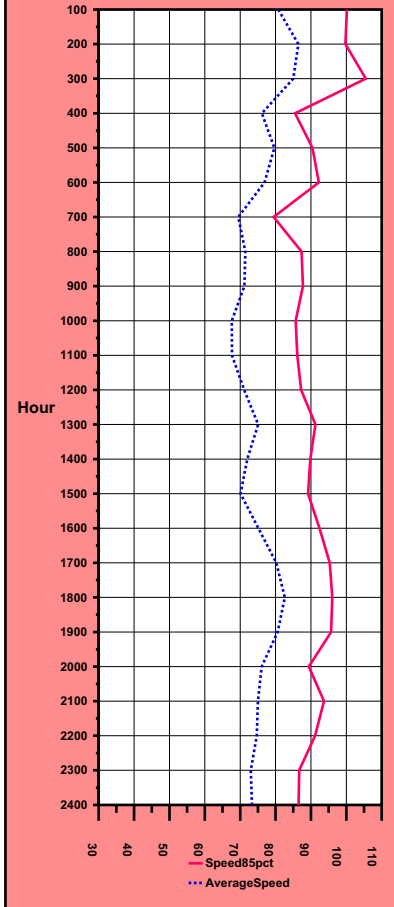
Hourly Speed Summary

Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on - *Carriageway*		

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly Mean Speed	**73**
Weekly 85th Percentile Speed	**91**
Five Day AADT	**720**
Seven Day AADT	**626**

Time	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	Total	Mean	85pct
Midnight - 1am	0	0	0	0	0	3	3	14	5	3	3	2	**33**	80.8	100.2
1am - 2am	0	0	0	0	0	0	1	1	2	2	1	0	**7**	86.4	99.8
2am - 3am	0	0	0	0	0	0	2	0	2	0	2	0	**6**	85.0	105.5
3am - 4am	0	0	0	0	0	0	2	4	3	0	0	0	**9**	76.1	85.5
4am - 5am	0	0	0	0	0	0	4	24	10	6	1	0	**45**	79.7	90.4
5am - 6am	0	0	0	0	4	24	65	77	59	29	16	3	**277**	76.9	92.2
6am - 7am	0	0	0	4	5	43	93	95	22	8	5	1	**276**	69.5	79.4
7am - 8am	0	0	2	4	16	38	85	88	45	28	5	2	**313**	71.5	87.3
8am - 9am	0	2	3	3	29	27	75	92	54	29	7	0	**321**	71.2	87.8
9am - 10am	0	6	4	11	22	33	76	63	39	16	5	4	**279**	67.6	85.7
10am - 11am	0	4	7	13	24	52	103	65	48	18	14	2	**350**	67.7	86.1
11am - Midday	0	2	3	8	15	45	96	84	71	26	4	4	**358**	71.1	87.2
Midday - 1pm	0	0	1	1	17	27	60	84	61	38	9	3	**301**	75.1	91.3
1pm - 2pm	0	1	1	9	20	30	75	58	56	33	8	2	**293**	72.0	89.8
2pm - 3pm	0	1	5	11	29	41	76	81	48	39	4	4	**339**	70.1	89.2
3pm - 4pm	0	1	2	4	10	27	64	83	55	34	15	4	**299**	75.1	92.4
4pm - 5pm	0	0	0	0	5	18	48	84	86	52	19	4	**316**	80.2	95.3
5pm - 6pm	0	0	2	0	1	4	23	72	74	55	13	2	**246**	82.6	96.0
6pm - 7pm	0	0	0	0	1	7	19	29	34	21	9	0	**120**	80.6	95.7
7pm - 8pm	0	0	0	0	2	5	13	22	15	6	3	0	**66**	76.1	89.4
8pm - 9pm	0	0	0	0	3	6	14	8	10	11	1	0	**53**	75.0	93.7
9pm - 10pm	0	0	0	0	1	7	2	10	6	3	2	0	**31**	74.7	91.2
10pm - 11pm	0	0	0	0	0	5	3	5	6	0	1	0	**20**	73.0	86.7
11pm - Midnigh	0	0	0	0	1	2	3	8	2	1	1	0	**18**	73.3	86.5
Total	0	17	30	68	205	444	1005	1151	813	458	148	37	**4376**		
% of Total			1	2	5	10	23	26	19	10	3	1			



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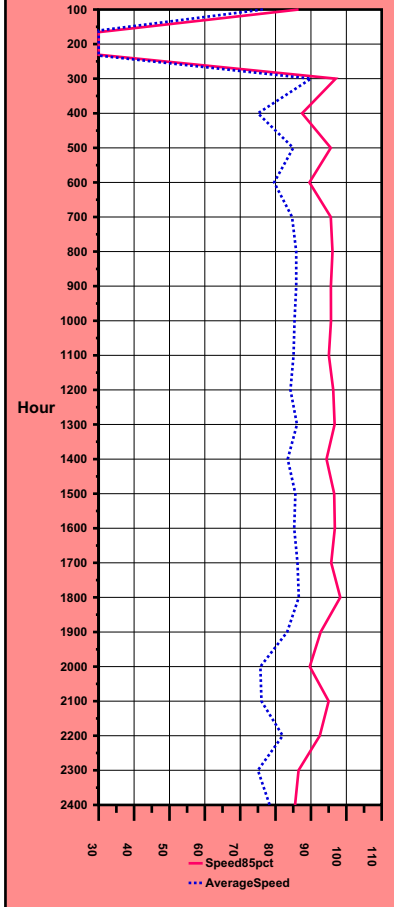
Hourly Speed Summary

Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly Mean Speed	**85**
Weekly 85th Percentile Speed	**96**
Five Day AADT	**398**
Seven Day AADT	**326**

Time	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	Total	Mean	85pct
Midnight - 1am	0	0	0	0	0	0	2	2	3	0	0	0	**7**	76.4	86.5
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0		.0	.0
2am - 3am	0	0	0	0	0	0	0	0	2	2	0	0	**4**	90.0	97.0
3am - 4am	0	0	0	0	0	1	1	0	3	0	0	0	**5**	75.0	87.5
4am - 5am	0	0	0	0	0	0	2	8	15	10	1	0	**36**	85.0	95.6
5am - 6am	0	0	0	0	1	4	17	60	59	22	0	0	**163**	79.6	89.6
6am - 7am	0	0	0	0	0	1	18	40	89	62	5	0	**215**	84.7	95.6
7am - 8am	0	0	0	0	0	2	5	49	91	74	5	0	**226**	85.8	96.1
8am - 9am	0	0	0	0	0	0	4	33	77	33	6	3	**156**	85.8	95.6
9am - 10am	0	0	0	0	1	2	6	40	91	56	5	1	**202**	85.3	95.7
10am - 11am	0	0	0	0	0	3	7	49	111	62	3	2	**237**	85.1	95.1
11am - Midday	0	0	0	0	3	2	11	44	74	41	11	2	**188**	84.2	96.3
Midday - 1pm	0	0	0	0	0	2	4	23	57	29	6	3	**124**	86.0	96.7
1pm - 2pm	0	0	0	1	0	0	11	26	51	18	4	3	**114**	83.4	94.4
2pm - 3pm	0	0	0	1	0	3	7	35	74	58	8	0	**186**	85.6	96.6
3pm - 4pm	0	0	0	0	0	1	11	31	59	39	9	1	**151**	85.3	96.8
4pm - 5pm	0	0	0	0	0	2	1	23	67	35	3	2	**133**	86.2	95.7
5pm - 6pm	0	0	0	0	0	4	3	5	25	21	6	0	**64**	86.6	98.3
6pm - 7pm	0	0	0	0	0	1	1	5	12	2	2	0	**23**	83.3	92.8
7pm - 8pm	0	0	0	0	0	2	3	4	3	1	1	0	**14**	75.7	89.7
8pm - 9pm	0	0	0	0	0	1	4	2	1	1	0	1	**10**	76.0	95.0
9pm - 10pm	0	0	0	0	0	0	1	3	4	2	0	0	**10**	82.0	92.5
10pm - 11pm	0	0	0	0	0	1	1	2	3	0	0	0	**7**	75.0	86.5
11pm - Midnigh	0	0	0	0	0	0	0	2	1	0	0	0	**3**	78.3	85.5
Total	0	0	0	2	5	32	120	486	972	568	75	18	**2278**		
% of Total						1	5	21	43	25	3	1			



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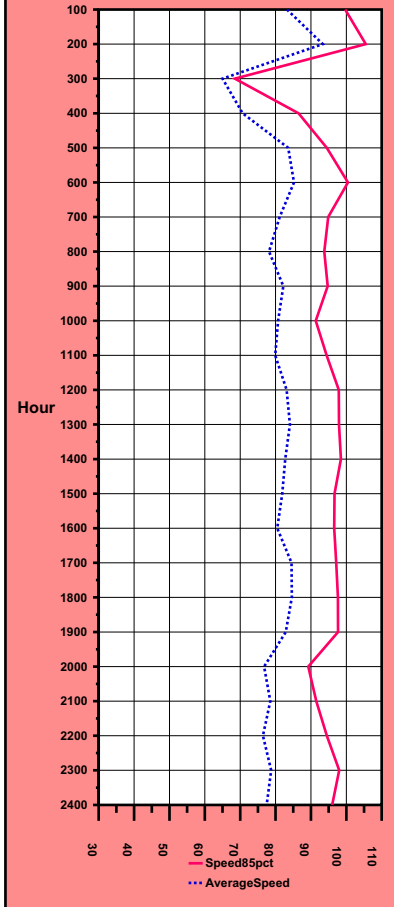
Hourly Speed Summary

Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.			*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly Mean Speed	**82**
Weekly 85th Percentile Speed	**98**
Five Day AADT	**448**
Seven Day AADT	**417**

Time	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	Total	Mean	85pct
Midnight - 1am	0	0	0	0	0	1	4	8	5	6	4	0	**28**	83.2	99.7
1am - 2am	0	0	0	0	0	0	0	1	1	2	2	0	**6**	93.3	105.5
2am - 3am	0	0	0	0	0	0	1	0	0	0	0	0	**1**	65.0	68.5
3am - 4am	0	0	1	0	0	0	1	2	3	0	0	0	**7**	70.7	86.5
4am - 5am	0	0	0	0	1	0	0	2	8	2	1	0	**14**	83.6	94.5
5am - 6am	0	0	0	0	0	10	11	34	27	38	15	7	**142**	85.2	100.5
6am - 7am	0	0	0	0	1	1	12	24	24	14	5	0	**81**	81.2	94.9
7am - 8am	0	0	0	0	4	17	25	56	41	22	10	3	**178**	78.1	93.8
8am - 9am	0	0	0	0	1	3	23	68	73	40	11	1	**220**	82.2	94.7
9am - 10am	0	0	0	0	2	1	19	58	53	16	7	3	**159**	80.7	91.3
10am - 11am	0	0	0	0	3	10	32	43	56	28	9	3	**184**	79.9	94.4
11am - Midday	0	0	0	2	1	6	26	65	71	43	20	7	**241**	83.1	97.9
Midday - 1pm	0	0	0	0	2	5	24	52	70	45	15	9	**222**	84.1	97.9
1pm - 2pm	0	0	0	1	2	11	24	43	50	41	17	6	**195**	82.7	98.5
2pm - 3pm	0	0	0	0	4	15	22	52	65	46	12	6	**222**	81.9	96.7
3pm - 4pm	0	0	0	2	5	17	30	52	58	48	13	5	**230**	80.5	96.6
4pm - 5pm	0	0	0	0	0	6	21	64	93	60	18	5	**267**	84.5	97.2
5pm - 6pm	0	0	0	0	3	4	9	53	66	46	16	3	**200**	84.6	97.6
6pm - 7pm	0	0	0	0	0	3	18	37	27	30	11	1	**127**	82.9	97.7
7pm - 8pm	0	0	1	0	0	1	17	18	17	6	2	0	**62**	76.8	89.2
8pm - 9pm	0	0	0	0	0	3	13	13	16	6	2	1	**54**	78.5	91.5
9pm - 10pm	0	0	0	0	0	5	5	7	5	4	2	0	**28**	76.4	94.5
10pm - 11pm	0	0	0	0	1	1	3	4	3	2	1	1	**16**	78.8	98.0
11pm - Midnigh	0	0	0	0	0	2	3	6	2	1	1	1	**16**	77.5	96.0
Total	0	0	2	5	30	122	343	762	834	546	194	62	**2900**		
% of Total					1	4	12	26	29	19	7	2			



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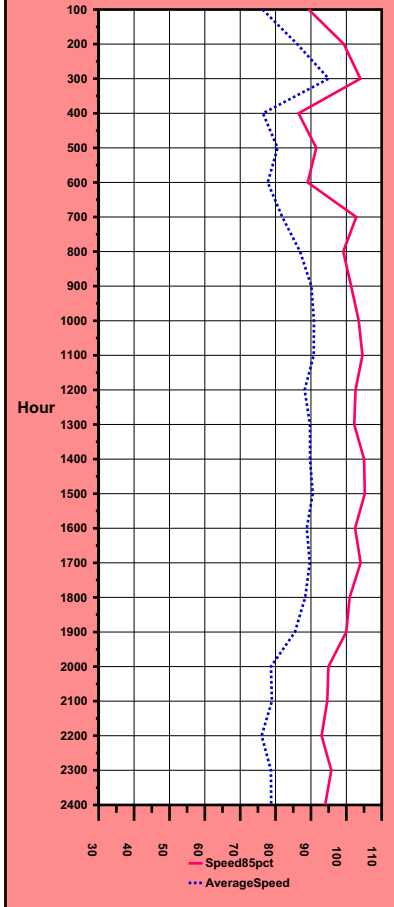
Hourly Speed Summary

Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly Mean Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day AADT	**278**
Seven Day AADT	**279**

Time	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	Total	Mean	85pct
Midnight - 1am	0	0	0	0	0	2	2	5	4	2	0	0	**15**	76.3	89.4
1am - 2am	0	0	0	0	0	1	1	1	0	5	1	0	**9**	86.1	99.3
2am - 3am	0	0	0	0	0	0	0	0	1	2	1	0	**4**	95.0	104.0
3am - 4am	0	0	0	0	0	1	0	3	3	0	0	0	**7**	76.4	86.5
4am - 5am	0	0	0	0	0	0	3	6	6	2	1	0	**18**	80.6	91.5
5am - 6am	0	0	0	0	0	3	9	10	16	4	1	0	**43**	77.8	89.1
6am - 7am	0	0	0	0	1	7	5	3	15	5	8	1	**45**	81.9	102.8
7am - 8am	0	0	0	0	1	1	9	15	52	30	14	2	**124**	86.9	99.1
8am - 9am	0	0	0	0	0	0	2	24	41	47	18	5	**137**	90.1	101.4
9am - 10am	0	0	0	0	0	0	1	15	31	29	16	4	**96**	90.8	103.5
10am - 11am	0	0	0	0	0	2	8	17	31	47	25	7	**137**	90.8	104.6
11am - Midday	0	0	0	0	0	2	11	21	43	35	17	8	**137**	88.2	102.6
Midday - 1pm	0	0	0	0	0	2	5	26	38	51	17	9	**148**	89.7	102.2
1pm - 2pm	0	0	0	0	2	0	3	30	37	38	18	12	**140**	89.7	105.0
2pm - 3pm	0	0	0	0	1	0	5	26	31	38	28	7	**136**	90.5	105.2
3pm - 4pm	0	0	0	0	0	3	8	32	43	51	20	10	**167**	88.8	102.5
4pm - 5pm	0	0	0	0	1	2	3	37	44	50	27	10	**174**	89.7	104.0
5pm - 6pm	0	0	0	0	0	3	4	27	49	41	19	5	**148**	88.4	100.9
6pm - 7pm	0	0	0	0	0	0	13	13	34	14	10	3	**87**	85.5	100.0
7pm - 8pm	0	0	0	0	0	2	15	17	11	7	5	0	**57**	78.7	94.9
8pm - 9pm	0	0	0	0	0	2	10	9	9	5	2	1	**38**	78.9	94.6
9pm - 10pm	0	0	0	0	0	3	7	8	4	6	0	0	**28**	76.1	93.0
10pm - 11pm	0	0	0	0	0	4	0	7	4	2	1	1	**19**	78.7	95.8
11pm - Midnigh	0	0	0	0	0	1	3	5	3	4	0	0	**16**	78.8	94.0
Total	0	0	0	0	6	41	127	357	550	515	249	85	**1930**		
% of Total						2	7	18	28	27	13	4			



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Hourly Classification Summary

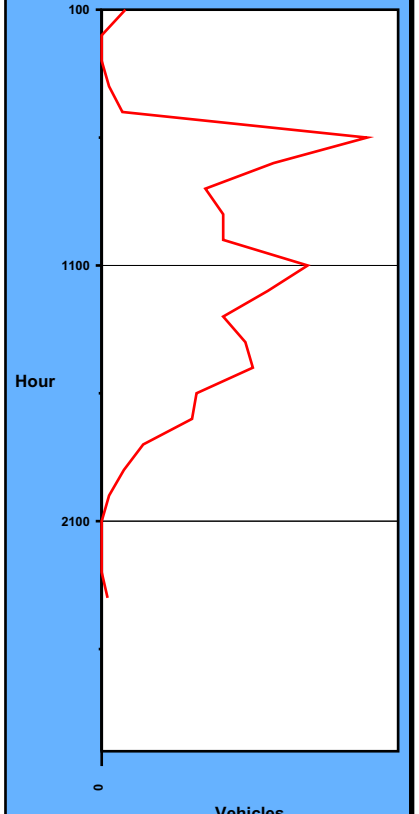
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327** **GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**		
Location	South of Brayton Road, On No Overtaking Sign		*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day AADT	**238**
Seven Day AADT	**182**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	16	0	0	0	0	0	0	0	0	0	0	0	0	**16**	**2**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3am - 4am	0	3	0	1	0	0	0	0	0	0	1	0	0	0	**5**	**1**
4am - 5am	0	5	0	1	0	0	0	0	0	4	4	0	0	0	**14**	**2**
5am - 6am	5	71	0	8	3	0	0	0	5	46	41	0	0	0	**179**	**26**
6am - 7am	5	10	0	6	10	2	0	0	3	33	47	0	0	0	**116**	**17**
7am - 8am	4	4	0	9	7	5	1	0	1	17	22	0	0	0	**70**	**10**
8am - 9am	2	17	0	3	10	4	0	0	1	23	22	0	0	0	**82**	**12**
9am - 10am	1	8	0	4	2	1	0	0	3	29	34	0	0	0	**82**	**12**
10am - 11am	4	16	0	9	6	7	0	0	1	41	55	0	0	0	**139**	**20**
11am - Midday	1	45	0	4	6	4	0	1	1	27	23	0	0	0	**112**	**16**
Midday - 1pm	0	25	0	2	0	4	0	0	3	23	25	0	0	0	**82**	**12**
1pm - 2pm	2	18	0	12	4	5	0	1	2	27	26	0	0	0	**97**	**14**
2pm - 3pm	3	10	0	6	12	0	0	1	2	22	46	0	0	0	**102**	**15**
3pm - 4pm	1	23	0	0	9	4	0	0	0	14	13	0	0	0	**64**	**9**
4pm - 5pm	0	42	0	6	0	0	0	0	0	5	8	0	0	0	**61**	**9**
5pm - 6pm	1	21	0	3	0	0	1	0	0	0	2	0	0	0	**28**	**4**
6pm - 7pm	0	15	0	0	0	0	0	0	0	0	0	0	0	0	**15**	**2**
7pm - 8pm	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**	**1**
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11pm - Midnigh	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**1**
Total	29	358	0	74	69	36	2	3	22	311	369	0	0	0	**1273**	**182**
% of Total	2	28		6	5	3			2	24	29					



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

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Hourly Classification Summary

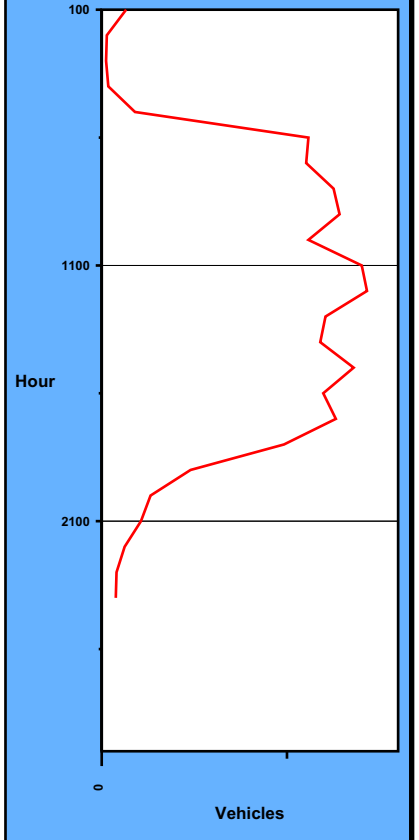
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on T *Carriageway*		

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day AADT	**720**
Seven Day AADT	**626**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	2	30	0	1	0	0	0	0	0	0	0	0	0	0	**33**	**5**
1am - 2am	0	6	0	1	0	0	0	0	0	0	0	0	0	0	**7**	**1**
2am - 3am	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**	**1**
3am - 4am	0	8	0	1	0	0	0	0	0	0	0	0	0	0	**9**	**1**
4am - 5am	6	21	0	2	0	0	0	0	0	9	7	0	0	0	**45**	**6**
5am - 6am	7	150	4	22	4	0	0	0	5	38	49	0	0	0	**279**	**40**
6am - 7am	8	80	1	7	12	16	0	1	11	57	83	0	0	0	**276**	**39**
7am - 8am	1	127	9	39	18	20	5	0	10	38	46	0	0	0	**313**	**45**
8am - 9am	6	180	8	21	16	8	1	2	6	36	36	1	0	0	**321**	**46**
9am - 10am	13	120	9	12	13	8	3	0	7	43	51	0	0	0	**279**	**40**
10am - 11am	8	149	12	17	21	13	2	0	3	53	73	0	0	0	**351**	**50**
11am - Midday	9	182	19	14	20	13	1	0	8	38	54	0	0	0	**358**	**51**
Midday - 1pm	12	168	9	14	12	9	0	0	5	39	34	0	0	0	**302**	**43**
1pm - 2pm	10	142	9	22	11	16	1	1	5	36	42	0	0	0	**295**	**42**
2pm - 3pm	3	163	10	23	23	7	2	0	10	42	57	0	0	0	**340**	**49**
3pm - 4pm	8	154	17	26	10	16	0	1	8	32	27	0	0	0	**299**	**43**
4pm - 5pm	13	221	6	28	3	0	1	1	3	22	18	0	0	0	**316**	**45**
5pm - 6pm	13	197	11	19	1	1	0	1	1	1	1	0	0	0	**246**	**35**
6pm - 7pm	6	100	3	6	3	0	0	0	0	0	2	0	0	0	**120**	**17**
7pm - 8pm	0	59	3	2	0	0	2	0	0	0	0	0	0	0	**66**	**9**
8pm - 9pm	0	47	1	5	0	0	0	0	0	0	0	0	0	0	**53**	**8**
9pm - 10pm	0	26	0	4	0	0	0	0	0	0	1	0	0	0	**31**	**4**
10pm - 11pm	0	19	0	0	0	0	0	1	0	0	0	0	0	0	**20**	**3**
11pm - Midnigh	0	15	0	3	1	0	0	0	0	0	0	0	0	0	**19**	**3**
Total	125	2370	131	289	168	127	18	8	82	484	581	1	0	0	**4384**	**626**
% of Total	3	54	3	7	4	3			2	11	13					



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Hourly Classification Summary

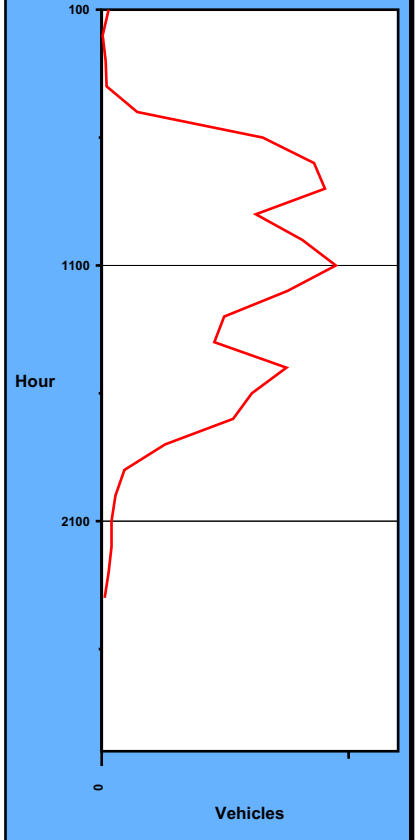
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177** **GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**		
Location	Just east of bend south near Brayton Road, on Guard Rail.		*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day AADT	**398**
Seven Day AADT	**326**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**	**1**
1am - 2am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**	
2am - 3am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**1**
3am - 4am	0	4	0	1	0	0	0	0	0	0	0	0	0	0	**5**	**1**
4am - 5am	0	15	0	1	0	0	0	0	0	10	10	0	0	0	**36**	**5**
5am - 6am	4	69	0	5	2	1	0	0	6	33	43	0	0	0	**163**	**23**
6am - 7am	0	53	0	3	5	12	0	1	8	56	77	0	0	0	**215**	**31**
7am - 8am	0	123	3	5	3	17	0	0	4	38	33	0	0	0	**226**	**32**
8am - 9am	1	76	2	8	2	6	0	0	2	21	38	0	0	0	**156**	**22**
9am - 10am	6	100	2	5	1	3	0	0	5	37	44	0	0	0	**203**	**29**
10am - 11am	5	106	0	7	4	9	0	0	2	41	63	0	0	0	**237**	**34**
11am - Midday	0	68	6	10	5	11	0	0	5	38	45	0	0	0	**188**	**27**
Midday - 1pm	1	42	4	8	2	6	0	0	4	27	30	0	0	0	**124**	**18**
1pm - 2pm	0	40	1	12	2	8	0	0	1	24	25	1	0	0	**114**	**16**
2pm - 3pm	3	67	4	15	3	4	0	0	4	36	51	0	0	0	**187**	**27**
3pm - 4pm	0	75	4	7	4	11	0	2	2	23	24	0	0	0	**152**	**22**
4pm - 5pm	0	89	3	12	0	1	1	0	2	13	12	0	0	0	**133**	**19**
5pm - 6pm	0	50	5	5	1	0	0	0	0	1	2	0	0	0	**64**	**9**
6pm - 7pm	0	14	0	3	1	1	0	1	0	0	3	0	0	0	**23**	**3**
7pm - 8pm	0	12	1	1	0	0	0	0	0	0	0	0	0	0	**14**	**2**
8pm - 9pm	0	9	0	1	0	0	0	0	0	0	0	0	0	0	**10**	**1**
9pm - 10pm	2	7	0	1	0	0	0	0	0	0	0	0	0	0	**10**	**1**
10pm - 11pm	0	6	1	0	0	0	0	0	0	0	0	0	0	0	**7**	**1**
11pm - Midnigh	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**	
Total	22	1039	36	111	35	90	1	4	45	398	500	1	0	0	**2282**	**326**
% of Total	1	46	2	5	2	4			2	17	22					



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Hourly Classification Summary

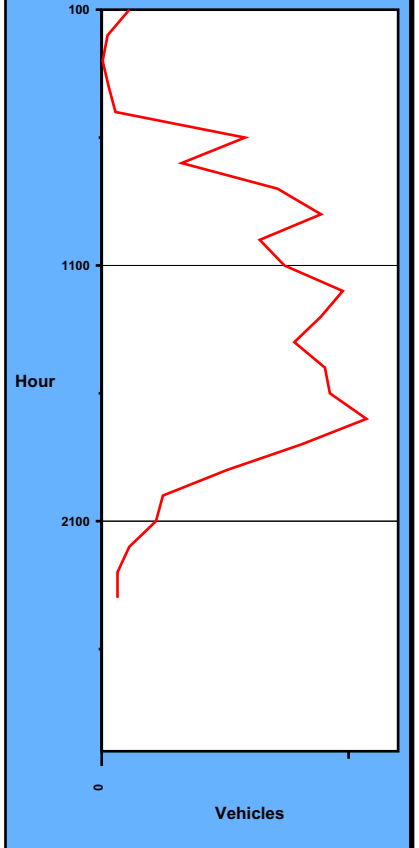
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day AADT	**448**
Seven Day AADT	**417**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	2	26	0	0	0	0	0	0	0	0	0	0	0	0	**28**	**4**
1am - 2am	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**	**1**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**	
3am - 4am	0	4	0	3	0	0	0	0	0	0	0	0	0	0	**7**	**1**
4am - 5am	0	14	0	0	0	0	0	0	0	0	0	0	0	0	**14**	**2**
5am - 6am	0	119	4	20	1	0	0	0	1	0	0	0	0	0	**145**	**21**
6am - 7am	1	58	1	5	6	3	0	1	0	2	4	0	0	0	**81**	**12**
7am - 8am	5	108	4	38	12	3	1	0	2	4	1	0	0	0	**178**	**25**
8am - 9am	8	156	8	31	3	0	1	1	5	3	6	0	0	0	**222**	**32**
9am - 10am	0	128	6	13	2	1	3	0	0	3	4	0	0	0	**160**	**23**
10am - 11am	2	131	12	21	4	3	1	0	0	6	5	0	0	0	**185**	**26**
11am - Midday	0	189	16	16	7	1	1	0	3	4	7	0	0	0	**244**	**35**
Midday - 1pm	2	173	10	16	5	3	1	0	1	5	6	0	0	0	**222**	**32**
1pm - 2pm	4	136	10	26	8	3	0	0	2	3	3	0	0	0	**195**	**28**
2pm - 3pm	2	153	12	34	8	3	0	0	5	6	3	0	0	0	**226**	**32**
3pm - 4pm	9	151	19	28	4	1	0	3	3	6	7	0	0	0	**231**	**33**
4pm - 5pm	6	207	7	32	5	0	0	1	1	5	4	0	0	0	**268**	**38**
5pm - 6pm	1	167	7	22	1	1	1	1	1	0	0	0	0	0	**202**	**29**
6pm - 7pm	0	107	4	10	1	1	0	1	0	0	3	0	0	0	**127**	**18**
7pm - 8pm	0	56	1	3	0	0	2	0	0	0	0	0	0	0	**62**	**9**
8pm - 9pm	0	46	1	6	2	0	0	0	0	0	0	0	0	0	**55**	**8**
9pm - 10pm	0	26	0	1	0	0	0	0	0	0	1	0	0	0	**28**	**4**
10pm - 11pm	0	14	0	2	0	0	0	0	0	0	0	0	0	0	**16**	**2**
11pm - Midnigh	0	14	0	2	0	0	0	0	0	0	0	0	0	0	**16**	**2**
Total	42	2189	122	330	69	23	11	8	24	47	54	0	0	0	**2919**	**417**
% of Total	1	75	4	11	2	1			1	2	2					



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Hourly Classification Summary

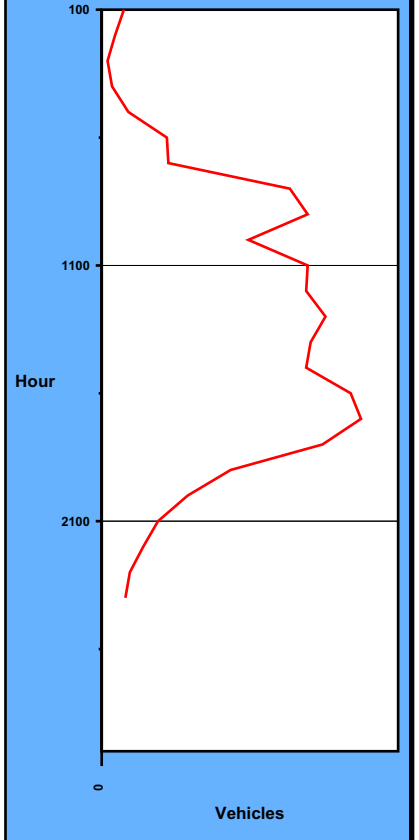
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	800 Meters, from Gunlake Mine access, on Tree.		*Carriageway*

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day AADT	**278**
Seven Day AADT	**279**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	15	0	0	0	0	0	0	0	0	0	0	0	0	**15**	**2**
1am - 2am	0	6	0	3	0	0	0	0	0	0	0	0	0	0	**9**	**1**
2am - 3am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**1**
3am - 4am	0	5	0	2	0	0	0	0	0	0	0	0	0	0	**7**	**1**
4am - 5am	0	18	0	0	0	0	0	0	0	0	0	0	0	0	**18**	**3**
5am - 6am	0	34	2	8	0	0	0	0	0	0	0	0	0	0	**44**	**6**
6am - 7am	0	39	1	2	1	0	1	0	1	0	0	0	0	0	**45**	**6**
7am - 8am	0	87	7	31	1	0	0	0	0	0	1	0	0	0	**127**	**18**
8am - 9am	0	107	9	21	1	0	0	0	0	1	0	0	0	0	**139**	**20**
9am - 10am	1	77	7	10	1	0	3	0	0	0	0	0	0	0	**99**	**14**
10am - 11am	0	109	13	14	1	0	0	0	0	2	0	0	0	0	**139**	**20**
11am - Midday	0	106	18	12	1	1	0	0	0	0	0	0	0	0	**138**	**20**
Midday - 1pm	1	119	10	18	1	0	0	0	2	0	0	0	0	0	**151**	**22**
1pm - 2pm	5	102	9	20	0	0	2	1	1	1	0	0	0	0	**141**	**20**
2pm - 3pm	0	111	9	13	2	1	1	0	1	0	0	0	0	0	**138**	**20**
3pm - 4pm	0	126	15	27	0	0	0	0	0	0	0	0	0	0	**168**	**24**
4pm - 5pm	0	145	6	24	0	0	0	0	0	0	0	0	0	0	**175**	**25**
5pm - 6pm	0	123	10	14	0	0	1	0	1	0	0	0	0	0	**149**	**21**
6pm - 7pm	0	78	2	7	0	0	0	0	0	0	0	0	0	0	**87**	**12**
7pm - 8pm	0	52	3	1	0	0	2	0	0	0	0	0	0	0	**58**	**8**
8pm - 9pm	0	32	1	5	0	0	0	0	0	0	0	0	0	0	**38**	**5**
9pm - 10pm	0	22	0	5	0	0	0	0	0	0	1	0	0	0	**28**	**4**
10pm - 11pm	0	13	0	5	0	0	1	0	0	0	0	0	0	0	**19**	**3**
11pm - Midnigh	0	13	0	3	0	0	0	0	0	0	0	0	0	0	**16**	**2**
Total	7	1543	122	245	9	2	11	1	6	4	2	0	0	0	**1952**	**279**
% of Total		79	6	13			1									



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

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Classification Data

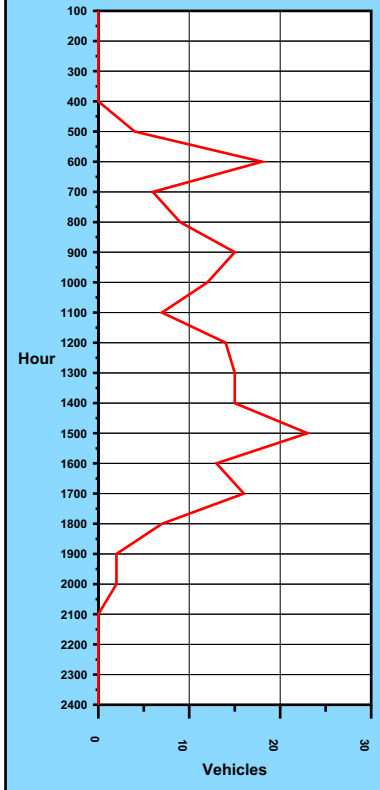
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

MON 17-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	3	0	0	0	0	0	0	0	0	1	0	0	0	**4**
5am - 6am	0	12	0	1	0	0	0	0	1	3	1	0	0	0	**18**
6am - 7am	0	1	0	0	0	0	0	0	0	3	2	0	0	0	**6**
7am - 8am	0	0	0	1	0	2	0	0	1	2	3	0	0	0	**9**
8am - 9am	1	3	0	1	0	2	0	0	1	3	4	0	0	0	**15**
9am - 10am	0	0	0	0	0	1	0	0	1	6	4	0	0	0	**12**
10am - 11am	0	0	0	2	0	3	0	0	0	1	1	0	0	0	**7**
11am - Midday	0	4	0	1	0	2	0	0	1	2	4	0	0	0	**14**
Midday - 1pm	0	7	0	1	0	2	0	0	0	3	2	0	0	0	**15**
1pm - 2pm	1	0	0	2	2	0	0	0	1	4	5	0	0	0	**15**
2pm - 3pm	1	1	0	0	3	0	0	0	1	4	13	0	0	0	**23**
3pm - 4pm	0	5	0	0	1	0	0	0	0	3	4	0	0	0	**13**
4pm - 5pm	0	12	0	1	0	0	0	0	0	2	1	0	0	0	**16**
5pm - 6pm	1	5	0	0	0	0	1	0	0	0	0	0	0	0	**7**
6pm - 7pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7pm - 8pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	4	57	0	10	6	12	1	0	7	36	45	0	0	0	**178**
% of Total	2	32		6	3	7	1		4	20	25				



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

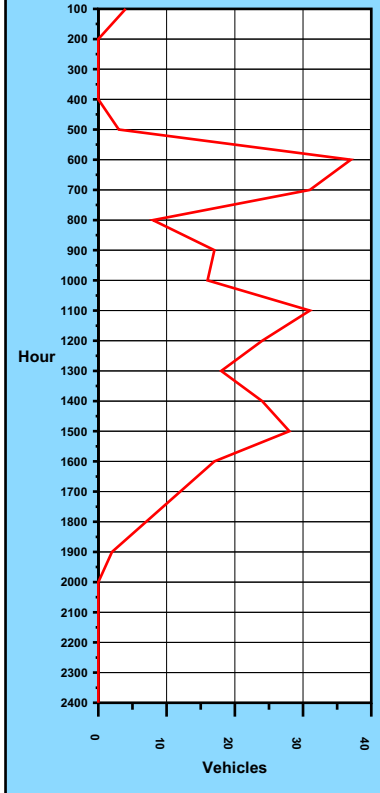
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

TUE 18-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	1	1	0	0	0	**3**
5am - 6am	3	12	0	0	1	0	0	0	1	12	8	0	0	0	**37**
6am - 7am	1	1	0	3	5	0	0	0	1	5	15	0	0	0	**31**
7am - 8am	0	0	0	0	0	0	0	0	0	3	5	0	0	0	**8**
8am - 9am	0	4	0	1	1	0	0	0	0	4	7	0	0	0	**17**
9am - 10am	0	0	0	1	2	0	0	0	0	7	6	0	0	0	**16**
10am - 11am	0	4	0	2	1	1	0	0	0	5	18	0	0	0	**31**
11am - Midday	0	7	0	2	0	0	0	0	0	10	5	0	0	0	**24**
Midday - 1pm	0	4	0	1	0	0	0	0	1	4	8	0	0	0	**18**
1pm - 2pm	0	1	0	6	1	4	0	0	0	4	8	0	0	0	**24**
2pm - 3pm	1	0	0	1	5	0	0	1	1	5	14	0	0	0	**28**
3pm - 4pm	1	4	0	0	1	4	0	0	0	3	4	0	0	0	**17**
4pm - 5pm	0	8	0	0	0	0	0	0	0	0	4	0	0	0	**12**
5pm - 6pm	0	5	0	1	0	0	0	0	0	0	1	0	0	0	**7**
6pm - 7pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	6	57	0	18	17	9	0	1	4	63	104	0	0	0	**279**
% of Total	2	20		6	6	3			1	23	37				



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

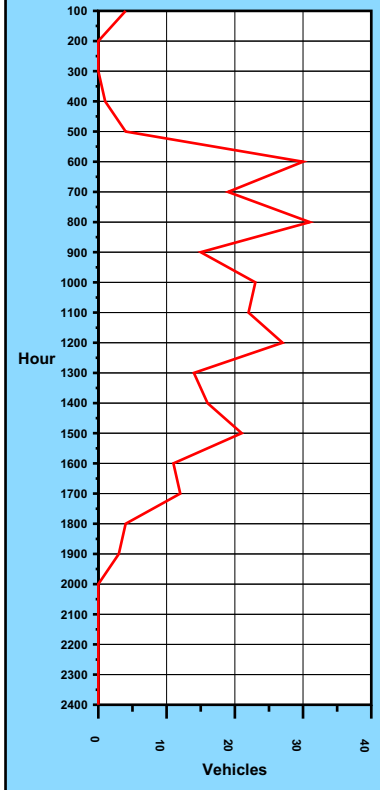
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

WED 19-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	1	0	1	0	0	0	0	0	1	1	0	0	0	**4**
5am - 6am	1	11	0	1	1	0	0	0	1	7	8	0	0	0	**30**
6am - 7am	1	1	0	1	0	1	0	0	0	6	9	0	0	0	**19**
7am - 8am	2	3	0	4	2	3	1	0	0	8	8	0	0	0	**31**
8am - 9am	1	2	0	0	2	0	0	0	0	2	8	0	0	0	**15**
9am - 10am	1	3	0	1	0	0	0	0	0	10	8	0	0	0	**23**
10am - 11am	1	2	0	1	2	2	0	0	1	5	8	0	0	0	**22**
11am - Midday	1	12	0	0	2	0	0	0	0	6	6	0	0	0	**27**
Midday - 1pm	0	2	0	0	0	2	0	0	0	3	7	0	0	0	**14**
1pm - 2pm	0	5	0	1	0	0	0	1	0	6	3	0	0	0	**16**
2pm - 3pm	0	2	0	4	2	0	0	0	0	6	7	0	0	0	**21**
3pm - 4pm	0	2	0	0	4	0	0	0	0	2	3	0	0	0	**11**
4pm - 5pm	0	11	0	1	0	0	0	0	0	0	0	0	0	0	**12**
5pm - 6pm	0	2	0	1	0	0	0	0	0	0	1	0	0	0	**4**
6pm - 7pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	8	67	0	16	15	8	1	1	2	62	77	0	0	0	**257**
% of Total	3	26		6	6	3			1	24	30				



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

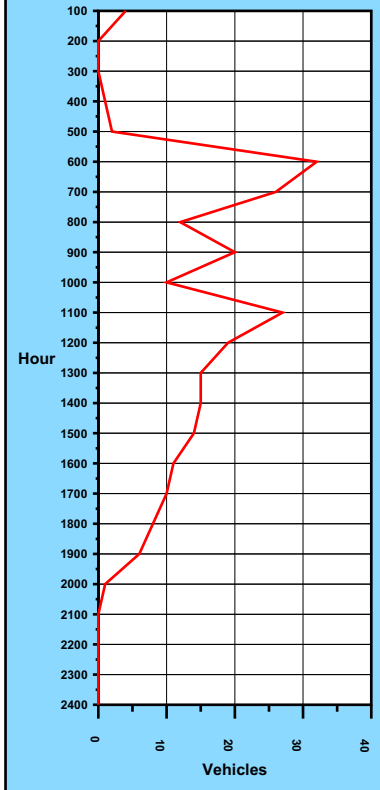
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

THU 20-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	0	0	0	0	0	0	0	0	1	1	0	0	0	**2**
5am - 6am	0	13	0	3	1	0	0	0	0	6	9	0	0	0	**32**
6am - 7am	1	5	0	0	2	1	0	0	1	11	5	0	0	0	**26**
7am - 8am	2	0	0	2	1	0	0	0	0	3	4	0	0	0	**12**
8am - 9am	0	5	0	1	5	2	0	0	0	6	1	0	0	0	**20**
9am - 10am	0	2	0	1	0	0	0	0	0	2	5	0	0	0	**10**
10am - 11am	2	4	0	1	2	1	0	0	0	11	6	0	0	0	**27**
11am - Midday	0	7	0	1	3	1	0	0	0	4	3	0	0	0	**19**
Midday - 1pm	0	4	0	0	0	0	0	0	1	6	4	0	0	0	**15**
1pm - 2pm	1	2	0	0	1	1	0	0	0	6	4	0	0	0	**15**
2pm - 3pm	1	3	0	1	1	0	0	0	0	3	5	0	0	0	**14**
3pm - 4pm	0	5	0	0	0	0	0	0	0	4	2	0	0	0	**11**
4pm - 5pm	0	6	0	1	0	0	0	0	0	1	2	0	0	0	**10**
5pm - 6pm	0	7	0	1	0	0	0	0	0	0	0	0	0	0	**8**
6pm - 7pm	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**
7pm - 8pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	7	75	0	12	16	6	0	0	2	64	51	0	0	0	**233**
% of Total	3	32		5	7	3			1	27	22				



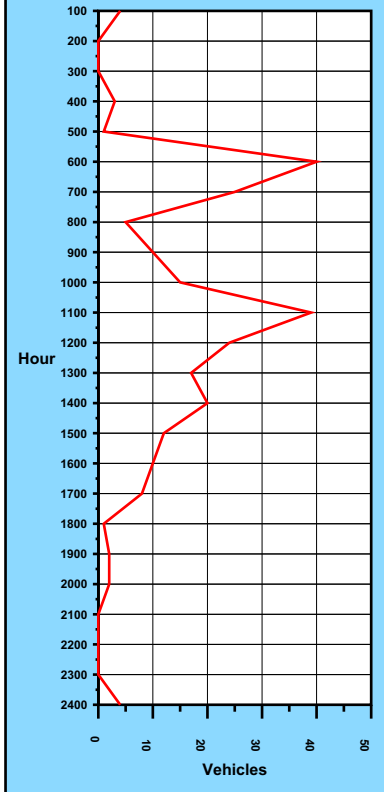
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

FRI 21-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	1	0	0	0	0	0	0	1	0	0	0	**3**
4am - 5am	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
5am - 6am	1	12	0	1	0	0	0	0	2	16	8	0	0	0	**40**
6am - 7am	2	2	0	0	1	0	0	0	1	8	11	0	0	0	**25**
7am - 8am	0	1	0	1	0	0	0	0	0	1	2	0	0	0	**5**
8am - 9am	0	2	0	0	0	0	0	0	0	6	2	0	0	0	**10**
9am - 10am	0	1	0	1	0	0	0	0	2	4	7	0	0	0	**15**
10am - 11am	0	4	0	1	1	0	0	0	0	16	17	0	0	0	**39**
11am - Midday	0	11	0	0	1	1	0	1	0	5	5	0	0	0	**24**
Midday - 1pm	0	5	0	0	0	0	0	0	1	7	4	0	0	0	**17**
1pm - 2pm	0	3	0	3	0	0	0	0	1	7	6	0	0	0	**20**
2pm - 3pm	0	1	0	0	1	0	0	0	0	4	6	0	0	0	**12**
3pm - 4pm	0	5	0	0	3	0	0	0	0	2	0	0	0	0	**10**
4pm - 5pm	0	4	0	1	0	0	0	0	0	2	1	0	0	0	**8**
5pm - 6pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
6pm - 7pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7pm - 8pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
Total	3	65	0	9	7	1	0	1	7	79	70	0	0	0	**242**
% of Total	1	27		4	3				3	33	29				



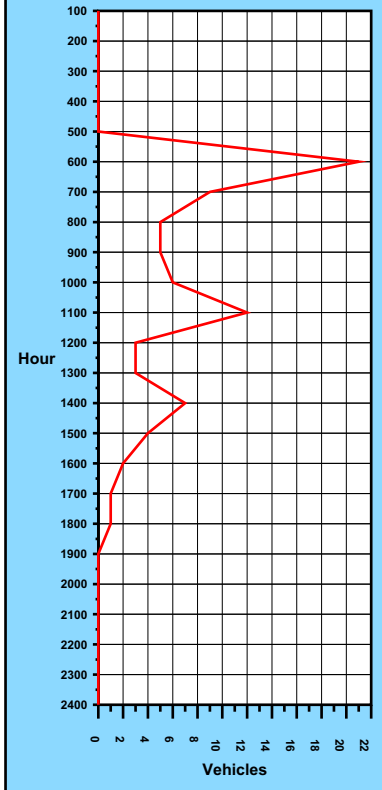
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327**	**GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**			
Location	South of Brayton Road, On No Overtaking Sign			*Carriageway*

SAT 22-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5am - 6am	0	11	0	1	0	0	0	0	0	2	7	0	0	0	**21**
6am - 7am	0	0	0	2	2	0	0	0	0	0	5	0	0	0	**9**
7am - 8am	0	0	0	1	4	0	0	0	0	0	0	0	0	0	**5**
8am - 9am	0	1	0	0	2	0	0	0	0	2	0	0	0	0	**5**
9am - 10am	0	2	0	0	0	0	0	0	0	0	4	0	0	0	**6**
10am - 11am	1	2	0	1	0	0	0	0	0	3	5	0	0	0	**12**
11am - Midday	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Midday - 1pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
1pm - 2pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
2pm - 3pm	0	3	0	0	0	0	0	0	0	0	1	0	0	0	**4**
3pm - 4pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
4pm - 5pm	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
5pm - 6pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
6pm - 7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	35	0	6	8	0	0	0	0	7	22	0	0	0	**79**
% of Total	1	44		8	10					9	28				



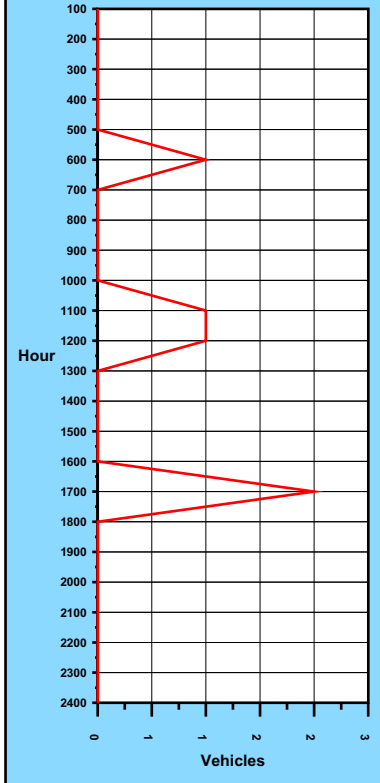
Count Number	**2529**	Ref : **EMM**	**Lat/Long : S34 39.937 / E149 58.327** **GOOGLE MAP**
Street	**GUNLAKE QUARRY ACCESS ROAD, MARULAN : Between GUNLAKE QUARRY & BRAYTON ROAD (bidirectional) :**		
Location	South of Brayton Road, On No Overtaking Sign		*Carriageway*

SUN 23-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**46**
Weekly 85th Percentile Speed	**66**
Five Day ADT	**238**
Seven Day ADT	**182**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5am - 6am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
6am - 7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7am - 8am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8am - 9am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9am - 10am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10am - 11am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
11am - Midday	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Midday - 1pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1pm - 2pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2pm - 3pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3pm - 4pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4pm - 5pm	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
5pm - 6pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6pm - 7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	2	0	3	0	0	0	0	0	0	0	0	0	0	**5**
% of Total		40		60											



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

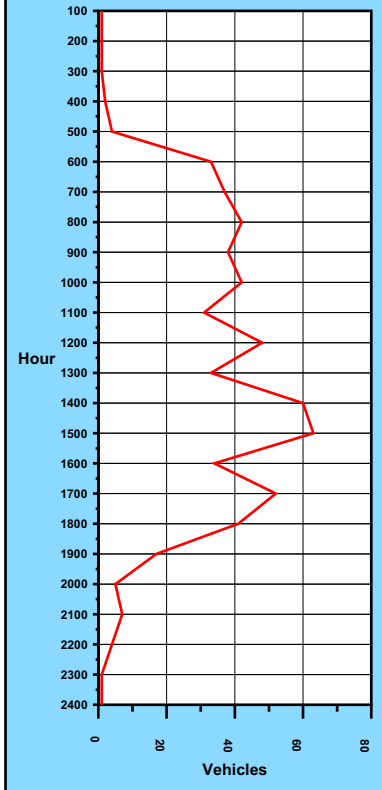
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*			

MON 17-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	3	0	0	0	0	0	0	0	0	1	0	0	0	**4**
5am - 6am	0	23	1	3	1	0	0	0	1	3	1	0	0	0	**33**
6am - 7am	2	11	0	1	0	4	0	0	5	8	6	0	0	0	**37**
7am - 8am	0	18	1	5	1	4	0	0	3	5	5	0	0	0	**42**
8am - 9am	1	21	1	2	1	2	0	0	1	4	5	0	0	0	**38**
9am - 10am	3	23	0	2	0	1	0	0	1	6	6	0	0	0	**42**
10am - 11am	1	15	1	2	3	5	0	0	0	2	2	0	0	0	**31**
11am - Midday	6	26	2	3	0	3	0	0	1	1	6	0	0	0	**48**
Midday - 1pm	0	24	0	1	1	2	0	0	0	3	2	0	0	0	**33**
1pm - 2pm	0	29	1	3	0	3	0	1	1	8	14	0	0	0	**60**
2pm - 3pm	0	24	1	8	3	2	0	0	1	5	19	0	0	0	**63**
3pm - 4pm	3	15	1	3	0	3	0	0	1	2	6	0	0	0	**34**
4pm - 5pm	3	27	0	6	0	0	0	1	2	7	6	0	0	0	**52**
5pm - 6pm	5	29	2	4	0	0	0	0	0	1	0	0	0	0	**41**
6pm - 7pm	0	15	0	2	0	0	0	0	0	0	0	0	0	0	**17**
7pm - 8pm	0	4	0	1	0	0	0	0	0	0	0	0	0	0	**5**
8pm - 9pm	0	6	0	1	0	0	0	0	0	0	0	0	0	0	**7**
9pm - 10pm	0	2	0	1	0	0	0	0	0	0	1	0	0	0	**4**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Total	24	320	11	50	10	29	0	2	17	55	80	0	0	0	**598**
% of Total	4	54	2	8	2	5			3	9	13				



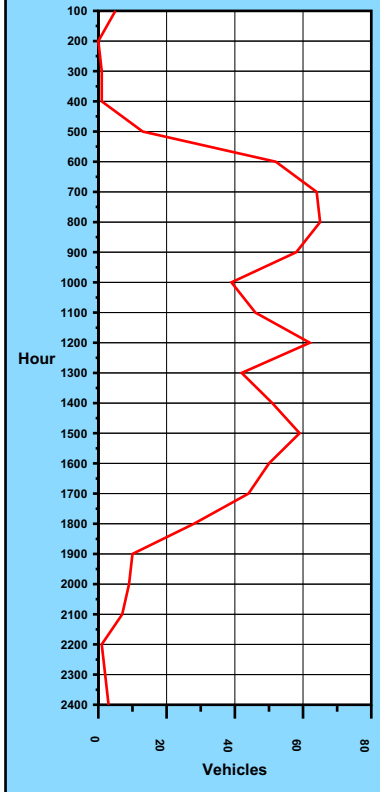
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*		

TUE 18-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	2	3	0	0	0	0	0	0	0	0	0	0	0	0	**5**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	4	0	2	0	0	0	0	0	3	4	0	0	0	**13**
5am - 6am	1	27	1	4	0	0	0	0	0	10	9	0	0	0	**52**
6am - 7am	4	14	0	1	1	3	0	1	2	15	23	0	0	0	**64**
7am - 8am	0	29	4	8	4	3	1	0	2	5	9	0	0	0	**65**
8am - 9am	2	34	0	3	2	4	0	1	0	3	9	0	0	0	**58**
9am - 10am	0	13	2	1	4	0	0	0	0	9	10	0	0	0	**39**
10am - 11am	0	15	0	0	1	0	1	0	1	9	19	0	0	0	**46**
11am - Midday	1	25	1	1	6	0	1	0	2	13	12	0	0	0	**62**
Midday - 1pm	0	19	2	1	3	2	0	0	0	7	8	0	0	0	**42**
1pm - 2pm	0	12	2	6	1	10	0	0	0	8	12	0	0	0	**51**
2pm - 3pm	0	26	1	3	4	0	0	0	1	7	17	0	0	0	**59**
3pm - 4pm	0	18	1	6	0	6	0	0	1	8	10	0	0	0	**50**
4pm - 5pm	0	32	0	2	1	0	0	0	0	1	8	0	0	0	**44**
5pm - 6pm	0	24	1	2	0	0	0	0	0	0	1	0	0	0	**28**
6pm - 7pm	0	8	0	0	0	0	0	0	0	0	2	0	0	0	**10**
7pm - 8pm	0	7	2	0	0	0	0	0	0	0	0	0	0	0	**9**
8pm - 9pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
9pm - 10pm	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	1	0	0	0	0	0	0	**2**
11pm - Midnight	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Total	10	323	17	41	27	28	3	3	9	98	153	0	0	0	**712**
% of Total	1	45	2	6	4	4			1	14	21				



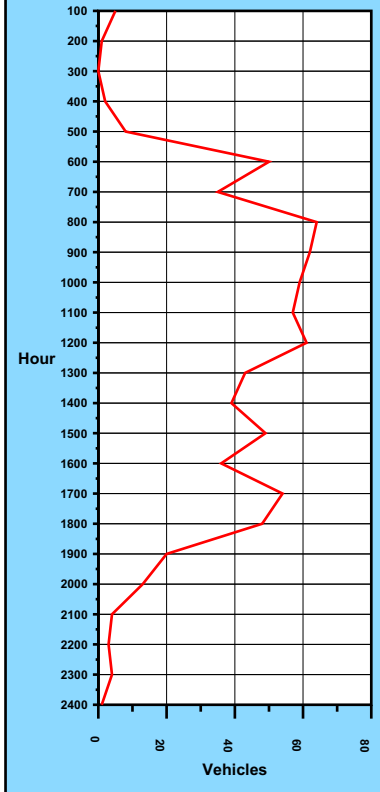
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*		

WED 19-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
1am - 2am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	5	0	0	0	0	0	0	0	2	1	0	0	0	**8**
5am - 6am	6	23	0	4	0	0	0	0	2	5	10	0	0	0	**50**
6am - 7am	0	9	0	2	0	2	0	0	0	7	15	0	0	0	**35**
7am - 8am	0	19	1	6	3	9	1	0	0	10	15	0	0	0	**64**
8am - 9am	1	28	2	5	3	0	0	1	2	8	12	0	0	0	**62**
9am - 10am	1	22	0	1	5	3	0	0	1	13	13	0	0	0	**59**
10am - 11am	0	25	0	4	7	2	0	0	1	4	14	0	0	0	**57**
11am - Midday	0	29	2	4	5	3	0	0	2	7	9	0	0	0	**61**
Midday - 1pm	0	19	1	3	1	2	0	0	1	5	11	0	0	0	**43**
1pm - 2pm	2	20	1	2	3	0	0	0	1	5	5	0	0	0	**39**
2pm - 3pm	0	20	0	6	4	0	0	0	0	14	5	0	0	0	**49**
3pm - 4pm	0	15	2	5	2	2	0	0	2	5	3	0	0	0	**36**
4pm - 5pm	0	43	0	3	2	0	0	0	0	5	1	0	0	0	**54**
5pm - 6pm	1	42	1	3	0	1	0	0	0	0	0	0	0	0	**48**
6pm - 7pm	2	17	0	0	1	0	0	0	0	0	0	0	0	0	**20**
7pm - 8pm	0	12	0	1	0	0	0	0	0	0	0	0	0	0	**13**
8pm - 9pm	0	2	0	2	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
10pm - 11pm	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	13	365	10	52	36	24	1	1	12	90	114	0	0	0	**718**
% of Total	2	51	1	7	5	3			2	13	16				



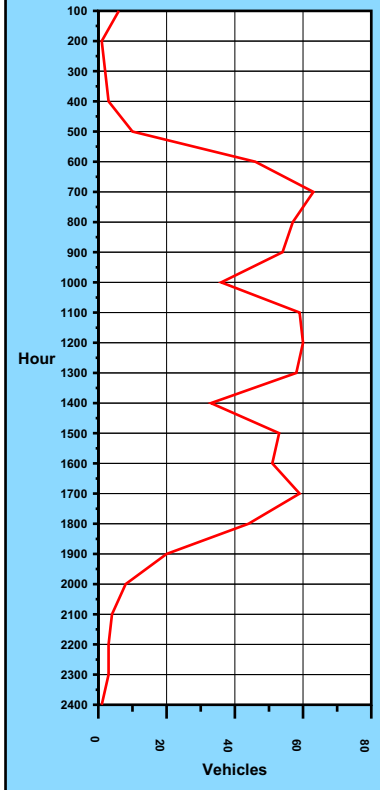
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*		

THU 20-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
3am - 4am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
4am - 5am	6	3	0	0	0	0	0	0	0	1	0	0	0	0	**10**
5am - 6am	0	26	0	4	0	0	0	0	0	7	9	0	0	0	**46**
6am - 7am	0	19	0	2	5	7	0	0	2	14	14	0	0	0	**63**
7am - 8am	0	19	1	9	5	0	2	0	2	7	12	0	0	0	**57**
8am - 9am	1	26	2	4	4	2	0	0	1	9	4	1	0	0	**54**
9am - 10am	3	12	1	3	2	4	0	0	0	4	7	0	0	0	**36**
10am - 11am	4	22	2	4	1	6	0	0	0	12	8	0	0	0	**59**
11am - Midday	2	24	1	0	6	4	0	0	2	8	13	0	0	0	**60**
Midday - 1pm	3	24	1	6	2	1	0	0	1	14	6	0	0	0	**58**
1pm - 2pm	0	16	0	3	3	1	0	0	0	4	6	0	0	0	**33**
2pm - 3pm	2	12	2	5	8	5	0	0	3	7	9	0	0	0	**53**
3pm - 4pm	2	24	2	4	0	3	0	0	0	11	5	0	0	0	**51**
4pm - 5pm	2	41	2	7	0	0	0	0	0	5	2	0	0	0	**59**
5pm - 6pm	4	35	2	2	0	0	0	0	1	0	0	0	0	0	**44**
6pm - 7pm	1	18	0	1	0	0	0	0	0	0	0	0	0	0	**20**
7pm - 8pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
8pm - 9pm	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	30	352	16	54	36	33	2	0	12	103	95	1	0	0	**734**
% of Total	4	48	2	7	5	4			2	14	13				



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

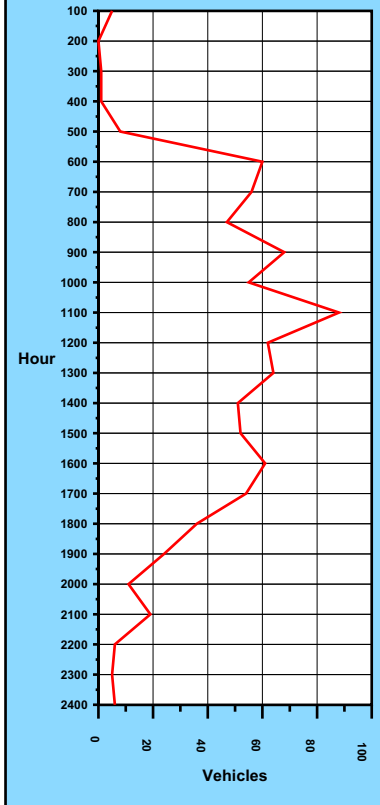
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*			

FRI 21-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	4	0	0	0	0	0	0	0	3	1	0	0	0	**8**
5am - 6am	0	23	2	4	3	0	0	0	2	13	13	0	0	0	**60**
6am - 7am	2	19	1	0	3	0	0	0	1	12	18	0	0	0	**56**
7am - 8am	1	26	1	9	1	2	1	0	1	3	2	0	0	0	**47**
8am - 9am	1	45	0	5	3	0	1	0	1	7	5	0	0	0	**68**
9am - 10am	1	20	2	4	0	0	1	0	5	11	11	0	0	0	**55**
10am - 11am	3	25	3	6	8	0	1	0	1	21	20	0	0	0	**88**
11am - Midday	0	33	4	2	2	1	0	0	1	8	11	0	0	0	**62**
Midday - 1pm	1	32	3	3	5	2	0	0	1	10	7	0	0	0	**64**
1pm - 2pm	3	16	1	5	4	2	1	0	3	11	5	0	0	0	**51**
2pm - 3pm	0	27	1	0	4	0	0	0	5	9	6	0	0	0	**52**
3pm - 4pm	2	29	1	6	7	2	0	1	4	6	3	0	0	0	**61**
4pm - 5pm	5	36	1	5	0	0	1	0	1	4	1	0	0	0	**54**
5pm - 6pm	2	30	2	2	0	0	0	0	0	0	0	0	0	0	**36**
6pm - 7pm	1	19	2	1	1	0	0	0	0	0	0	0	0	0	**24**
7pm - 8pm	0	11	0	0	0	0	0	0	0	0	0	0	0	0	**11**
8pm - 9pm	0	16	1	2	0	0	0	0	0	0	0	0	0	0	**19**
9pm - 10pm	0	4	0	2	0	0	0	0	0	0	0	0	0	0	**6**
10pm - 11pm	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
11pm - Midnight	0	5	0	0	1	0	0	0	0	0	0	0	0	0	**6**
Total	22	432	25	56	42	9	6	1	26	118	103	0	0	0	**840**
% of Total	3	51	3	7	5	1	1		3	14	12				



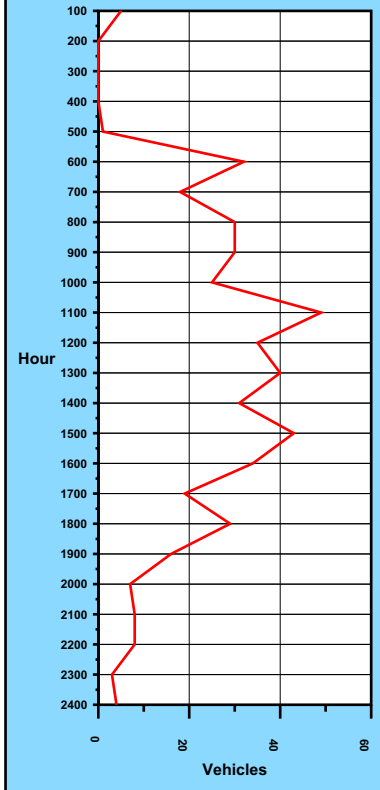
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*			

SAT 22-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	23	0	2	0	0	0	0	0	0	7	0	0	0	**32**
6am - 7am	0	5	0	1	3	0	0	0	1	1	7	0	0	0	**18**
7am - 8am	0	9	0	2	4	2	0	0	2	8	3	0	0	0	**30**
8am - 9am	0	17	2	1	3	0	0	0	1	5	1	0	0	0	**30**
9am - 10am	3	14	2	1	1	0	0	0	0	0	4	0	0	0	**25**
10am - 11am	0	29	3	1	1	0	0	0	0	5	10	0	0	0	**49**
11am - Midday	0	23	4	2	0	2	0	0	0	1	3	0	0	0	**35**
Midday - 1pm	5	34	1	0	0	0	0	0	0	0	0	0	0	0	**40**
1pm - 2pm	3	23	3	2	0	0	0	0	0	0	0	0	0	0	**31**
2pm - 3pm	1	36	4	0	0	0	1	0	0	0	1	0	0	0	**43**
3pm - 4pm	1	25	7	1	0	0	0	0	0	0	0	0	0	0	**34**
4pm - 5pm	0	17	1	1	0	0	0	0	0	0	0	0	0	0	**19**
5pm - 6pm	1	22	2	3	1	0	0	0	0	0	0	0	0	0	**29**
6pm - 7pm	0	14	0	1	1	0	0	0	0	0	0	0	0	0	**16**
7pm - 8pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
8pm - 9pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
9pm - 10pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
Total	14	327	29	18	14	4	1	0	4	20	36	0	0	0	**467**
% of Total	3	70	6	4	3	1			1	4	8				



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

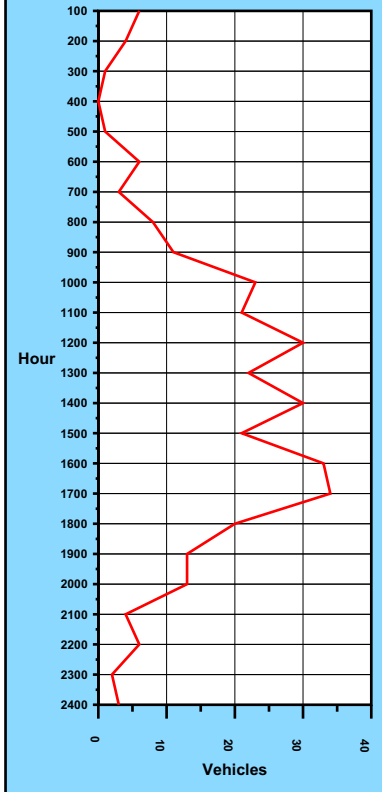
Count Number	**2530**	Ref : **EMM**	**Lat/Long : S34 41.235 / E149 59.576**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	East of Joaramin Road and between Joaramin Road and Jonniefield Quarry Access Road, opposite House No. 355, on *Carriageway*			

SUN 23-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**74**
Weekly 85th Percentile Speed	**91**
Five Day ADT	**720**
Seven Day ADT	**626**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**
1am - 2am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**
6am - 7am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7am - 8am	0	7	1	0	0	0	0	0	0	0	0	0	0	0	**8**
8am - 9am	0	9	1	1	0	0	0	0	0	0	0	0	0	0	**11**
9am - 10am	2	16	2	0	1	0	2	0	0	0	0	0	0	0	**23**
10am - 11am	0	18	3	0	0	0	0	0	0	0	0	0	0	0	**21**
11am - Midday	0	22	5	2	1	0	0	0	0	0	0	0	0	0	**30**
Midday - 1pm	3	16	1	0	0	0	0	0	2	0	0	0	0	0	**22**
1pm - 2pm	2	26	1	1	0	0	0	0	0	0	0	0	0	0	**30**
2pm - 3pm	0	18	1	1	0	0	1	0	0	0	0	0	0	0	**21**
3pm - 4pm	0	28	3	1	1	0	0	0	0	0	0	0	0	0	**33**
4pm - 5pm	3	25	2	4	0	0	0	0	0	0	0	0	0	0	**34**
5pm - 6pm	0	15	1	3	0	0	0	1	0	0	0	0	0	0	**20**
6pm - 7pm	2	9	1	1	0	0	0	0	0	0	0	0	0	0	**13**
7pm - 8pm	0	10	1	0	0	0	2	0	0	0	0	0	0	0	**13**
8pm - 9pm	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**
10pm - 11pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
11pm - Midnight	0	1	0	2	0	0	0	0	0	0	0	0	0	0	**3**
Total	12	251	23	18	3	0	5	1	2	0	0	0	0	0	**315**
% of Total	4	80	7	6	1		2		1						



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

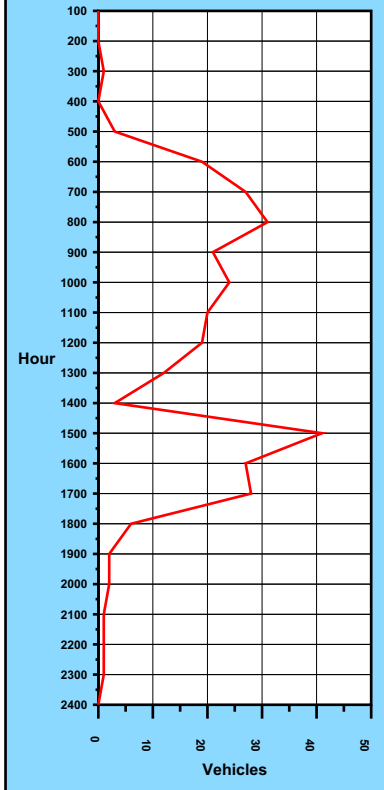
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

MON 17-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	1	0	0	0	0	0	0	1	0	0	0	**3**
5am - 6am	0	10	0	1	0	1	0	0	3	3	1	0	0	0	**19**
6am - 7am	0	7	0	0	0	3	0	0	3	9	5	0	0	0	**27**
7am - 8am	0	16	1	1	0	2	0	0	0	6	5	0	0	0	**31**
8am - 9am	0	11	0	2	0	1	0	0	0	1	6	0	0	0	**21**
9am - 10am	2	9	0	2	0	0	0	0	1	5	5	0	0	0	**24**
10am - 11am	0	12	0	0	1	3	0	0	0	1	3	0	0	0	**20**
11am - Midday	0	6	2	0	1	4	0	0	1	1	4	0	0	0	**19**
Midday - 1pm	0	7	0	0	0	2	0	0	0	2	1	0	0	0	**12**
1pm - 2pm	0	0	0	0	0	0	0	0	0	0	3	0	0	0	**3**
2pm - 3pm	0	15	0	4	1	2	0	0	0	6	13	0	0	0	**41**
3pm - 4pm	0	12	1	1	0	3	0	1	0	3	6	0	0	0	**27**
4pm - 5pm	0	17	0	1	0	0	0	0	2	5	3	0	0	0	**28**
5pm - 6pm	0	3	1	0	0	0	0	0	0	1	1	0	0	0	**6**
6pm - 7pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7pm - 8pm	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
8pm - 9pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	2	133	5	14	3	21	0	1	10	43	57	0	0	0	**289**
% of Total	1	46	2	5	1	7			3	15	20				



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

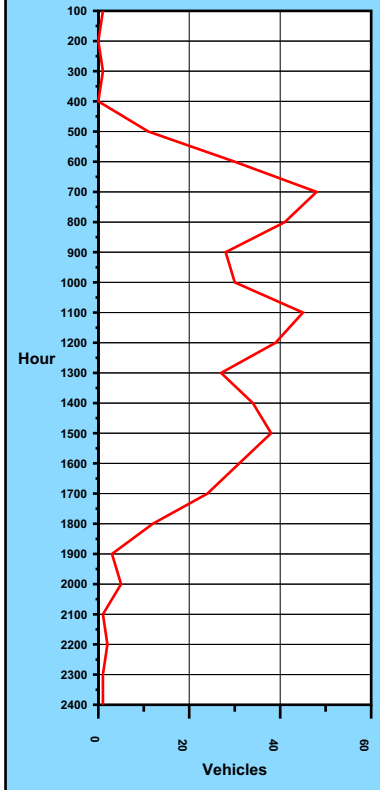
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

TUE 18-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	3	0	0	0	0	0	0	0	4	4	0	0	0	**11**
5am - 6am	0	12	0	1	0	0	0	0	1	7	9	0	0	0	**30**
6am - 7am	0	5	0	0	1	2	0	1	1	16	22	0	0	0	**48**
7am - 8am	0	23	2	0	1	3	0	0	1	5	6	0	0	0	**41**
8am - 9am	1	11	0	0	0	3	0	0	0	2	11	0	0	0	**28**
9am - 10am	0	13	0	0	0	0	0	0	0	9	8	0	0	0	**30**
10am - 11am	0	21	0	0	0	0	0	0	0	8	16	0	0	0	**45**
11am - Midday	0	15	2	0	0	0	0	0	1	12	9	0	0	0	**39**
Midday - 1pm	1	7	1	3	1	1	0	0	0	5	8	0	0	0	**27**
1pm - 2pm	0	8	0	2	0	8	0	0	0	6	10	0	0	0	**34**
2pm - 3pm	0	13	0	0	0	0	0	0	1	6	18	0	0	0	**38**
3pm - 4pm	0	13	0	1	1	4	0	0	0	4	8	0	0	0	**31**
4pm - 5pm	0	18	0	1	0	0	0	0	0	1	4	0	0	0	**24**
5pm - 6pm	0	10	1	0	0	0	0	0	0	0	1	0	0	0	**12**
6pm - 7pm	0	0	0	1	1	0	0	0	0	0	1	0	0	0	**3**
7pm - 8pm	0	4	1	0	0	0	0	0	0	0	0	0	0	0	**5**
8pm - 9pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
9pm - 10pm	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
10pm - 11pm	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	2	181	8	10	5	21	0	1	5	85	135	0	0	0	**453**
% of Total		40	2	2	1	5			1	19	30				



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

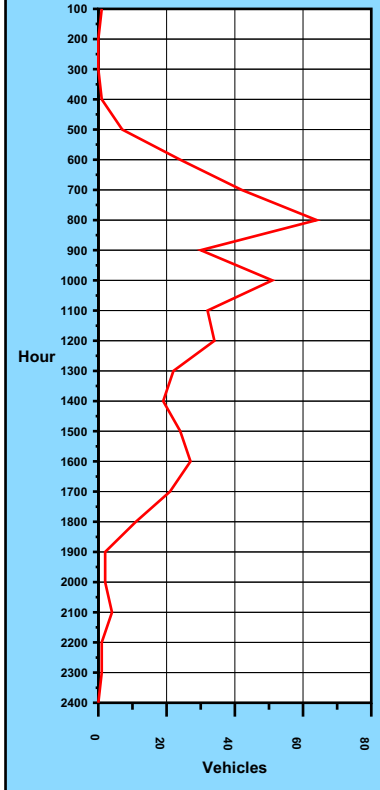
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

WED 19-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	4	0	0	0	0	0	0	0	2	1	0	0	0	**7**
5am - 6am	0	9	0	0	0	0	0	0	1	4	10	0	0	0	**24**
6am - 7am	0	22	0	1	0	1	0	0	0	7	11	0	0	0	**42**
7am - 8am	0	40	0	0	0	7	0	0	0	9	8	0	0	0	**64**
8am - 9am	0	12	1	3	0	0	0	0	1	5	8	0	0	0	**30**
9am - 10am	0	28	0	1	0	2	0	0	0	9	11	0	0	0	**51**
10am - 11am	0	13	0	0	2	1	0	0	1	4	11	0	0	0	**32**
11am - Midday	0	10	1	3	2	2	0	0	1	8	7	0	0	0	**34**
Midday - 1pm	0	7	0	1	1	1	0	0	1	4	7	0	0	0	**22**
1pm - 2pm	0	6	1	3	1	0	0	0	0	5	3	0	0	0	**19**
2pm - 3pm	1	0	2	2	1	1	0	0	0	10	7	0	0	0	**24**
3pm - 4pm	0	13	0	2	1	2	0	0	1	5	3	0	0	0	**27**
4pm - 5pm	0	16	0	3	0	0	0	0	0	2	0	0	0	0	**21**
5pm - 6pm	0	10	1	0	0	0	0	0	0	0	0	0	0	0	**11**
6pm - 7pm	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**2**
7pm - 8pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8pm - 9pm	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	200	6	19	8	17	0	1	6	74	88	0	0	0	**420**
% of Total		48	1	5	2	4			1	18	21				



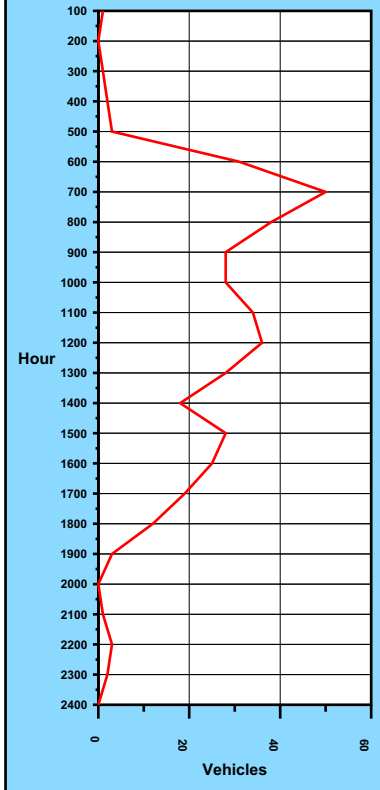
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

THU 20-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	1	0	0	0	0	0	0	0	1	1	0	0	0	**3**
5am - 6am	0	14	0	2	1	0	0	0	0	7	7	0	0	0	**31**
6am - 7am	0	14	0	2	1	6	0	0	1	12	14	0	0	0	**50**
7am - 8am	0	18	0	2	1	1	0	0	2	5	9	0	0	0	**38**
8am - 9am	0	10	1	0	1	2	0	0	0	8	6	0	0	0	**28**
9am - 10am	3	12	0	0	1	1	0	0	0	5	6	0	0	0	**28**
10am - 11am	0	4	0	3	1	5	0	0	0	9	12	0	0	0	**34**
11am - Midday	0	9	0	2	1	2	0	0	2	9	11	0	0	0	**36**
Midday - 1pm	0	8	1	1	0	0	0	0	0	10	8	0	0	0	**28**
1pm - 2pm	0	6	0	3	0	0	0	0	0	5	4	0	0	0	**18**
2pm - 3pm	0	7	0	4	1	1	0	0	1	6	8	0	0	0	**28**
3pm - 4pm	0	8	0	1	1	2	0	1	0	8	4	0	0	0	**25**
4pm - 5pm	0	9	1	3	0	0	0	0	0	3	3	0	0	0	**19**
5pm - 6pm	0	8	1	2	1	0	0	0	0	0	0	0	0	0	**12**
6pm - 7pm	0	2	0	1	0	0	0	0	0	0	0	0	0	0	**3**
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
9pm - 10pm	2	1	0	0	0	0	0	0	0	0	0	0	0	0	**3**
10pm - 11pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	5	138	4	26	10	20	0	1	6	88	93	0	0	0	**391**
% of Total	1	35	1	7	3	5			2	23	24				



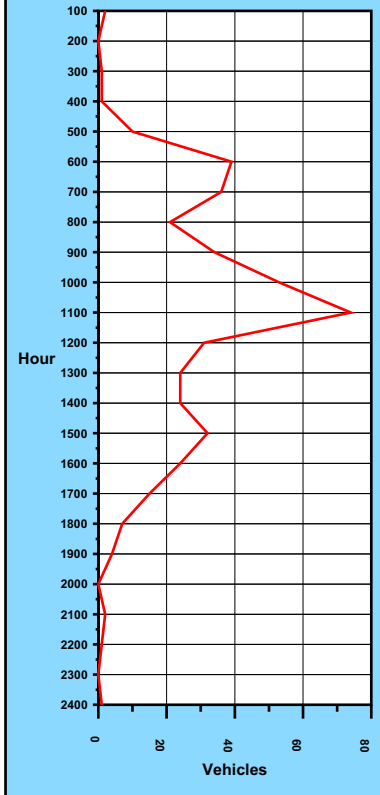
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

FRI 21-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	5	0	0	0	0	0	0	0	3	2	0	0	0	**10**
5am - 6am	0	14	0	1	0	0	0	0	1	12	11	0	0	0	**39**
6am - 7am	0	4	0	0	2	0	0	0	1	11	18	0	0	0	**36**
7am - 8am	0	9	0	1	1	2	0	0	0	5	3	0	0	0	**21**
8am - 9am	0	23	0	3	0	0	0	0	0	3	5	0	0	0	**34**
9am - 10am	0	28	0	1	0	0	0	0	4	9	11	0	0	0	**53**
10am - 11am	5	37	0	2	0	0	0	0	1	15	14	0	0	0	**74**
11am - Midday	0	7	1	2	1	1	0	0	0	7	12	0	0	0	**31**
Midday - 1pm	0	6	1	2	0	1	0	0	2	6	6	0	0	0	**24**
1pm - 2pm	0	5	0	3	1	0	0	0	1	8	5	1	0	0	**24**
2pm - 3pm	1	15	0	2	0	0	0	0	2	8	4	0	0	0	**32**
3pm - 4pm	0	13	1	2	1	0	0	0	1	3	3	0	0	0	**24**
4pm - 5pm	0	6	0	3	0	1	1	0	0	2	2	0	0	0	**15**
5pm - 6pm	0	6	0	1	0	0	0	0	0	0	0	0	0	0	**7**
6pm - 7pm	0	3	0	0	0	0	0	0	0	0	1	0	0	0	**4**
7pm - 8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8pm - 9pm	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	6	188	3	24	6	5	1	0	13	92	97	1	0	0	**436**
% of Total	1	43	1	6	1	1			3	21	22				



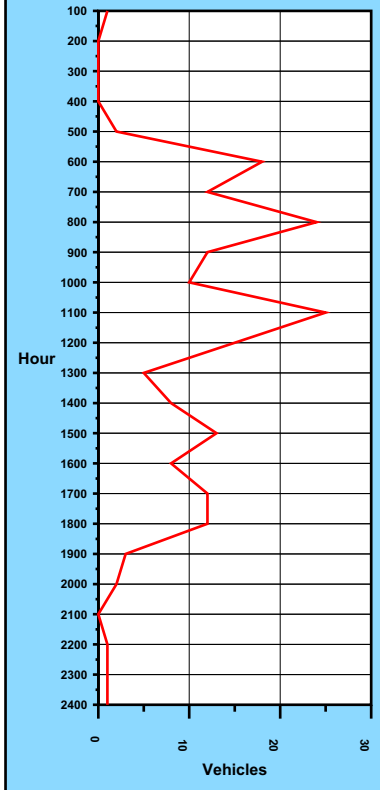
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

SAT 22-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	0	1	0	0	0	**2**
5am - 6am	4	8	0	0	1	0	0	0	0	0	5	0	0	0	**18**
6am - 7am	0	1	0	0	1	0	0	0	2	1	7	0	0	0	**12**
7am - 8am	0	10	0	1	0	2	0	0	1	8	2	0	0	0	**24**
8am - 9am	0	6	0	0	1	0	0	0	1	2	2	0	0	0	**12**
9am - 10am	1	4	2	0	0	0	0	0	0	0	3	0	0	0	**10**
10am - 11am	0	14	0	0	0	0	0	0	0	4	7	0	0	0	**25**
11am - Midday	0	9	0	1	0	2	0	0	0	1	2	0	0	0	**15**
Midday - 1pm	0	3	1	1	0	0	0	0	0	0	0	0	0	0	**5**
1pm - 2pm	0	7	0	1	0	0	0	0	0	0	0	0	0	0	**8**
2pm - 3pm	0	9	1	2	0	0	0	0	0	0	1	0	0	0	**13**
3pm - 4pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
4pm - 5pm	0	11	1	0	0	0	0	0	0	0	0	0	0	0	**12**
5pm - 6pm	0	10	1	1	0	0	0	0	0	0	0	0	0	0	**12**
6pm - 7pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7pm - 8pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8pm - 9pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	5	110	6	7	3	4	0	0	4	16	30	0	0	0	**185**
% of Total	3	59	3	4	2	2			2	9	16				



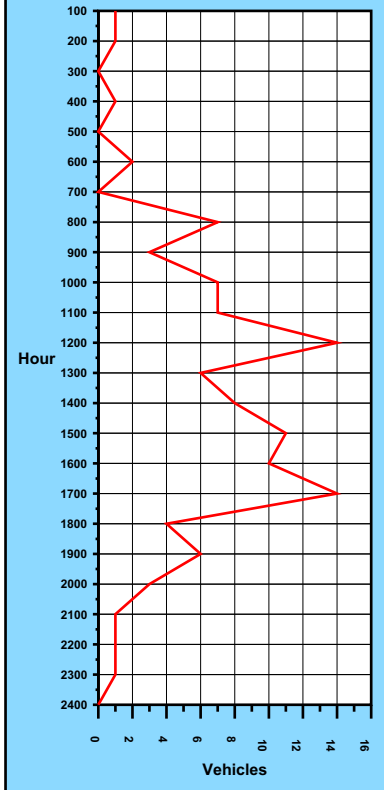
Count Number	**2531**	Ref : **EMM**	**Lat/Long : S34 41.250 / E150 00.177**	**GOOGLE MAP**
Street	**JOARAMIN ROAD, MARULAN : Between REDHILL HILL ROAD & BRAYTON ROAD (bidirectional) :**			
Location	Just east of bend south near Brayton Road, on Guard Rail.			*Carriageway*

SUN 23-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**86**
Weekly 85th Percentile Speed	**96**
Five Day ADT	**398**
Seven Day ADT	**326**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5am - 6am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
6am - 7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7am - 8am	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
8am - 9am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
9am - 10am	0	6	0	1	0	0	0	0	0	0	0	0	0	0	**7**
10am - 11am	0	5	0	2	0	0	0	0	0	0	0	0	0	0	**7**
11am - Midday	0	12	0	2	0	0	0	0	0	0	0	0	0	0	**14**
Midday - 1pm	0	4	0	0	0	1	0	0	1	0	0	0	0	0	**6**
1pm - 2pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
2pm - 3pm	1	8	1	1	0	0	0	0	0	0	0	0	0	0	**11**
3pm - 4pm	0	8	2	0	0	0	0	0	0	0	0	0	0	0	**10**
4pm - 5pm	0	12	1	1	0	0	0	0	0	0	0	0	0	0	**14**
5pm - 6pm	0	3	0	1	0	0	0	0	0	0	0	0	0	0	**4**
6pm - 7pm	0	4	0	1	0	1	0	0	0	0	0	0	0	0	**6**
7pm - 8pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
8pm - 9pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	89	4	11	0	2	0	0	1	0	0	0	0	0	**108**
% of Total	1	82	4	10		2			1						



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

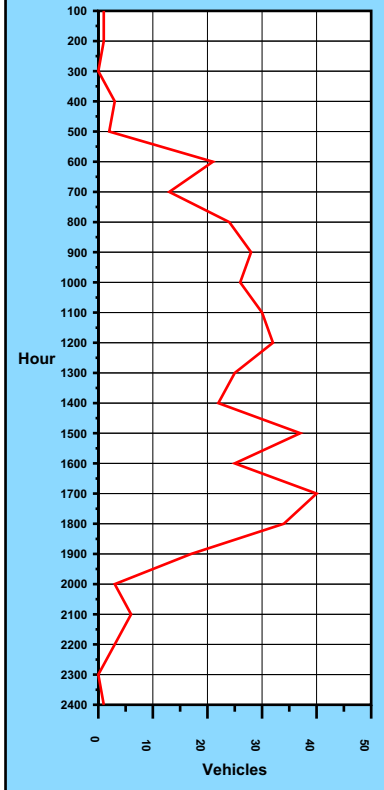
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.			*Carriageway*

MON 17-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	2	0	0	0	0	0	0	0	0	0	0	**3**
4am - 5am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5am - 6am	0	16	1	4	0	0	0	0	0	0	0	0	0	0	**21**
6am - 7am	0	12	0	1	0	0	0	0	0	0	0	0	0	0	**13**
7am - 8am	0	17	0	4	1	1	0	0	1	0	0	0	0	0	**24**
8am - 9am	4	17	1	5	0	0	0	0	0	1	0	0	0	0	**28**
9am - 10am	0	22	0	2	0	0	0	0	0	2	0	0	0	0	**26**
10am - 11am	1	22	1	4	0	2	0	0	0	0	0	0	0	0	**30**
11am - Midday	0	27	0	1	0	0	0	0	0	1	3	0	0	0	**32**
Midday - 1pm	0	22	0	2	0	0	0	0	0	1	0	0	0	0	**25**
1pm - 2pm	0	14	1	4	1	1	0	0	0	0	1	0	0	0	**22**
2pm - 3pm	2	23	1	7	2	0	0	0	0	0	2	0	0	0	**37**
3pm - 4pm	2	13	3	4	1	0	0	1	1	0	0	0	0	0	**25**
4pm - 5pm	2	27	0	5	2	0	0	1	0	2	1	0	0	0	**40**
5pm - 6pm	1	28	0	4	0	0	0	1	0	0	0	0	0	0	**34**
6pm - 7pm	0	15	0	2	0	0	0	0	0	0	0	0	0	0	**17**
7pm - 8pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
8pm - 9pm	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**
9pm - 10pm	0	2	0	0	0	0	0	0	0	0	1	0	0	0	**3**
10pm - 11pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11pm - Midnight	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Total	12	290	8	53	7	4	0	3	2	7	8	0	0	0	**394**
% of Total	3	74	2	13	2	1		1	1	2	2				



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

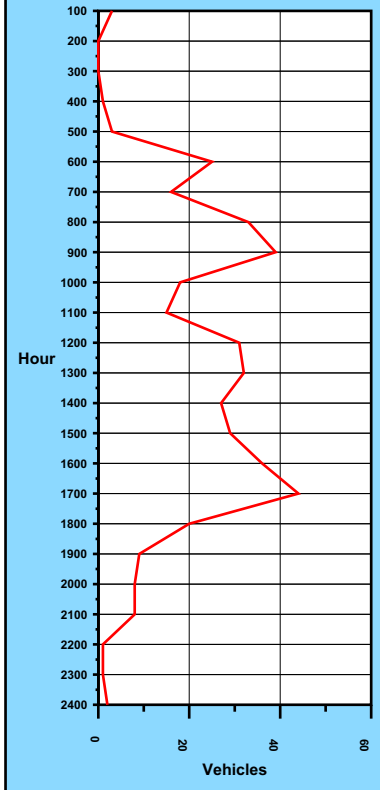
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.			*Carriageway*

TUE 18-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
5am - 6am	0	22	1	2	0	0	0	0	0	0	0	0	0	0	**25**
6am - 7am	0	10	0	1	1	1	0	1	0	0	2	0	0	0	**16**
7am - 8am	0	22	2	6	2	0	0	0	0	1	0	0	0	0	**33**
8am - 9am	2	32	0	4	0	0	0	0	1	0	0	0	0	0	**39**
9am - 10am	0	13	1	2	0	0	1	0	0	0	1	0	0	0	**18**
10am - 11am	0	13	1	0	1	0	0	0	0	0	0	0	0	0	**15**
11am - Midday	0	21	1	2	2	0	1	0	1	1	2	0	0	0	**31**
Midday - 1pm	0	22	2	3	2	1	1	0	0	1	0	0	0	0	**32**
1pm - 2pm	0	16	2	5	1	1	0	0	0	1	1	0	0	0	**27**
2pm - 3pm	0	23	1	3	2	0	0	0	0	0	0	0	0	0	**29**
3pm - 4pm	1	21	1	5	0	1	0	0	1	2	4	0	0	0	**36**
4pm - 5pm	0	37	0	4	1	0	0	0	0	0	2	0	0	0	**44**
5pm - 6pm	0	17	0	3	0	0	0	0	0	0	0	0	0	0	**20**
6pm - 7pm	0	6	1	1	0	0	0	0	0	0	1	0	0	0	**9**
7pm - 8pm	0	7	0	1	0	0	0	0	0	0	0	0	0	0	**8**
8pm - 9pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
9pm - 10pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Total	3	301	13	42	12	4	3	1	3	6	13	0	0	0	**401**
% of Total	1	75	3	10	3	1	1		1	1	3				



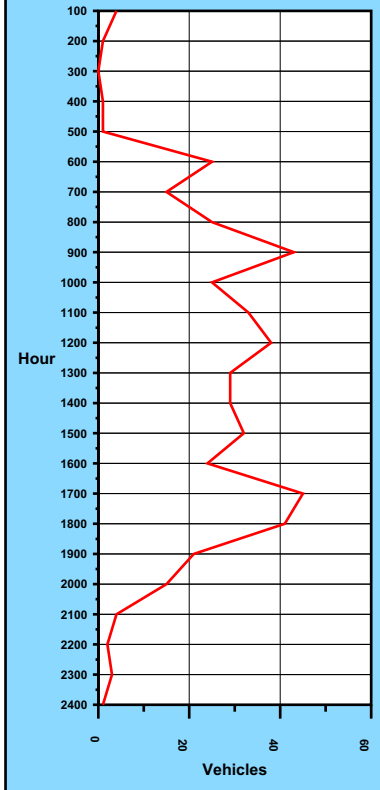
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

WED 19-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	19	0	5	0	0	0	0	1	0	0	0	0	0	**25**
6am - 7am	1	10	0	1	1	1	0	0	0	0	1	0	0	0	**15**
7am - 8am	0	14	0	8	1	1	0	0	0	0	1	0	0	0	**25**
8am - 9am	0	26	2	8	0	0	0	0	1	1	5	0	0	0	**43**
9am - 10am	0	22	0	1	1	0	0	0	0	0	1	0	0	0	**25**
10am - 11am	0	20	1	6	3	0	0	0	0	1	2	0	0	0	**33**
11am - Midday	0	32	2	2	1	0	0	0	1	0	0	0	0	0	**38**
Midday - 1pm	0	20	1	2	2	0	0	0	0	1	3	0	0	0	**29**
1pm - 2pm	0	21	0	4	3	0	0	0	1	0	0	0	0	0	**29**
2pm - 3pm	0	15	2	10	1	1	0	0	0	3	0	0	0	0	**32**
3pm - 4pm	0	15	2	6	0	0	0	0	0	1	0	0	0	0	**24**
4pm - 5pm	2	35	0	6	0	0	0	0	0	2	0	0	0	0	**45**
5pm - 6pm	0	34	0	6	0	1	0	0	0	0	0	0	0	0	**41**
6pm - 7pm	0	18	0	1	0	0	0	1	0	0	1	0	0	0	**21**
7pm - 8pm	0	13	0	2	0	0	0	0	0	0	0	0	0	0	**15**
8pm - 9pm	0	2	0	1	1	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	3	329	10	69	14	4	0	1	4	9	14	0	0	0	**457**
% of Total	1	72	2	15	3	1			1	2	3				



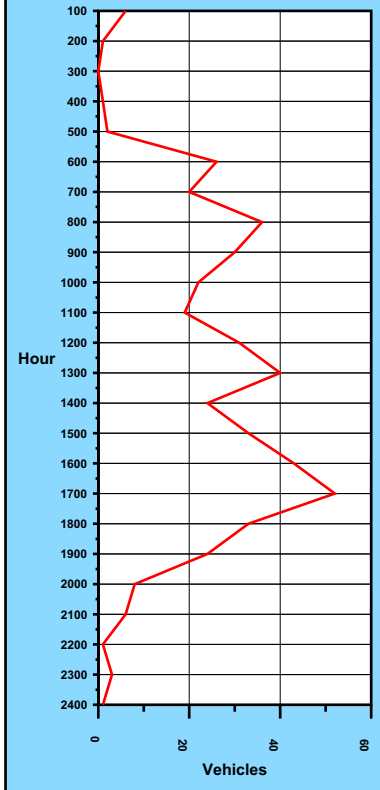
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

THU 20-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	2	4	0	0	0	0	0	0	0	0	0	0	0	0	**6**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5am - 6am	0	22	0	4	0	0	0	0	0	0	0	0	0	0	**26**
6am - 7am	0	13	0	1	2	1	0	0	0	2	1	0	0	0	**20**
7am - 8am	5	15	1	10	2	1	0	0	0	2	0	0	0	0	**36**
8am - 9am	1	22	1	5	0	0	0	0	1	0	0	0	0	0	**30**
9am - 10am	0	16	1	2	0	1	0	0	0	1	1	0	0	0	**22**
10am - 11am	0	12	1	3	0	1	0	0	0	0	2	0	0	0	**19**
11am - Midday	0	22	2	4	1	1	0	0	0	0	1	0	0	0	**31**
Midday - 1pm	0	29	2	4	1	1	0	0	1	1	1	0	0	0	**40**
1pm - 2pm	0	18	0	4	1	0	0	0	0	0	1	0	0	0	**24**
2pm - 3pm	0	13	2	10	1	2	0	0	2	2	1	0	0	0	**33**
3pm - 4pm	6	23	3	6	1	0	0	1	0	1	2	0	0	0	**43**
4pm - 5pm	0	43	1	5	2	0	0	0	0	1	0	0	0	0	**52**
5pm - 6pm	0	26	1	5	0	0	0	0	1	0	0	0	0	0	**33**
6pm - 7pm	0	21	0	3	0	0	0	0	0	0	0	0	0	0	**24**
7pm - 8pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
8pm - 9pm	0	5	0	0	1	0	0	0	0	0	0	0	0	0	**6**
9pm - 10pm	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	14	320	15	67	12	8	0	1	5	10	10	0	0	0	**462**
% of Total	3	69	3	15	3	2			1	2	2				



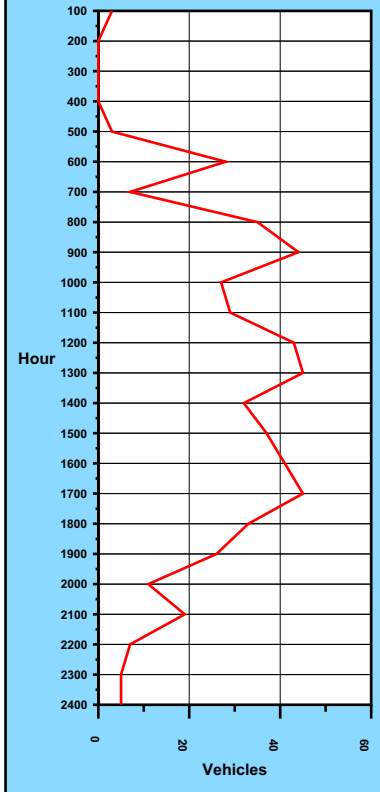
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

FRI 21-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
5am - 6am	0	24	2	1	1	0	0	0	0	0	0	0	0	0	**28**
6am - 7am	0	6	1	0	0	0	0	0	0	0	0	0	0	0	**7**
7am - 8am	0	22	1	7	2	0	1	0	1	1	0	0	0	0	**35**
8am - 9am	1	33	0	6	0	0	1	1	2	0	0	0	0	0	**44**
9am - 10am	0	22	2	3	0	0	0	0	0	0	0	0	0	0	**27**
10am - 11am	0	19	3	3	0	0	0	0	0	4	0	0	0	0	**29**
11am - Midday	0	30	3	4	3	0	0	0	1	2	0	0	0	0	**43**
Midday - 1pm	1	35	2	3	0	1	0	0	0	1	2	0	0	0	**45**
1pm - 2pm	0	18	2	6	2	1	0	0	1	2	0	0	0	0	**32**
2pm - 3pm	0	28	1	2	2	0	0	0	3	1	0	0	0	0	**37**
3pm - 4pm	0	29	2	4	1	0	0	1	1	2	1	0	0	0	**41**
4pm - 5pm	2	34	1	6	0	0	0	0	1	0	1	0	0	0	**45**
5pm - 6pm	0	30	2	0	1	0	0	0	0	0	0	0	0	0	**33**
6pm - 7pm	0	20	2	2	1	0	0	0	0	0	1	0	0	0	**26**
7pm - 8pm	0	11	0	0	0	0	0	0	0	0	0	0	0	0	**11**
8pm - 9pm	0	14	1	4	0	0	0	0	0	0	0	0	0	0	**19**
9pm - 10pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
10pm - 11pm	0	3	0	2	0	0	0	0	0	0	0	0	0	0	**5**
11pm - Midnight	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
Total	4	396	25	53	13	2	2	2	10	13	5	0	0	0	**525**
% of Total	1	75	5	10	2				2	2	1				



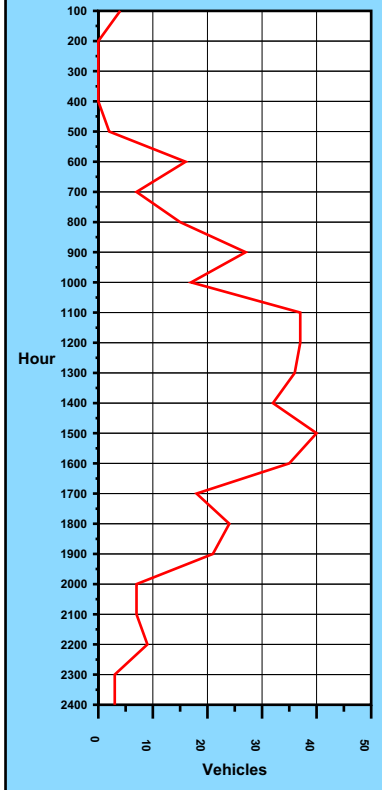
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065** **GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**		
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.		*Carriageway*

SAT 22-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5am - 6am	0	14	0	2	0	0	0	0	0	0	0	0	0	0	**16**
6am - 7am	0	4	0	1	2	0	0	0	0	0	0	0	0	0	**7**
7am - 8am	0	8	0	3	4	0	0	0	0	0	0	0	0	0	**15**
8am - 9am	0	18	2	2	3	0	0	0	0	1	1	0	0	0	**27**
9am - 10am	0	14	0	1	1	0	0	0	0	0	1	0	0	0	**17**
10am - 11am	1	29	2	2	0	0	1	0	0	1	1	0	0	0	**37**
11am - Midday	0	31	3	2	0	0	0	0	0	0	1	0	0	0	**37**
Midday - 1pm	1	32	2	1	0	0	0	0	0	0	0	0	0	0	**36**
1pm - 2pm	4	23	3	2	0	0	0	0	0	0	0	0	0	0	**32**
2pm - 3pm	0	34	4	2	0	0	0	0	0	0	0	0	0	0	**40**
3pm - 4pm	0	26	7	2	0	0	0	0	0	0	0	0	0	0	**35**
4pm - 5pm	0	13	4	1	0	0	0	0	0	0	0	0	0	0	**18**
5pm - 6pm	0	19	3	2	0	0	0	0	0	0	0	0	0	0	**24**
6pm - 7pm	0	21	0	0	0	0	0	0	0	0	0	0	0	0	**21**
7pm - 8pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
8pm - 9pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
9pm - 10pm	0	9	0	0	0	0	0	0	0	0	0	0	0	0	**9**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Total	6	321	30	23	10	0	1	0	0	2	4	0	0	0	**397**
% of Total	2	81	8	6	3					1	1				



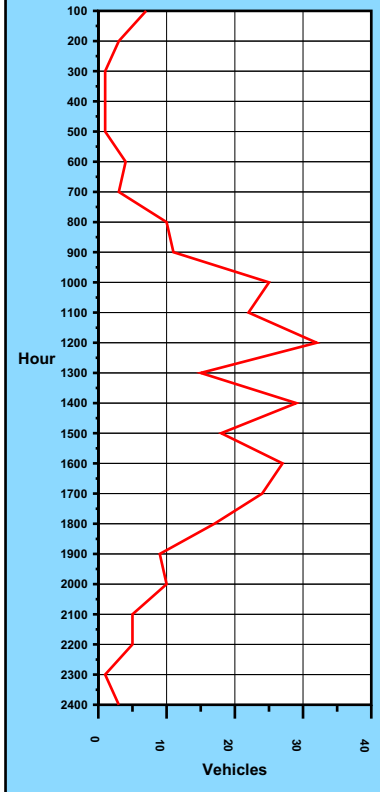
Count Number	**2532**	Ref : **EMM**	**Lat/Long : S34 41.731 / E150 00.065**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	Just south of Joaramin Road, 50 meters West of House No. 218 on Tree.			*Carriageway*

SUN 23-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**84**
Weekly 85th Percentile Speed	**98**
Five Day ADT	**448**
Seven Day ADT	**417**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
1am - 2am	0	2	0	1	0	0	0	0	0	0	0	0	0	0	**3**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	2	0	2	0	0	0	0	0	0	0	0	0	0	**4**
6am - 7am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7am - 8am	0	10	0	0	0	0	0	0	0	0	0	0	0	0	**10**
8am - 9am	0	8	2	1	0	0	0	0	0	0	0	0	0	0	**11**
9am - 10am	0	19	2	2	0	0	2	0	0	0	0	0	0	0	**25**
10am - 11am	0	16	3	3	0	0	0	0	0	0	0	0	0	0	**22**
11am - Midday	0	26	5	1	0	0	0	0	0	0	0	0	0	0	**32**
Midday - 1pm	0	13	1	1	0	0	0	0	0	0	0	0	0	0	**15**
1pm - 2pm	0	26	2	1	0	0	0	0	0	0	0	0	0	0	**29**
2pm - 3pm	0	17	1	0	0	0	0	0	0	0	0	0	0	0	**18**
3pm - 4pm	0	24	1	1	1	0	0	0	0	0	0	0	0	0	**27**
4pm - 5pm	0	18	1	5	0	0	0	0	0	0	0	0	0	0	**24**
5pm - 6pm	0	13	1	2	0	0	1	0	0	0	0	0	0	0	**17**
6pm - 7pm	0	6	1	1	0	1	0	0	0	0	0	0	0	0	**9**
7pm - 8pm	0	7	1	0	0	0	2	0	0	0	0	0	0	0	**10**
8pm - 9pm	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
9pm - 10pm	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	2	0	1	0	0	0	0	0	0	0	0	0	0	**3**
Total	0	232	21	23	1	1	5	0	0	0	0	0	0	0	**283**
% of Total		82	7	8			2								



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

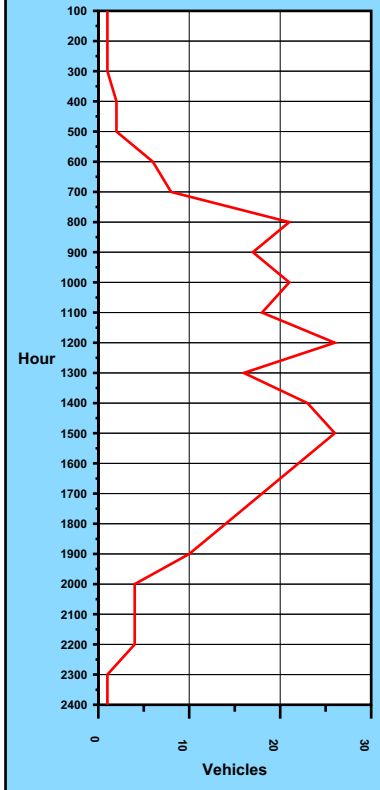
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

MON 17-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5am - 6am	0	4	0	2	0	0	0	0	0	0	0	0	0	0	**6**
6am - 7am	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
7am - 8am	0	14	1	6	0	0	0	0	0	0	0	0	0	0	**21**
8am - 9am	0	14	1	2	0	0	0	0	0	0	0	0	0	0	**17**
9am - 10am	0	19	0	2	0	0	0	0	0	0	0	0	0	0	**21**
10am - 11am	0	16	1	1	0	0	0	0	0	0	0	0	0	0	**18**
11am - Midday	0	23	2	1	0	0	0	0	0	0	0	0	0	0	**26**
Midday - 1pm	0	15	0	1	0	0	0	0	0	0	0	0	0	0	**16**
1pm - 2pm	0	19	0	3	0	0	1	0	0	0	0	0	0	0	**23**
2pm - 3pm	0	17	1	6	2	0	0	0	0	0	0	0	0	0	**26**
3pm - 4pm	0	16	2	4	0	0	0	0	0	0	0	0	0	0	**22**
4pm - 5pm	0	14	0	4	0	0	0	0	0	0	0	0	0	0	**18**
5pm - 6pm	0	11	1	2	0	0	0	0	0	0	0	0	0	0	**14**
6pm - 7pm	0	9	0	1	0	0	0	0	0	0	0	0	0	0	**10**
7pm - 8pm	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
8pm - 9pm	0	3	0	1	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	3	0	0	0	0	0	0	0	0	1	0	0	0	**4**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Total	0	216	9	38	2	0	1	0	0	0	1	0	0	0	**267**
% of Total		81	3	14	1										



Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

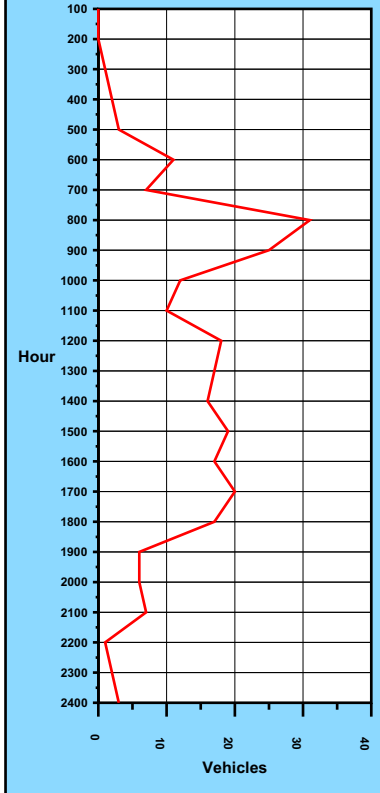
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

TUE 18-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
5am - 6am	0	11	0	0	0	0	0	0	0	0	0	0	0	0	**11**
6am - 7am	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
7am - 8am	0	21	3	6	0	0	0	0	0	0	1	0	0	0	**31**
8am - 9am	0	20	0	4	0	0	0	0	0	1	0	0	0	0	**25**
9am - 10am	0	8	1	2	0	0	1	0	0	0	0	0	0	0	**12**
10am - 11am	0	8	1	1	0	0	0	0	0	0	0	0	0	0	**10**
11am - Midday	0	14	2	1	1	0	0	0	0	0	0	0	0	0	**18**
Midday - 1pm	0	10	2	4	1	0	0	0	0	0	0	0	0	0	**17**
1pm - 2pm	0	11	2	3	0	0	0	0	0	0	0	0	0	0	**16**
2pm - 3pm	0	17	0	1	0	0	1	0	0	0	0	0	0	0	**19**
3pm - 4pm	0	12	0	5	0	0	0	0	0	0	0	0	0	0	**17**
4pm - 5pm	0	17	0	3	0	0	0	0	0	0	0	0	0	0	**20**
5pm - 6pm	0	14	1	2	0	0	0	0	0	0	0	0	0	0	**17**
6pm - 7pm	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**
7pm - 8pm	0	4	1	0	0	0	1	0	0	0	0	0	0	0	**6**
8pm - 9pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
9pm - 10pm	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
10pm - 11pm	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**2**
11pm - Midnight	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Total	0	194	13	36	2	0	4	0	0	1	1	0	0	0	**251**
% of Total		77	5	14	1		2								



CfeIT bob.white@cfeit.com (02) 9740 8600

Classification Data

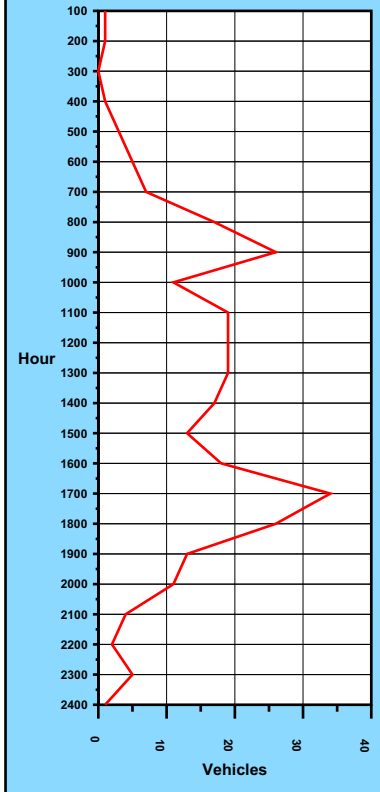
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

WED 19-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
4am - 5am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
5am - 6am	0	4	0	1	0	0	0	0	0	0	0	0	0	0	**5**
6am - 7am	0	6	0	0	0	0	0	0	1	0	0	0	0	0	**7**
7am - 8am	0	12	0	5	0	0	0	0	0	0	0	0	0	0	**17**
8am - 9am	0	20	3	3	0	0	0	0	0	0	0	0	0	0	**26**
9am - 10am	0	10	0	1	0	0	0	0	0	0	0	0	0	0	**11**
10am - 11am	0	14	0	4	1	0	0	0	0	0	0	0	0	0	**19**
11am - Midday	0	13	2	3	0	1	0	0	0	0	0	0	0	0	**19**
Midday - 1pm	0	15	1	3	0	0	0	0	0	0	0	0	0	0	**19**
1pm - 2pm	0	13	1	3	0	0	0	0	0	0	0	0	0	0	**17**
2pm - 3pm	0	9	0	3	0	1	0	0	0	0	0	0	0	0	**13**
3pm - 4pm	0	12	2	4	0	0	0	0	0	0	0	0	0	0	**18**
4pm - 5pm	0	32	0	2	0	0	0	0	0	0	0	0	0	0	**34**
5pm - 6pm	0	23	1	2	0	0	0	0	0	0	0	0	0	0	**26**
6pm - 7pm	0	13	0	0	0	0	0	0	0	0	0	0	0	0	**13**
7pm - 8pm	0	10	0	1	0	0	0	0	0	0	0	0	0	0	**11**
8pm - 9pm	0	2	0	2	0	0	0	0	0	0	0	0	0	0	**4**
9pm - 10pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
10pm - 11pm	0	3	0	2	0	0	0	0	0	0	0	0	0	0	**5**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	0	219	10	40	1	2	0	0	1	0	0	0	0	0	**273**
% of Total		80	4	15		1									



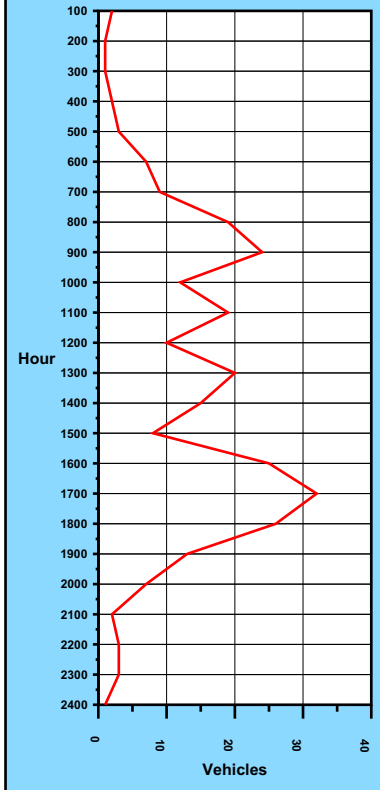
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

THU 20-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
4am - 5am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
5am - 6am	0	4	0	3	0	0	0	0	0	0	0	0	0	0	**7**
6am - 7am	0	8	0	1	0	0	0	0	0	0	0	0	0	0	**9**
7am - 8am	0	11	1	7	0	0	0	0	0	0	0	0	0	0	**19**
8am - 9am	0	17	2	5	0	0	0	0	0	0	0	0	0	0	**24**
9am - 10am	0	10	1	1	0	0	0	0	0	0	0	0	0	0	**12**
10am - 11am	0	13	2	4	0	0	0	0	0	0	0	0	0	0	**19**
11am - Midday	0	8	1	1	0	0	0	0	0	0	0	0	0	0	**10**
Midday - 1pm	0	17	1	2	0	0	0	0	0	0	0	0	0	0	**20**
1pm - 2pm	0	11	0	4	0	0	0	0	0	0	0	0	0	0	**15**
2pm - 3pm	0	5	2	0	0	0	0	0	1	0	0	0	0	0	**8**
3pm - 4pm	0	17	3	5	0	0	0	0	0	0	0	0	0	0	**25**
4pm - 5pm	0	26	2	4	0	0	0	0	0	0	0	0	0	0	**32**
5pm - 6pm	0	20	2	3	0	0	0	0	1	0	0	0	0	0	**26**
6pm - 7pm	0	12	0	1	0	0	0	0	0	0	0	0	0	0	**13**
7pm - 8pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
8pm - 9pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
9pm - 10pm	0	2	0	1	0	0	0	0	0	0	0	0	0	0	**3**
10pm - 11pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
11pm - Midnight	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Total	0	203	17	42	0	0	0	0	2	0	0	0	0	0	**264**
% of Total		77	6	16					1						



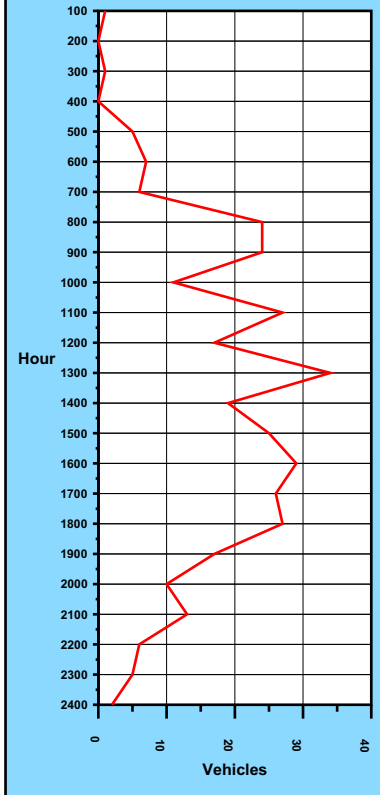
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

FRI 21-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1am - 2am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
5am - 6am	0	4	2	1	0	0	0	0	0	0	0	0	0	0	**7**
6am - 7am	0	5	1	0	0	0	0	0	0	0	0	0	0	0	**6**
7am - 8am	0	17	1	6	0	0	0	0	0	0	0	0	0	0	**24**
8am - 9am	0	19	0	5	0	0	0	0	0	0	0	0	0	0	**24**
9am - 10am	0	9	1	1	0	0	0	0	0	0	0	0	0	0	**11**
10am - 11am	0	17	5	3	0	0	0	0	0	2	0	0	0	0	**27**
11am - Midday	0	13	3	1	0	0	0	0	0	0	0	0	0	0	**17**
Midday - 1pm	1	25	3	5	0	0	0	0	0	0	0	0	0	0	**34**
1pm - 2pm	0	10	2	3	0	0	1	1	1	1	0	0	0	0	**19**
2pm - 3pm	0	24	1	0	0	0	0	0	0	0	0	0	0	0	**25**
3pm - 4pm	0	24	1	4	0	0	0	0	0	0	0	0	0	0	**29**
4pm - 5pm	0	19	1	6	0	0	0	0	0	0	0	0	0	0	**26**
5pm - 6pm	0	24	2	1	0	0	0	0	0	0	0	0	0	0	**27**
6pm - 7pm	0	14	1	2	0	0	0	0	0	0	0	0	0	0	**17**
7pm - 8pm	0	10	0	0	0	0	0	0	0	0	0	0	0	0	**10**
8pm - 9pm	0	10	1	2	0	0	0	0	0	0	0	0	0	0	**13**
9pm - 10pm	0	5	0	1	0	0	0	0	0	0	0	0	0	0	**6**
10pm - 11pm	0	3	0	2	0	0	0	0	0	0	0	0	0	0	**5**
11pm - Midnight	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Total	1	261	25	43	0	0	1	1	1	3	0	0	0	0	**336**
% of Total		78	7	13						1					



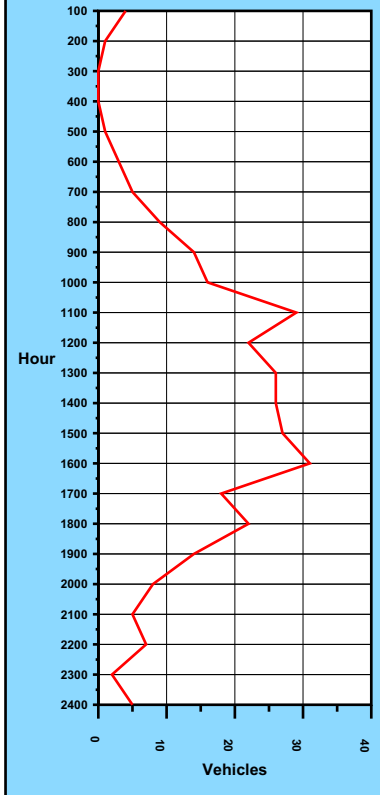
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

SAT 22-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**
1am - 2am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
6am - 7am	0	2	0	1	1	0	1	0	0	0	0	0	0	0	**5**
7am - 8am	0	7	0	1	1	0	0	0	0	0	0	0	0	0	**9**
8am - 9am	0	10	2	1	1	0	0	0	0	0	0	0	0	0	**14**
9am - 10am	1	11	2	1	1	0	0	0	0	0	0	0	0	0	**16**
10am - 11am	0	26	2	1	0	0	0	0	0	0	0	0	0	0	**29**
11am - Midday	0	16	3	3	0	0	0	0	0	0	0	0	0	0	**22**
Midday - 1pm	0	23	2	1	0	0	0	0	0	0	0	0	0	0	**26**
1pm - 2pm	5	17	2	2	0	0	0	0	0	0	0	0	0	0	**26**
2pm - 3pm	0	21	4	2	0	0	0	0	0	0	0	0	0	0	**27**
3pm - 4pm	0	21	6	4	0	0	0	0	0	0	0	0	0	0	**31**
4pm - 5pm	0	16	2	0	0	0	0	0	0	0	0	0	0	0	**18**
5pm - 6pm	0	19	2	1	0	0	0	0	0	0	0	0	0	0	**22**
6pm - 7pm	0	14	0	0	0	0	0	0	0	0	0	0	0	0	**14**
7pm - 8pm	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**8**
8pm - 9pm	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
9pm - 10pm	0	7	0	0	0	0	0	0	0	0	0	0	0	0	**7**
10pm - 11pm	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
11pm - Midnight	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
Total	6	239	27	18	4	0	1	0	0	0	0	0	0	0	**295**
% of Total	2	81	9	6	1										



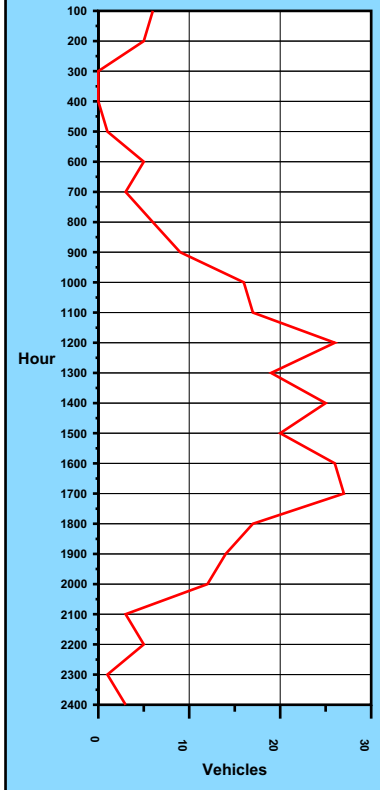
Count Number	**2533**	Ref : **EMM**	**Lat/Long : S34 39.274 / E149 58.386**	**GOOGLE MAP**
Street	**BRAYTON ROAD, MARULAN : Between GEORGE STREET & BRAYTON (bidirectional) :**			
Location	800 Meters, from Gunlake Mine access, on Tree.			*Carriageway*

SUN 23-AUG-15

Start Date	17-AUG-15
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**88**
Weekly 85th Percentile Speed	**103**
Five Day ADT	**278**
Seven Day ADT	**279**

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
Midnight - 1am	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**
1am - 2am	0	3	0	2	0	0	0	0	0	0	0	0	0	0	**5**
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3am - 4am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5am - 6am	0	4	0	1	0	0	0	0	0	0	0	0	0	0	**5**
6am - 7am	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7am - 8am	0	5	1	0	0	0	0	0	0	0	0	0	0	0	**6**
8am - 9am	0	7	1	1	0	0	0	0	0	0	0	0	0	0	**9**
9am - 10am	0	10	2	2	0	0	2	0	0	0	0	0	0	0	**16**
10am - 11am	0	15	2	0	0	0	0	0	0	0	0	0	0	0	**17**
11am - Midday	0	19	5	2	0	0	0	0	0	0	0	0	0	0	**26**
Midday - 1pm	0	14	1	2	0	0	0	0	2	0	0	0	0	0	**19**
1pm - 2pm	0	21	2	2	0	0	0	0	0	0	0	0	0	0	**25**
2pm - 3pm	0	18	1	1	0	0	0	0	0	0	0	0	0	0	**20**
3pm - 4pm	0	24	1	1	0	0	0	0	0	0	0	0	0	0	**26**
4pm - 5pm	0	21	1	5	0	0	0	0	0	0	0	0	0	0	**27**
5pm - 6pm	0	12	1	3	0	0	1	0	0	0	0	0	0	0	**17**
6pm - 7pm	0	11	1	2	0	0	0	0	0	0	0	0	0	0	**14**
7pm - 8pm	0	9	2	0	0	0	1	0	0	0	0	0	0	0	**12**
8pm - 9pm	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
9pm - 10pm	0	3	0	2	0	0	0	0	0	0	0	0	0	0	**5**
10pm - 11pm	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
11pm - Midnight	0	1	0	2	0	0	0	0	0	0	0	0	0	0	**3**
Total	0	211	21	28	0	0	4	0	2	0	0	0	0	0	**266**
% of Total		79	8	11			2		1						



Appendix D

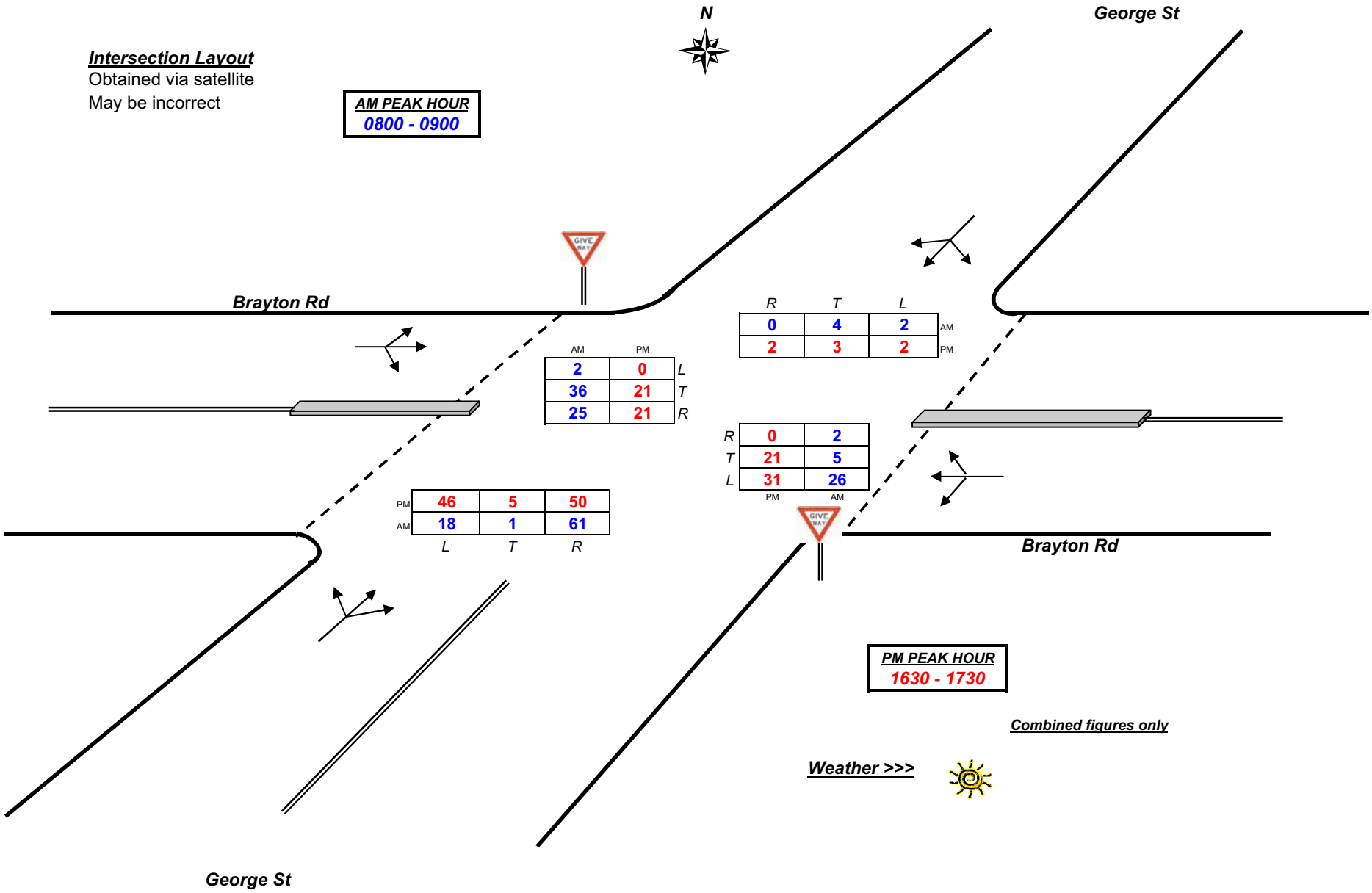
Intersection Traffic Counts

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

Intersection Layout
Obtained via satellite
May be incorrect

AM PEAK HOUR
0800 - 0900



AM	PM	
2	0	L
36	21	T
25	21	R

	R	T	L	
	0	4	2	AM
	2	3	2	PM

R	0	2	
T	21	5	
L	31	26	
	PM	AM	

PM	46	5	50
AM	18	1	61
	L	T	R

PM PEAK HOUR
1630 - 1730

Combined figures only

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

Lights

Time Per	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0615	0	0	0	0	10	2	3	0	3	0	0	0	**18**
0615 - 0630	0	0	0	0	9	0	2	0	4	2	0	0	**17**
0630 - 0645	1	0	0	0	9	1	2	1	9	2	1	0	**26**
0645 - 0700	0	1	1	0	5	2	2	0	11	3	0	1	**26**
0700 - 0715	0	0	0	0	4	1	4	0	13	2	1	0	**25**
0715 - 0730	0	0	0	0	4	5	2	0	8	2	1	1	**23**
0730 - 0745	1	1	0	0	13	4	4	3	14	6	1	0	**47**
0745 - 0800	0	0	1	0	8	10	6	0	6	7	1	0	**39**
0800 - 0815	0	1	0	1	10	4	4	1	20	7	1	0	**49**
0815 - 0830	0	0	0	0	8	4	2	0	12	8	1	0	**35**
0830 - 0845	0	3	0	0	8	6	5	0	13	4	1	2	**42**
0845 - 0900	1	0	0	1	10	8	5	0	13	7	1	0	**46**
Period End	**3**	**6**	**2**	**2**	**98**	**47**	**41**	**5**	**126**	**50**	**9**	**4**	**393**

Lights

Peak Time	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0700	1	1	1	0	33	5	9	1	27	7	1	1	**87**
0615 - 0715	1	1	1	0	27	4	10	1	37	9	2	1	**94**
0630 - 0730	1	1	1	0	22	9	10	1	41	9	3	2	**100**
0645 - 0745	1	2	1	0	26	12	12	3	46	13	3	2	**121**
0700 - 0800	1	1	1	0	29	20	16	3	41	17	4	1	**134**
0715 - 0815	1	2	1	1	35	23	16	4	48	22	4	1	**158**
0730 - 0830	1	2	1	1	39	22	16	4	52	28	4	0	**170**
0745 - 0845	0	4	1	1	34	24	17	1	51	26	4	2	**165**
0800 - 0900	1	4	0	2	36	22	16	1	58	26	4	2	**172**
PEAK HOUR	**1**	**4**	**0**	**2**	**36**	**22**	**16**	**1**	**58**	**26**	**4**	**2**	**172**

Heavies

Time Per	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0615	0	0	0	0	0	0	2	0	0	0	0	0	**2**
0615 - 0630	0	0	0	0	0	0	1	0	0	1	0	0	**2**
0630 - 0645	0	0	0	0	0	0	1	0	0	0	0	0	**1**
0645 - 0700	0	0	0	0	1	0	2	0	0	0	2	0	**5**
0700 - 0715	0	0	0	0	0	0	1	0	0	0	0	0	**1**
0715 - 0730	0	0	0	0	0	0	0	0	2	0	0	0	**2**
0730 - 0745	0	0	1	0	0	0	1	1	0	0	0	0	**3**
0745 - 0800	0	0	0	0	0	0	0	0	0	1	1	0	**2**
0800 - 0815	1	0	0	0	0	1	1	0	1	0	0	0	**4**
0815 - 0830	0	0	0	0	0	1	1	0	0	0	0	0	**2**
0830 - 0845	0	0	0	0	0	0	0	0	1	0	0	0	**1**
0845 - 0900	0	0	0	0	0	1	0	0	1	0	1	0	**3**
Period End	**1**	**0**	**1**	**0**	**1**	**3**	**10**	**1**	**5**	**2**	**4**	**0**	**28**

Heavies

Peak Per	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0700	0	0	0	0	1	0	6	0	0	1	2	0	**10**
0615 - 0715	0	0	0	0	1	0	5	0	0	1	2	0	**9**
0630 - 0730	0	0	0	0	1	0	4	0	2	0	2	0	**9**
0645 - 0745	0	0	1	0	1	0	4	1	2	0	2	0	**11**
0700 - 0800	0	0	1	0	0	0	2	1	2	1	1	0	**8**
0715 - 0815	1	0	1	0	0	1	2	1	3	1	1	0	**11**
0730 - 0830	1	0	1	0	0	2	3	1	1	1	1	0	**11**
0745 - 0845	1	0	0	0	0	2	2	0	2	1	1	0	**9**
0800 - 0900	1	0	0	0	0	3	2	0	3	0	1	0	**10**
PEAK HOUR	**1**	**0**	**0**	**3**	**0**	**3**	**2**	**0**	**3**	**0**	**1**	**0**	**10**

Combined

Time Per	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0615	0	0	0	0	10	2	5	0	3	0	0	0	**20**
0615 - 0630	0	0	0	0	9	0	3	0	4	3	0	0	**19**
0630 - 0645	1	0	0	0	9	1	3	1	9	2	1	0	**27**
0645 - 0700	0	1	1	0	6	2	4	0	11	3	2	1	**31**
0700 - 0715	0	0	0	0	4	1	5	0	13	2	1	0	**26**
0715 - 0730	0	0	0	0	4	5	2	0	10	2	1	1	**25**
0730 - 0745	1	1	1	0	13	4	5	4	14	6	1	0	**50**
0745 - 0800	0	0	1	0	8	10	6	0	6	8	2	0	**41**
0800 - 0815	1	1	0	1	10	5	5	1	21	7	1	0	**53**
0815 - 0830	0	0	0	0	8	5	3	0	12	8	1	0	**37**
0830 - 0845	0	3	0	0	8	6	5	0	14	4	1	2	**43**
0845 - 0900	1	0	0	1	10	9	5	0	14	7	2	0	**49**
Period End	**4**	**6**	**3**	**2**	**99**	**50**	**51**	**6**	**131**	**52**	**13**	**4**	**421**

Combined

Peak Per	NORTH George St L	NORTH George St T	NORTH George St R	WEST Brayton Rd L	WEST Brayton Rd T	WEST Brayton Rd R	SOUTH George St L	SOUTH George St T	SOUTH George St R	EAST Brayton Rd L	EAST Brayton Rd T	EAST Brayton Rd R	TOT
0600 - 0700	1	1	1	0	34	5	15	1	27	8	3	1	**97**
0615 - 0715	1	1	1	0	28	4	15	1	37	10	4	1	**103**
0630 - 0730	1	1	1	0	23	9	14	1	43	9	5	2	**109**
0645 - 0745	1	2	2	0	27	12	16	4	48	13	5	2	**132**
0700 - 0800	1	1	2	0	29	20	18	4	43	18	5	1	**142**
0715 - 0815	2	2	2	1	35	24	18	5	51	23	5	1	**169**
0730 - 0830	2	2	2	1	39	24	19	5	53	29	5	0	**181**
0745 - 0845	1	4	1	1	34	26	19	1	53	27	5	2	**174**
0800 - 0900	2	4	0	2	36	25	18	1	61	26	5	2	**182**
PEAK HOUR	**2**	**4**	**0**	**2**	**36**	**25**	**18**	**1**	**61**	**26**	**5**	**2**	**182**

R.O.A.R DATA

Reliable, Original & Authentic Results

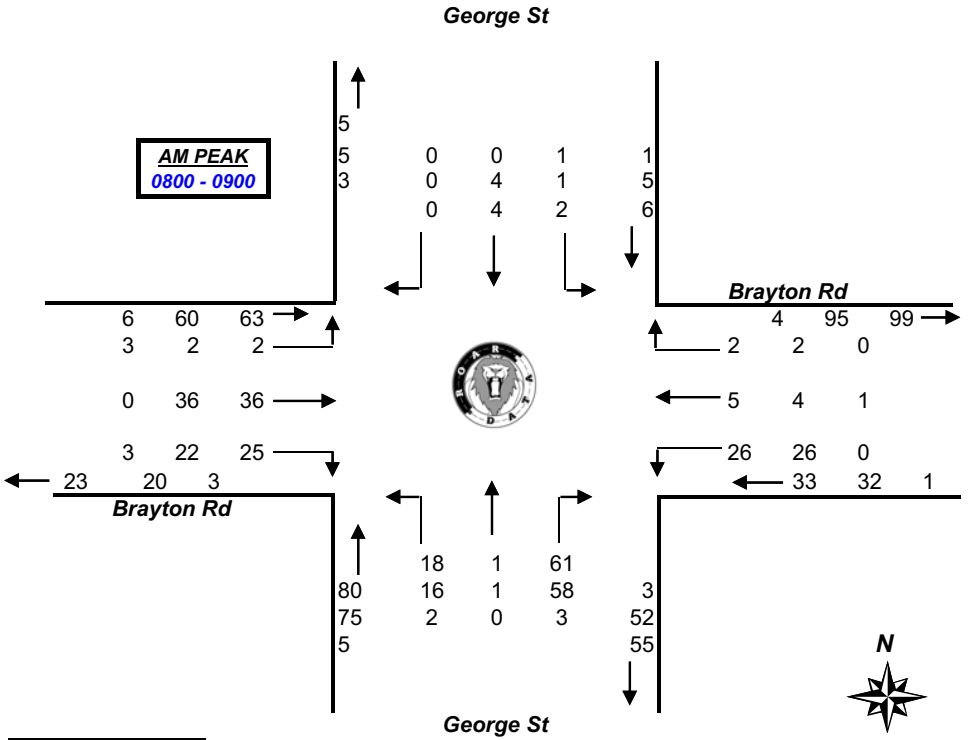
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

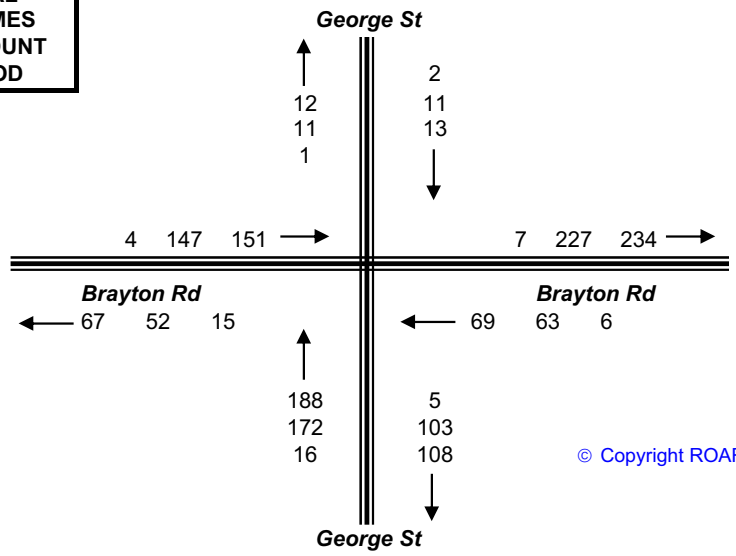
Peds	NORTH	WEST	SOUTH	EAST	
	George St	*Brayton Rd*	*George St*	*Brayton Rd*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0600 - 0615					**0**
0615 - 0630					**0**
0630 - 0645					**0**
0645 - 0700					**0**
0700 - 0715		NOT	NOT		**0**
0715 - 0730		REQUIRED	REQUIRED		**0**
0730 - 0745					**0**
0745 - 0800					**0**
0800 - 0815					**0**
0815 - 0830					**0**
0830 - 0845					**0**
0845 - 0900					**0**
Period End	**0**	**0**	**0**	**0**	**0**

Peds	NORTH	WEST	SOUTH	EAST	
	George St	*Brayton Rd*	*George St*	*Brayton Rd*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0600 - 0700	0	0	0	0	**0**
0615 - 0715	0	0	0	0	**0**
0630 - 0730	0	0	0	0	**0**
0645 - 0745	0	0	0	0	**0**
0700 - 0800	0	0	0	0	**0**
0715 - 0815	0	0	0	0	**0**
0730 - 0830	0	0	0	0	**0**
0745 - 0845	0	0	0	0	**0**
0800 - 0900	0	0	0	0	**0**

PEAK HR	**0**	**0**	**0**	**0**	**0**



TOTAL VOLUMES FOR COUNT PERIOD



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

Lights

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1445	0	1	0	0	5	3	5	1	14	11	2	0	**42**
1445 - 1500	0	0	0	0	5	11	8	0	15	5	1	1	**46**
1500 - 1515	0	2	0	0	5	4	7	2	24	8	3	0	**55**
1515 - 1530	0	0	0	0	2	4	11	0	11	8	4	0	**40**
1530 - 1545	0	1	0	0	2	4	14	1	9	3	2	2	**38**
1545 - 1600	0	0	0	0	11	1	9	0	11	10	4	0	**46**
1600 - 1615	0	2	0	0	2	8	7	0	18	8	3	0	**48**
1615 - 1630	0	3	0	0	2	5	6	1	13	5	0	1	**36**
1630 - 1645	0	1	0	0	6	6	14	3	8	5	3	0	**46**
1645 - 1700	0	2	2	0	2	3	8	0	11	7	7	0	**42**
1700 - 1715	0	0	0	0	8	6	12	0	12	8	5	0	**51**
1715 - 1730	0	0	0	0	3	3	12	1	17	7	4	0	**47**
Period End	**0**	**12**	**2**	**0**	**53**	**58**	**113**	**9**	**163**	**85**	**38**	**4**	**537**

Lights

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1530	0	3	0	0	17	22	31	3	64	32	10	1	**183**
1445 - 1545	0	3	0	0	14	23	40	3	59	24	10	3	**179**
1500 - 1600	0	3	0	0	20	13	41	3	55	29	13	2	**179**
1515 - 1615	0	3	0	0	17	17	41	1	49	29	13	2	**172**
1530 - 1630	0	6	0	0	17	18	36	2	51	26	9	3	**168**
1545 - 1645	0	6	0	0	21	20	36	4	50	28	10	1	**176**
1600 - 1700	0	8	2	0	12	22	35	4	50	25	13	1	**172**
1615 - 1715	0	6	2	0	18	20	40	4	44	25	15	1	**175**
1630 - 1730	0	3	2	0	19	18	46	4	48	27	19	0	**186**
PEAK HOUR	**0**	**3**	**2**	**0**	**19**	**18**	**46**	**4**	**48**	**27**	**19**	**0**	**186**

Heavies

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1445	0	0	0	0	1	0	0	0	0	0	0	0	**1**
1445 - 1500	0	0	0	0	1	0	1	0	0	0	0	0	**2**
1500 - 1515	0	0	0	0	1	0	2	0	0	0	1	0	**4**
1515 - 1530	0	0	0	0	2	0	0	0	0	1	2	0	**5**
1530 - 1545	0	0	0	0	2	0	0	1	2	0	0	0	**5**
1545 - 1600	0	0	0	0	3	0	0	1	0	2	1	0	**7**
1600 - 1615	1	0	0	0	0	0	0	0	2	1	0	0	**4**
1615 - 1630	0	0	0	0	1	0	0	0	2	0	1	0	**4**
1630 - 1645	1	0	0	0	2	2	0	0	0	3	1	0	**9**
1645 - 1700	0	0	0	0	0	1	0	0	1	0	1	0	**3**
1700 - 1715	0	0	0	0	0	0	0	1	1	1	0	0	**3**
1715 - 1730	1	0	0	0	0	0	0	0	0	0	0	0	**1**
Period End	**3**	**0**	**0**	**0**	**13**	**3**	**3**	**3**	**8**	**8**	**7**	**0**	**48**

Heavies

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1530	0	0	0	0	5	0	3	0	0	1	3	0	**12**
1445 - 1545	0	0	0	0	6	0	3	1	2	1	3	0	**16**
1500 - 1600	0	0	0	0	8	0	2	2	2	3	4	0	**21**
1515 - 1615	1	0	0	0	7	0	0	2	4	4	3	0	**21**
1530 - 1630	1	0	0	0	6	0	0	2	6	3	2	0	**20**
1545 - 1645	2	0	0	0	6	2	0	1	4	6	3	0	**24**
1600 - 1700	2	0	0	0	3	3	0	0	5	4	3	0	**20**
1615 - 1715	1	0	0	0	3	3	0	1	4	4	3	0	**19**
1630 - 1730	2	0	0	0	2	3	0	1	2	4	2	0	**16**
PEAK HOUR	**2**	**0**	**0**	**2**	**2**	**3**	**0**	**1**	**2**	**4**	**2**	**0**	**16**

Combined

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1445	0	1	0	0	6	3	5	1	14	11	2	0	**43**
1445 - 1500	0	0	0	0	6	11	9	0	15	5	1	1	**48**
1500 - 1515	0	2	0	0	6	4	9	2	24	8	4	0	**59**
1515 - 1530	0	0	0	0	4	4	11	0	11	9	6	0	**45**
1530 - 1545	0	1	0	0	4	4	14	2	11	3	2	2	**43**
1545 - 1600	0	0	0	0	14	1	9	1	11	12	5	0	**53**
1600 - 1615	1	2	0	0	2	8	7	0	20	9	3	0	**52**
1615 - 1630	0	3	0	0	3	5	6	1	15	5	1	1	**40**
1630 - 1645	1	1	0	0	8	8	14	3	8	8	4	0	**55**
1645 - 1700	0	2	2	0	2	4	8	0	12	7	8	0	**45**
1700 - 1715	0	0	0	0	8	6	12	1	13	9	5	0	**54**
1715 - 1730	1	0	0	0	3	3	12	1	17	7	4	0	**48**
Period End	**3**	**12**	**2**	**0**	**66**	**61**	**116**	**12**	**171**	**93**	**45**	**4**	**585**

Combined

	NORTH			WEST			SOUTH			EAST			
	George St			*Brayton Rd*			*George St*			*Brayton Rd*			
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1430 - 1530	0	3	0	0	22	22	34	3	64	33	13	1	**195**
1445 - 1545	0	3	0	0	20	23	43	4	61	25	13	3	**195**
1500 - 1600	0	3	0	0	28	13	43	5	57	32	17	2	**200**
1515 - 1615	1	3	0	0	24	17	41	3	53	33	16	2	**193**
1530 - 1630	1	6	0	0	23	18	36	4	57	29	11	3	**188**
1545 - 1645	2	6	0	0	27	22	36	5	54	34	13	1	**200**
1600 - 1700	2	8	2	0	15	25	35	4	55	29	16	1	**192**
1615 - 1715	1	6	2	0	21	23	40	5	48	29	18	1	**194**
1630 - 1730	2	3	2	0	21	21	46	5	50	31	21	0	**202**
PEAK HOUR	**2**	**3**	**2**	**0**	**21**	**21**	**46**	**5**	**50**	**31**	**21**	**0**	**202**

R.O.A.R DATA

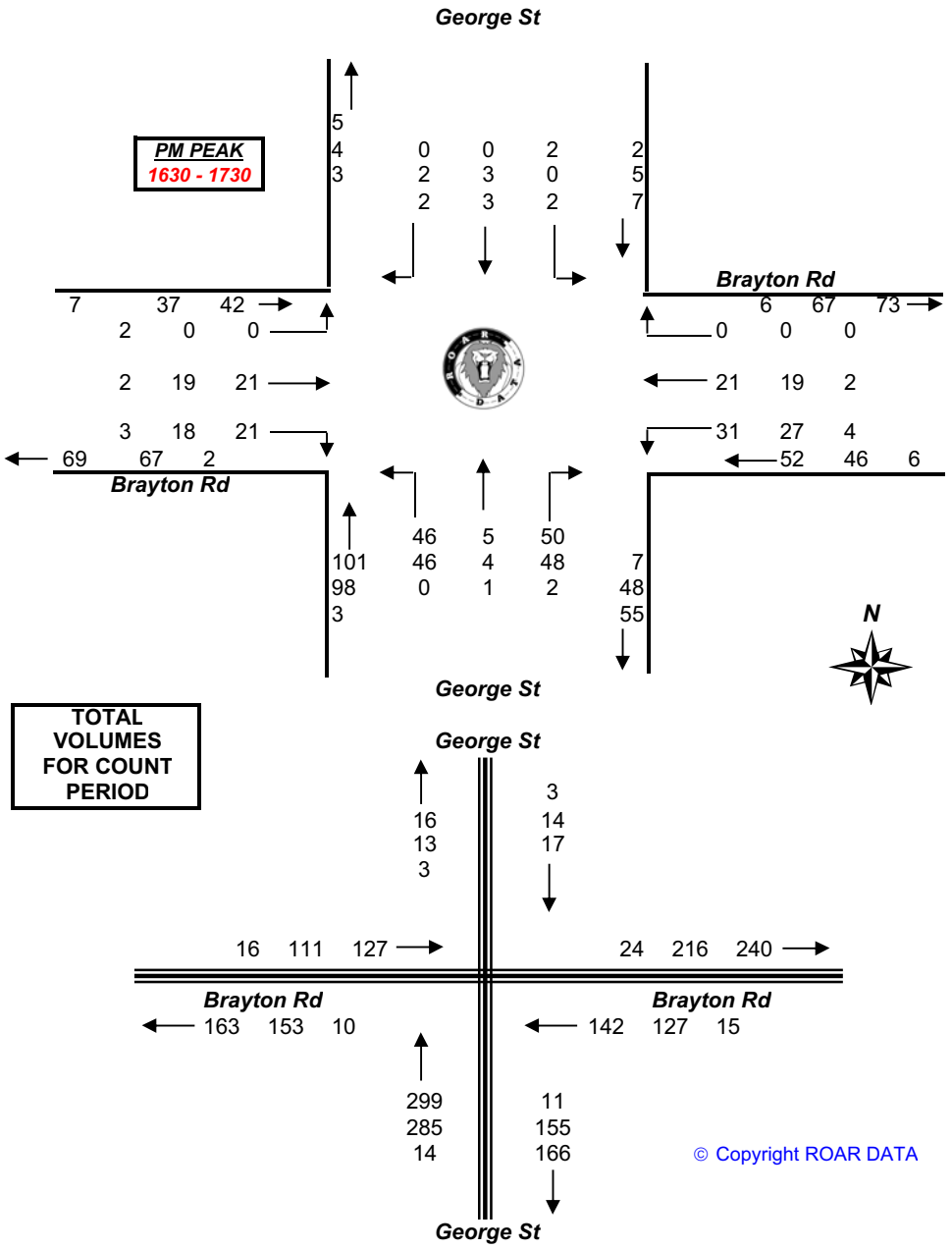
Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

Peds	NORTH	WEST	SOUTH	EAST	
	George St	*Brayton Rd*	*George St*	*Brayton Rd*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1430 - 1445					0
1445 - 1500					0
1500 - 1515					0
1515 - 1530					0
1530 - 1545		NOT	NOT		0
1545 - 1600		REQUIRED	REQUIRED		0
1600 - 1615					0
1615 - 1630					0
1630 - 1645					0
1645 - 1700					0
1700 - 1715					0
1715 - 1730					0
Period End	0	0	0	0	0

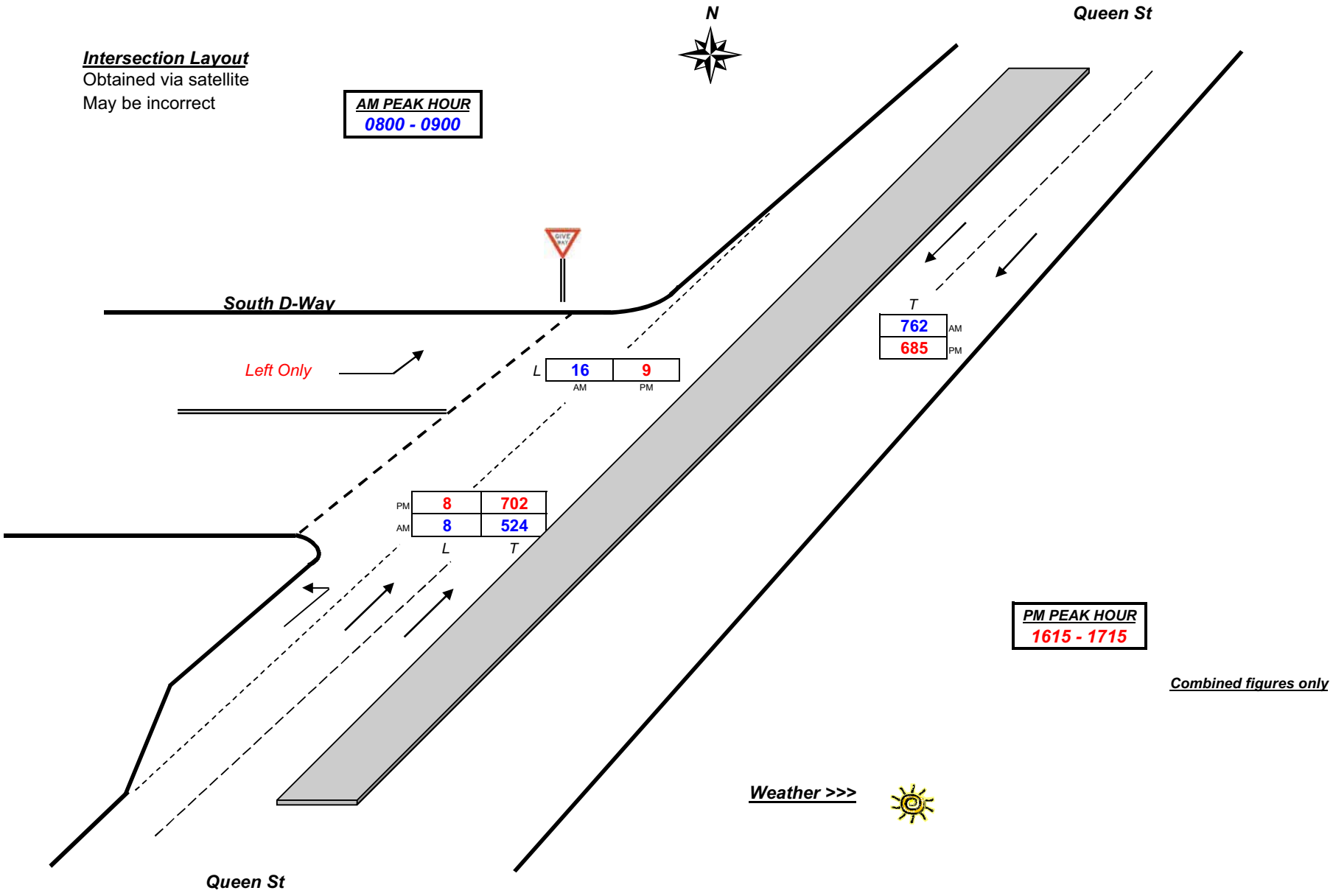
Peds	NORTH	WEST	SOUTH	EAST	
	George St	*Brayton Rd*	*George St*	*Brayton Rd*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1430 - 1530	0	0	0	0	0
1445 - 1545	0	0	0	0	0
1500 - 1600	0	0	0	0	0
1515 - 1615	0	0	0	0	0
1530 - 1630	0	0	0	0	0
1545 - 1645	0	0	0	0	0
1600 - 1700	0	0	0	0	0
1615 - 1715	0	0	0	0	0
1630 - 1730	0	0	0	0	0
PEAK HR	0	0	0	0	0



R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

Intersection Layout
Obtained via satellite
May be incorrect



AM PEAK HOUR
0800 - 0900

PM PEAK HOUR
1615 - 1715

Combined figures only

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.
Mobile.0418239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Hume Hwy	Red Hills Rd	Hume Hwy	TOT
0600 - 0615				0
0615 - 0630				0
0630 - 0645				0
0645 - 0700		NOT		0
0700 - 0715		REQUIRED		0
0715 - 0730				0
0730 - 0745				0
0745 - 0800				0
0800 - 0815				0
0815 - 0830				0
0830 - 0845				0
0845 - 0900				0
Per End	0	0	0	0

PEDS	NORTH	WEST	SOUTH	
Peak Per	Hume Hwy	Red Hills Rd	Hume Hwy	TOT
0600 - 0700	0	0	0	0
0615 - 0715	0	0	0	0
0630 - 0730	0	0	0	0
0645 - 0745	0	0	0	0
0700 - 0800	0	0	0	0
0715 - 0815	0	0	0	0
0730 - 0830	0	0	0	0
0745 - 0845	0	0	0	0
0800 - 0900	0	0	0	0
PEAK HR	0	0	0	0

Lights	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
0600 - 0615	42		0		0	35	77
0615 - 0630	59		0		0	42	101
0630 - 0645	97		4		1	75	177
0645 - 0700	131		2		3	80	216
0700 - 0715	129		3		5	77	214
0715 - 0730	135		5		4	83	227
0730 - 0745	130		4		4	81	219
0745 - 0800	143		1		1	79	224
0800 - 0815	178		2		2	95	277
0815 - 0830	165		2		0	100	267
0830 - 0845	171		0		1	111	283
0845 - 0900	161		1		0	95	257
Per End	1541	0	24	0	21	953	2539

Heavies	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
0600 - 0615	21		2		0	25	48
0615 - 0630	22		3		1	20	46
0630 - 0645	19		2		2	25	48
0645 - 0700	20		2		4	24	50
0700 - 0715	24		4		3	26	57
0715 - 0730	22		3		4	28	57
0730 - 0745	24		6		5	25	60
0745 - 0800	23		2		3	35	63
0800 - 0815	25		3		4	32	64
0815 - 0830	25		4		0	23	52
0830 - 0845	19		2		0	33	54
0845 - 0900	18		2		1	35	56
Per End	262	0	35	0	27	331	655

Combined	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
0600 - 0615	63	0	2	0	0	60	125
0615 - 0630	81	0	3	0	1	62	147
0630 - 0645	116	0	6	0	3	100	225
0645 - 0700	151	0	4	0	7	104	266
0700 - 0715	153	0	7	0	8	103	271
0715 - 0730	157	0	8	0	8	111	284
0730 - 0745	154	0	10	0	9	106	279
0745 - 0800	166	0	3	0	4	114	287
0800 - 0815	203	0	5	0	6	127	341
0815 - 0830	190	0	6	0	0	123	319
0830 - 0845	190	0	2	0	1	144	337
0845 - 0900	179	0	3	0	1	130	313
Per End	1803	0	59	0	48	1284	3194

Lights	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
0600 - 0700	329	0	6	0	4	232	571
0615 - 0715	416	0	9	0	9	274	708
0630 - 0730	492	0	14	0	13	315	834
0645 - 0745	525	0	14	0	16	321	876
0700 - 0800	537	0	13	0	14	320	884
0715 - 0815	586	0	12	0	11	338	947
0730 - 0830	616	0	9	0	7	355	987
0745 - 0845	657	0	5	0	4	385	1051
0800 - 0900	675	0	5	0	3	401	1084
PEAK HR	675	0	5	0	3	401	1084

Heavies	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
0600 - 0700	82	0	9	0	7	94	192
0615 - 0715	85	0	11	0	10	95	201
0630 - 0730	85	0	11	0	13	103	212
0645 - 0745	90	0	15	0	16	103	224
0700 - 0800	93	0	15	0	15	114	237
0715 - 0815	94	0	14	0	16	120	244
0730 - 0830	97	0	15	0	12	115	239
0745 - 0845	92	0	11	0	7	123	233
0800 - 0900	87	0	11	0	5	123	226
PEAK HR	87	0	11	0	5	123	226

Combined	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
0600 - 0700	411	0	15	0	11	326	763
0615 - 0715	501	0	20	0	19	369	909
0630 - 0730	577	0	25	0	26	418	1046
0645 - 0745	615	0	29	0	32	424	1100
0700 - 0800	630	0	28	0	29	434	1121
0715 - 0815	680	0	26	0	27	458	1191
0730 - 0830	713	0	24	0	19	470	1226
0745 - 0845	749	0	16	0	11	508	1284
0800 - 0900	762	0	16	0	8	524	1310
PEAK HR	762	0	16	0	8	524	1310

R.O.A.R. DATA
Reliable, Original & Authentic Results
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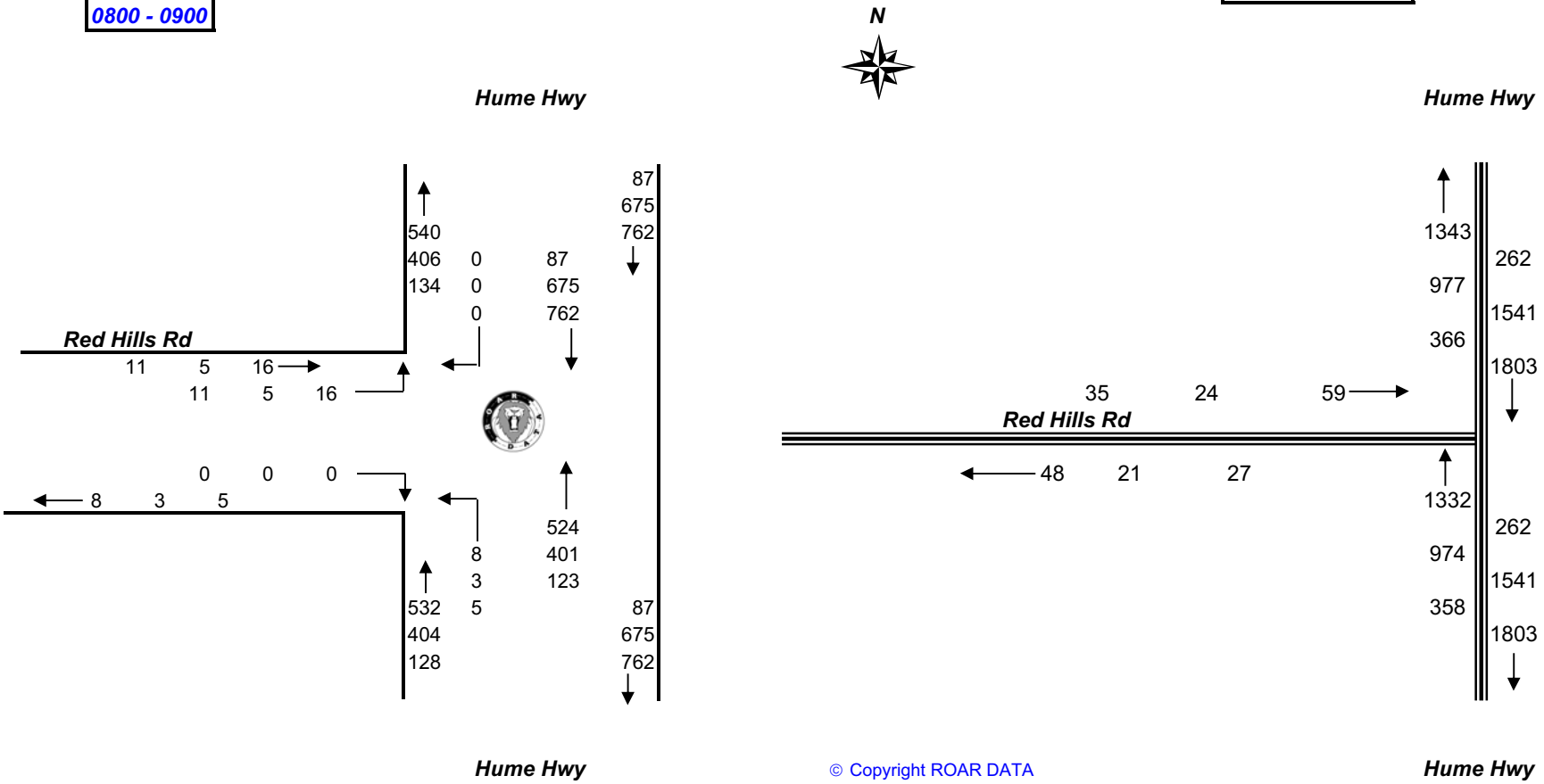
Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

AM PEAK
0800 - 0900

TOTAL VOLUMES FOR COUNT PERIOD



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.
Mobile.0418239019

Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Hume Hwy	Red Hills Rd	Hume Hwy	TOT
1430 - 1445				0
1445 - 1500				0
1500 - 1515				0
1515 - 1530		NOT		0
1530 - 1545		REQUIRED		0
1545 - 1600				0
1600 - 1615				0
1615 - 1630				0
1630 - 1645				0
1645 - 1700				0
1700 - 1715				0
1715 - 1730				0
Per End	**0**	**0**	**0**	**0**

PEDS	NORTH	WEST	SOUTH	
Peak Per	Hume Hwy	Red Hills Rd	Hume Hwy	TOT
1430 - 1530	0	0	0	0
1445 - 1545	0	0	0	0
1500 - 1600	0	0	0	0
1515 - 1615	0	0	0	0
1530 - 1630	0	0	0	0
1545 - 1645	0	0	0	0
1600 - 1700	0	0	0	0
1615 - 1715	0	0	0	0
1630 - 1730	0	0	0	0
PEAK HR	**0**	**0**	**0**	**0**

Lights	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	131		0		0	142	**273**
1445 - 1500	108		1		1	149	**259**
1500 - 1515	134		0		2	160	**296**
1515 - 1530	106		0		2	146	**254**
1530 - 1545	157		2		1	171	**331**
1545 - 1600	133		1		1	143	**278**
1600 - 1615	115		1		0	146	**262**
1615 - 1630	125		1		5	153	**284**
1630 - 1645	139		1		0	149	**289**
1645 - 1700	167		1		0	147	**315**
1700 - 1715	106		2		2	172	**282**
1715 - 1730	118		2		1	155	**276**
Per End	**1539**	**0**	**12**	**0**	**15**	**1833**	**3399**

Heavies	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	37		4		6	21	**68**
1445 - 1500	25		5		5	16	**51**
1500 - 1515	38		0		0	30	**68**
1515 - 1530	38		2		5	17	**62**
1530 - 1545	35		1		3	13	**52**
1545 - 1600	37		4		0	15	**56**
1600 - 1615	40		2		3	23	**68**
1615 - 1630	46		2		0	23	**71**
1630 - 1645	33		1		0	16	**50**
1645 - 1700	39		1		0	24	**64**
1700 - 1715	30		0		1	18	**49**
1715 - 1730	31		0		0	12	**43**
Per End	**429**	**0**	**22**	**0**	**23**	**228**	**702**

Combined	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	168	0	4	0	6	163	**341**
1445 - 1500	133	0	6	0	6	165	**310**
1500 - 1515	172	0	0	0	2	190	**364**
1515 - 1530	144	0	2	0	7	163	**316**
1530 - 1545	192	0	3	0	4	184	**383**
1545 - 1600	170	0	5	0	1	158	**334**
1600 - 1615	155	0	3	0	3	169	**330**
1615 - 1630	171	0	3	0	5	176	**355**
1630 - 1645	172	0	2	0	0	165	**339**
1645 - 1700	206	0	2	0	0	171	**379**
1700 - 1715	136	0	2	0	3	190	**331**
1715 - 1730	149	0	2	0	1	167	**319**
Per End	**1968**	**0**	**34**	**0**	**38**	**2061**	**4101**

Lights	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	479	0	1	0	5	597	**1082**
1445 - 1545	505	0	3	0	6	626	**1140**
1500 - 1600	530	0	3	0	6	620	**1159**
1515 - 1615	511	0	4	0	4	606	**1125**
1530 - 1630	530	0	5	0	7	613	**1155**
1545 - 1645	512	0	4	0	6	591	**1113**
1600 - 1700	546	0	4	0	5	595	**1150**
1615 - 1715	537	0	5	0	7	621	**1170**
1630 - 1730	530	0	6	0	3	623	**1162**
PEAK HR	**537**	**0**	**5**	**0**	**7**	**621**	**1170**

Heavies	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	138	0	11	0	16	84	**249**
1445 - 1545	136	0	8	0	13	76	**233**
1500 - 1600	148	0	7	0	8	75	**238**
1515 - 1615	150	0	9	0	11	68	**238**
1530 - 1630	158	0	9	0	6	74	**247**
1545 - 1645	156	0	9	0	3	77	**245**
1600 - 1700	158	0	6	0	3	86	**253**
1615 - 1715	148	0	4	0	1	81	**234**
1630 - 1730	133	0	2	0	1	70	**206**
PEAK HR	**148**	**0**	**4**	**0**	**1**	**81**	**234**

Combined	NORTH		WEST		SOUTH		
	Hume Hwy		Red Hills Rd		Hume Hwy		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	617	0	12	0	21	681	**1331**
1445 - 1545	641	0	11	0	19	702	**1373**
1500 - 1600	678	0	10	0	14	695	**1397**
1515 - 1615	661	0	13	0	15	674	**1363**
1530 - 1630	688	0	14	0	13	687	**1402**
1545 - 1645	668	0	13	0	9	668	**1358**
1600 - 1700	704	0	10	0	8	681	**1403**
1615 - 1715	685	0	9	0	8	702	**1404**
1630 - 1730	663	0	8	0	4	693	**1368**
PEAK HR	**685**	**0**	**9**	**0**	**8**	**702**	**1404**

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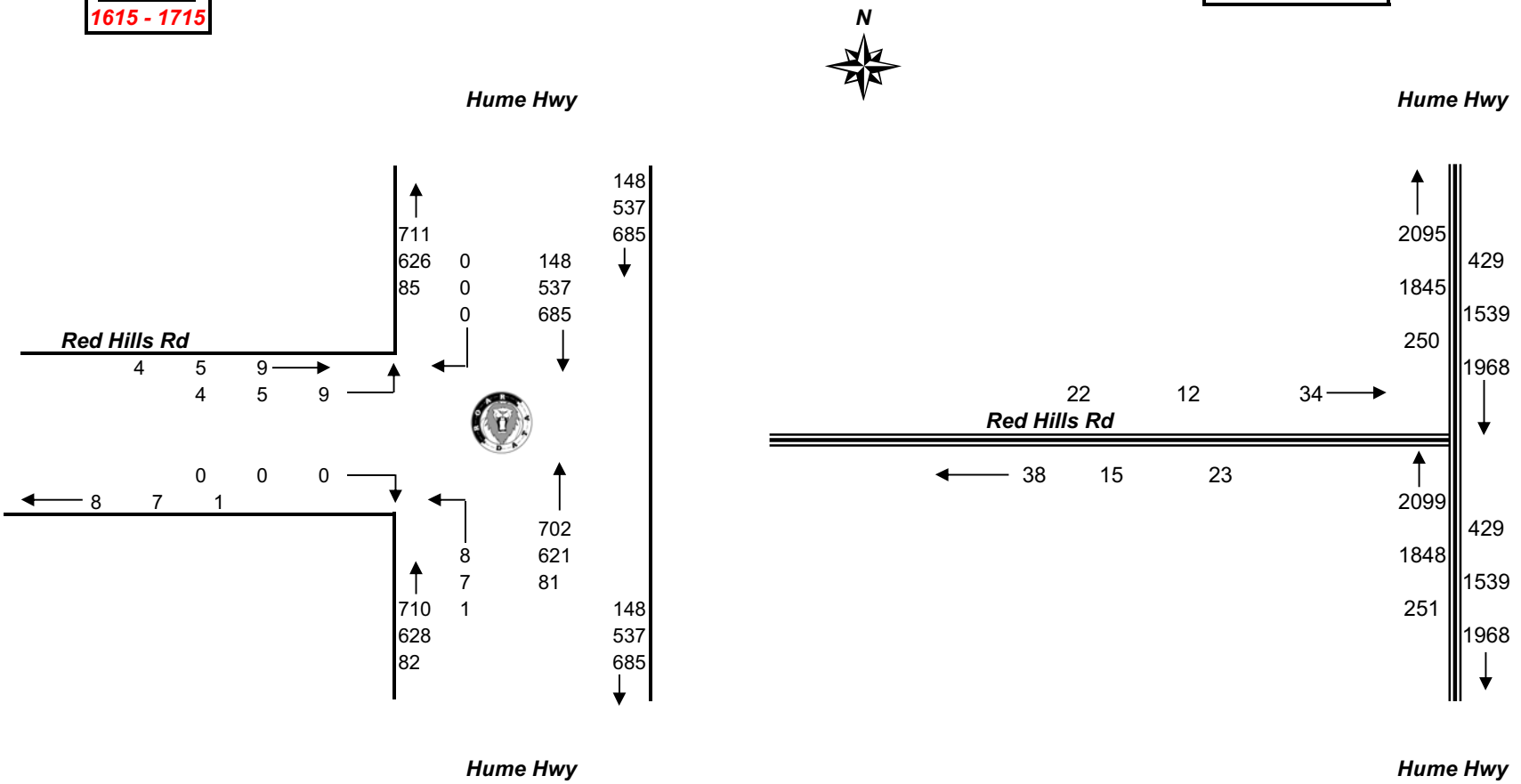
Client : EMGA
Job No/Name : 5732 MARULAN Intersection Counts
Day/Date : Tuesday / 18th August 2015

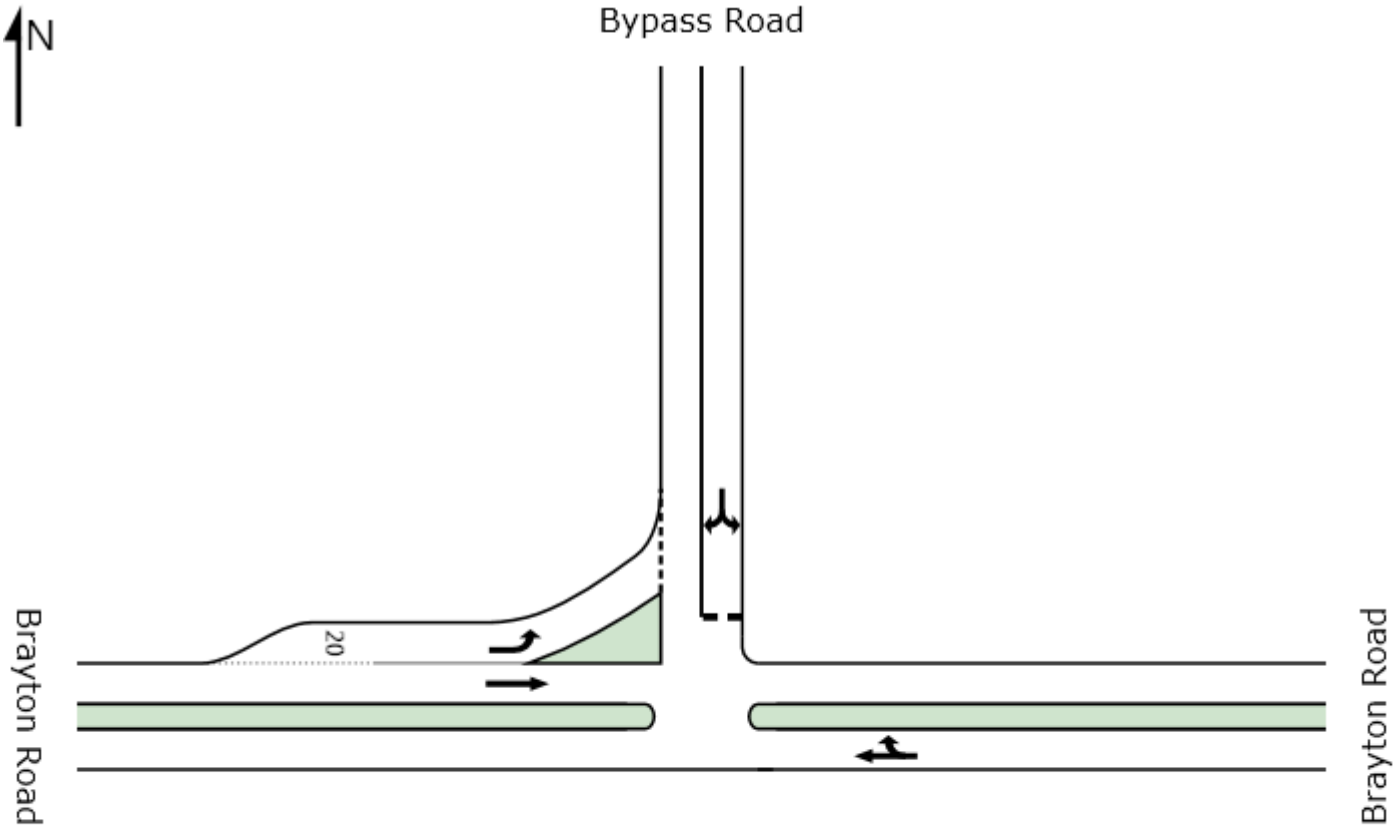
PM PEAK
1615 - 1715

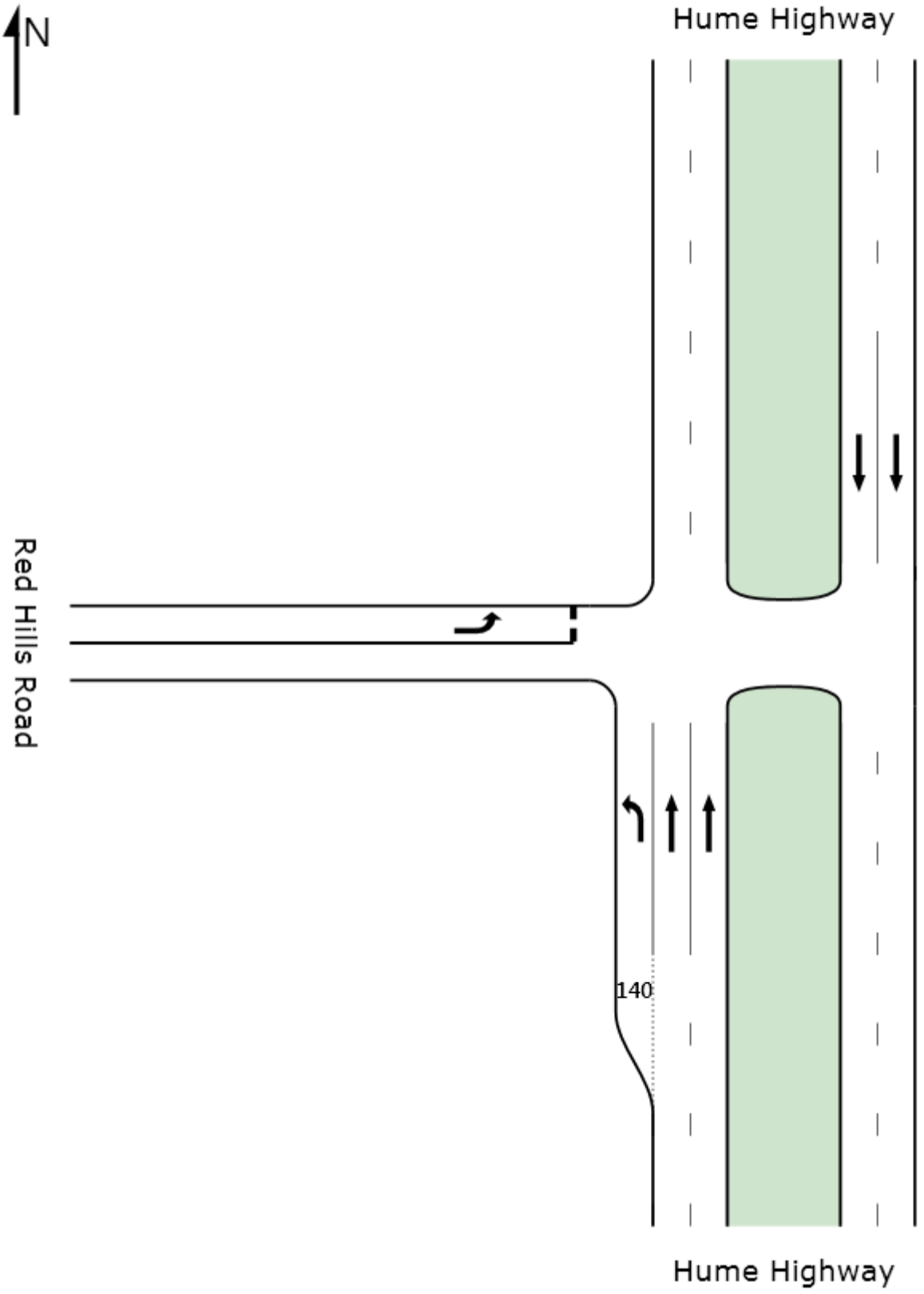
TOTAL VOLUMES FOR COUNT PERIOD

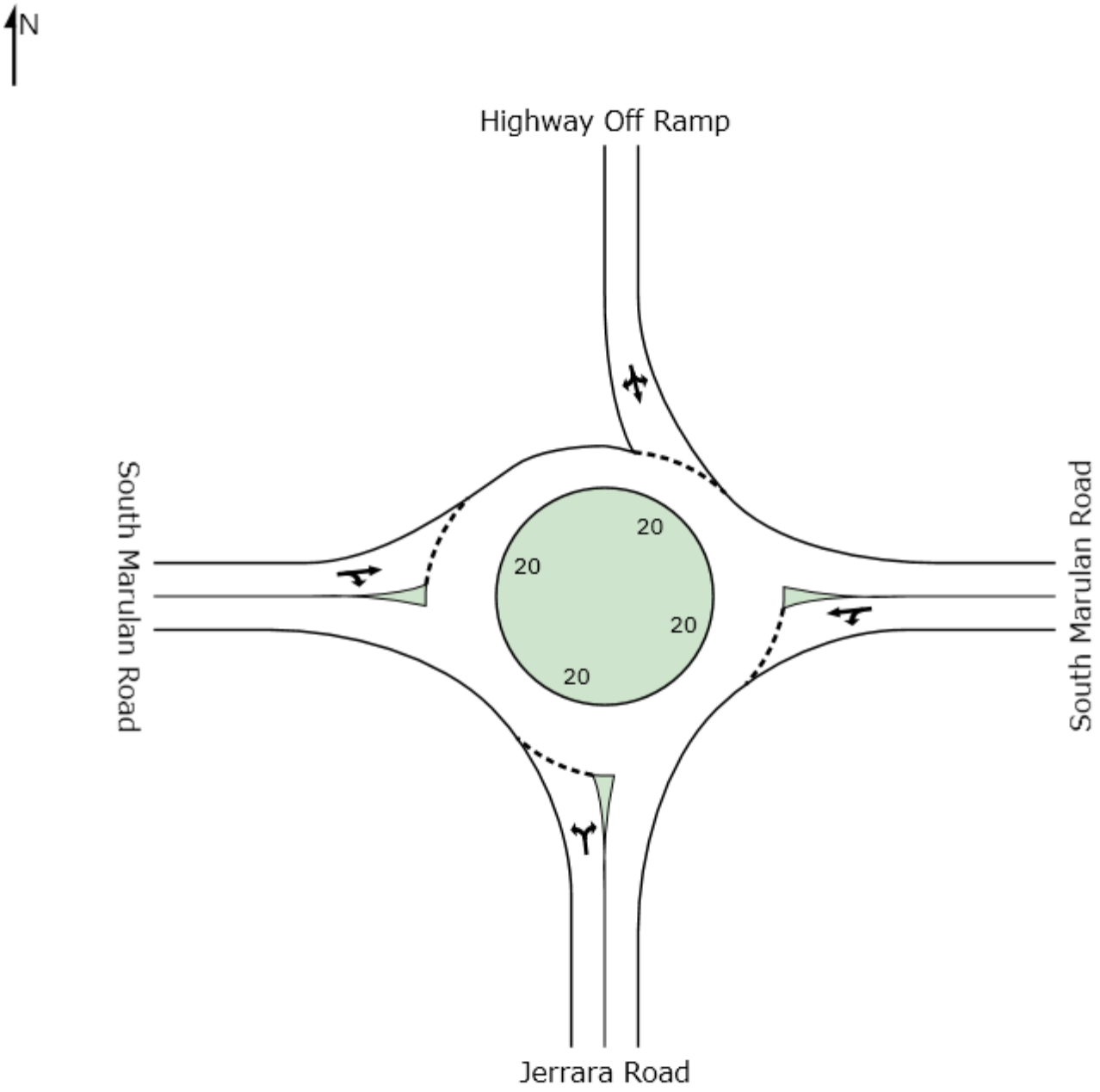


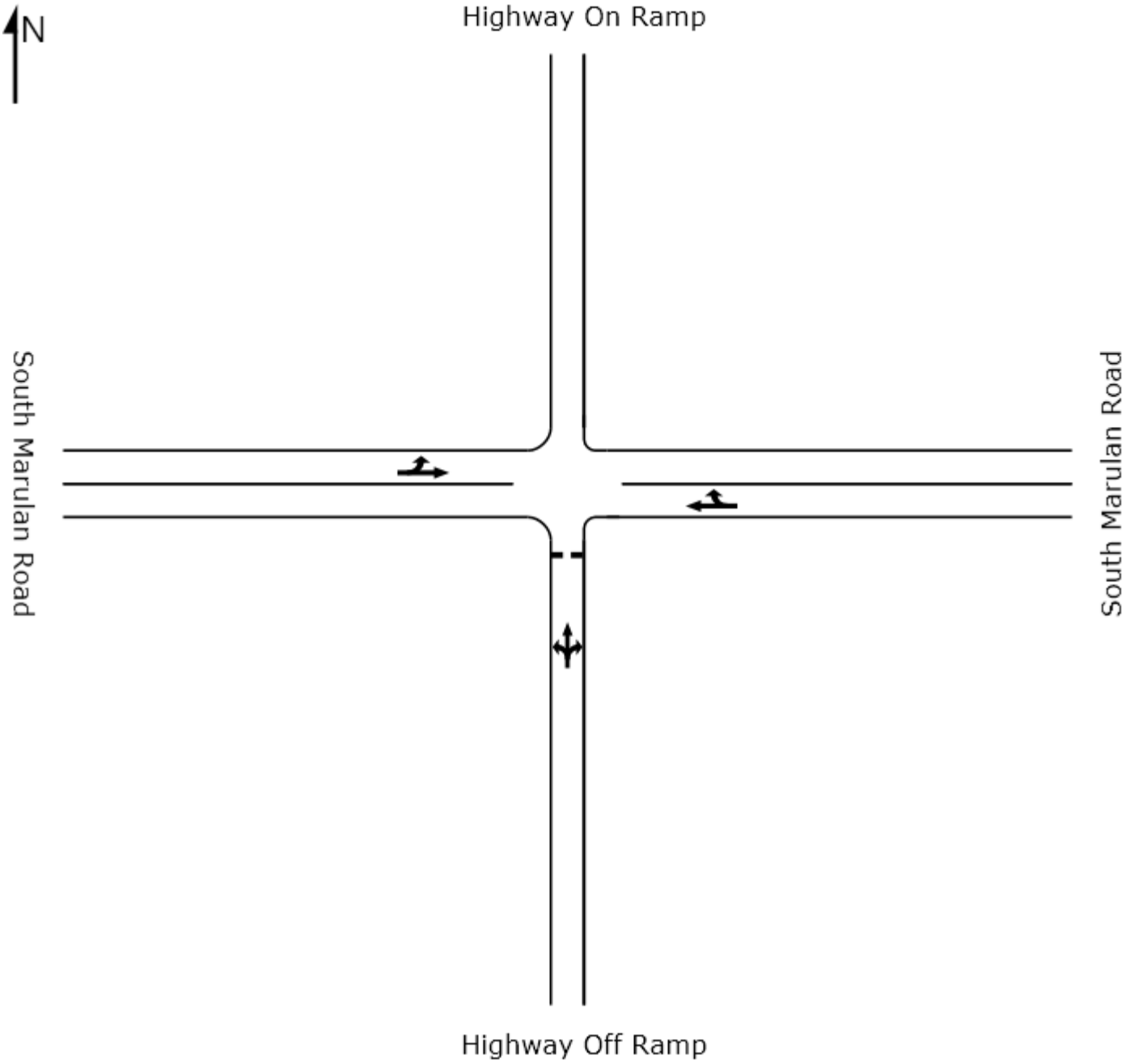
Appendix E

SIDRA Intersection Analysis Results


N
Bypass Road
Brayton Road
Brayton Road
20


N
Hume Highway
Red Hills Road
140
Hume Highway


N
Highway Off Ramp
South Marulan Road
South Marulan Road
20
20
20
20
Jerrara Road


N
Highway On Ramp
South Marulan Road
South Marulan Road
Highway Off Ramp

MOVEMENT SUMMARY

Site: 2015 Brayton Road Bypass Road AM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	21	50.0	0.015	0.1	LOS A	0.1	0.6	0.09	0.00	76.7
6	R	1	0.0	0.015	10.9	LOS A	0.1	0.6	0.09	1.26	59.4
Approach		22	47.6	0.015	0.6	NA	0.1	0.6	0.09	0.06	75.7
North: Bypass Road											
7	L	2	0.0	0.023	12.4	LOS A	0.1	1.0	0.24	0.62	56.8
9	R	9	77.8	0.023	17.2	LOS B	0.1	1.0	0.24	0.69	56.8
Approach		12	63.6	0.023	16.3	LOS B	0.1	1.0	0.24	0.68	56.8
West: Brayton Road											
10	L	14	84.6	0.033	15.2	LOS B	0.1	0.8	0.15	0.59	57.9
11	T	18	52.9	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		32	66.7	0.033	6.6	NA	0.1	0.8	0.06	0.26	68.7
All Vehicles		65	59.7	0.033	6.3	NA	0.1	1.0	0.10	0.26	68.3

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 used.

MOVEMENT SUMMARY

Site: 2015 Brayton Road Bypass Road PM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	24	34.8	0.017	0.1	LOS A	0.1	0.7	0.09	0.00	76.6
6	R	2	0.0	0.017	10.9	LOS A	0.1	0.7	0.09	1.22	59.4
Approach		26	32.0	0.017	0.9	NA	0.1	0.7	0.09	0.10	74.9
North: Bypass Road											
7	L	6	0.0	0.014	11.4	LOS A	0.1	0.4	0.14	0.66	58.1
9	R	5	40.0	0.014	13.9	LOS A	0.1	0.4	0.14	0.70	58.1
Approach		12	18.2	0.014	12.5	LOS A	0.1	0.4	0.14	0.68	58.1
West: Brayton Road											
10	L	7	71.4	0.016	14.5	LOS A	0.0	0.4	0.05	0.65	58.5
11	T	19	38.9	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		26	48.0	0.016	4.1	NA	0.0	0.4	0.01	0.18	72.6
All Vehicles		64	36.1	0.017	4.3	NA	0.1	0.7	0.07	0.24	70.4

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 used.

MOVEMENT SUMMARY

Site: 2015 Hume Highway Red Hills Road AM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	8	62.5	0.007	16.1	LOS B	0.0	0.0	0.00	0.76	63.3
2	T	552	23.5	0.163	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		560	24.1	0.163	0.2	NA	0.0	0.0	0.00	0.01	99.3
North: Hume Highway											
8	T	802	11.4	0.221	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		802	11.4	0.221	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	17	68.8	0.078	27.2	LOS B	0.3	2.9	0.72	0.92	43.1
Approach		17	68.8	0.078	27.2	LOS B	0.3	2.9	0.72	0.92	43.1
All Vehicles		1379	17.3	0.221	0.4	NA	0.3	2.9	0.01	0.02	98.2

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 used.

MOVEMENT SUMMARY

Site: 2015 Hume Highway Red Hills Road PM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	9	22.2	0.006	13.8	LOS A	0.0	0.0	0.00	0.76	63.3
2	T	739	11.5	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		748	11.7	0.204	0.2	NA	0.0	0.0	0.00	0.01	99.4
North: Hume Highway											
8	T	721	21.6	0.211	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		721	21.6	0.211	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	9	44.4	0.040	24.2	LOS B	0.1	1.2	0.73	0.92	44.3
Approach		9	44.4	0.040	24.2	LOS B	0.1	1.2	0.73	0.92	44.3
All Vehicles		1479	16.7	0.211	0.2	NA	0.1	1.2	0.00	0.01	98.9

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 used.

MOVEMENT SUMMARY

Site: 2015 South Marulan Road
East Side AM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	18	0.0	0.014	6.4	LOS A	0.1	0.4	0.15	0.50	50.2
3	R	1	0.0	0.014	11.3	LOS A	0.1	0.4	0.15	0.75	46.2
Approach		19	0.0	0.014	6.7	LOS A	0.1	0.4	0.15	0.51	50.0
East: South Marulan Road											
4	L	7	42.9	0.026	7.9	LOS A	0.1	1.1	0.15	0.54	50.4
5	T	20	31.6	0.026	6.5	LOS A	0.1	1.1	0.15	0.44	51.2
Approach		27	34.6	0.026	6.9	LOS A	0.1	1.1	0.15	0.46	51.0
North: Highway Off Ramp											
7	L	9	44.4	0.032	7.9	LOS A	0.1	1.3	0.11	0.50	50.5
8	T	9	0.0	0.032	5.5	LOS A	0.1	1.3	0.11	0.41	51.4
9	R	14	61.5	0.032	13.1	LOS A	0.1	1.3	0.11	0.74	46.3
Approach		33	38.7	0.032	9.4	LOS A	0.1	1.3	0.11	0.57	48.8
West: South Marulan Road											
11	T	13	25.0	0.012	6.1	LOS A	0.1	0.5	0.02	0.45	52.2
12	R	3	33.3	0.012	12.1	LOS A	0.1	0.5	0.02	0.87	46.5
Approach		16	26.7	0.012	7.3	LOS A	0.1	0.5	0.02	0.53	50.9
All Vehicles		95	27.8	0.032	7.8	LOS A	0.1	1.3	0.11	0.52	50.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2015 South Marulan Road
East Side PM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	17	6.3	0.013	6.5	LOS A	0.1	0.4	0.10	0.50	50.6
3	R	1	0.0	0.013	11.2	LOS A	0.1	0.4	0.10	0.77	46.3
Approach		18	5.9	0.013	6.8	LOS A	0.1	0.4	0.10	0.52	50.3
East: South Marulan Road											
4	L	14	0.0	0.024	6.5	LOS A	0.1	0.8	0.18	0.52	50.1
5	T	18	5.9	0.024	5.8	LOS A	0.1	0.8	0.18	0.44	50.9
Approach		32	3.3	0.024	6.1	LOS A	0.1	0.8	0.18	0.47	50.6
North: Highway Off Ramp											
7	L	6	33.3	0.023	7.6	LOS A	0.1	0.8	0.16	0.53	50.3
8	T	19	0.0	0.023	5.6	LOS A	0.1	0.8	0.16	0.43	51.1
9	R	2	100.0	0.023	14.4	LOS A	0.1	0.8	0.16	0.80	44.8
Approach		27	15.4	0.023	6.8	LOS A	0.1	0.8	0.16	0.48	50.3
West: South Marulan Road											
11	T	6	0.0	0.029	5.4	LOS A	0.1	1.0	0.01	0.41	52.2
12	R	43	0.0	0.029	11.1	LOS A	0.1	1.0	0.01	0.73	46.5
Approach		49	0.0	0.029	10.4	LOS A	0.1	1.0	0.01	0.69	47.1
All Vehicles		126	5.0	0.029	8.0	LOS A	0.1	1.0	0.10	0.57	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2015 South Marulan Road
West Side AM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	3	0.0	0.021	8.8	LOS A	0.1	0.7	0.11	0.58	48.2
2	T	1	0.0	0.021	7.6	LOS A	0.1	0.7	0.11	0.52	49.5
3	R	12	27.3	0.021	10.7	LOS A	0.1	0.7	0.11	0.72	47.4
Approach		16	20.0	0.021	10.1	LOS A	0.1	0.7	0.11	0.68	47.7
East: South Marulan Road											
5	T	11	0.0	0.043	0.0	LOS A	0.2	1.6	0.05	0.00	58.6
6	R	43	29.3	0.043	10.1	LOS A	0.2	1.6	0.05	0.77	48.0
Approach		54	23.5	0.043	8.1	NA	0.2	1.6	0.05	0.62	49.8
West: South Marulan Road											
10	L	7	0.0	0.005	8.2	LOS A	0.0	0.0	0.00	0.70	49.0
11	T	1	0.0	0.005	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		8	0.0	0.005	7.2	NA	0.0	0.0	0.00	0.61	50.1
All Vehicles		78	20.3	0.043	8.4	NA	0.2	1.6	0.06	0.63	49.4

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 used.

MOVEMENT SUMMARY

Site: 2015 South Marulan Road
West Side PM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	4	0.0	0.034	8.7	LOS A	0.1	1.0	0.06	0.60	48.3
2	T	2	0.0	0.034	7.5	LOS A	0.1	1.0	0.06	0.53	49.7
3	R	22	9.5	0.034	9.8	LOS A	0.1	1.0	0.06	0.73	47.5
Approach		28	7.4	0.034	9.5	LOS A	0.1	1.0	0.06	0.70	47.8
East: South Marulan Road											
5	T	3	0.0	0.027	0.2	LOS A	0.1	0.9	0.14	0.00	56.3
6	R	33	12.9	0.027	9.6	LOS A	0.1	0.9	0.14	0.70	47.7
Approach		36	11.8	0.027	8.8	NA	0.1	0.9	0.14	0.63	48.4
West: South Marulan Road											
10	L	22	0.0	0.027	8.2	LOS A	0.0	0.0	0.00	0.85	49.0
11	T	29	0.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		52	0.0	0.027	3.5	NA	0.0	0.0	0.00	0.36	54.7
All Vehicles		116	5.5	0.034	6.6	NA	0.1	1.0	0.06	0.53	50.9

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project Brayton Road Bypass Road AM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	21	50.0	0.015	0.1	LOS A	0.1	0.6	0.09	0.00	76.7
6	R	1	0.0	0.015	10.9	LOS A	0.1	0.6	0.09	1.26	59.4
Approach		22	47.6	0.015	0.6	NA	0.1	0.6	0.09	0.06	75.7
North: Bypass Road											
7	L	2	0.0	0.096	14.1	LOS A	0.4	4.7	0.35	0.61	54.7
9	R	35	93.9	0.096	19.8	LOS B	0.4	4.7	0.35	0.72	54.7
Approach		37	88.6	0.096	19.5	LOS B	0.4	4.7	0.35	0.71	54.7
West: Brayton Road											
10	L	39	94.6	0.102	15.9	LOS B	0.2	2.7	0.46	0.41	55.8
11	T	18	52.9	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		57	81.5	0.102	10.9	NA	0.2	2.7	0.32	0.28	61.7
All Vehicles		116	77.3	0.102	11.6	NA	0.4	4.7	0.28	0.37	61.4

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project Brayton Road Bypass Road PM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	24	34.8	0.017	0.1	LOS A	0.1	0.7	0.09	0.00	76.6
6	R	2	0.0	0.017	10.9	LOS A	0.1	0.7	0.09	1.22	59.4
Approach		26	32.0	0.017	0.9	NA	0.1	0.7	0.09	0.10	74.9
North: Bypass Road											
7	L	6	0.0	0.094	13.6	LOS A	0.4	4.3	0.32	0.62	55.3
9	R	34	90.6	0.094	19.1	LOS B	0.4	4.3	0.32	0.72	55.3
Approach		40	76.3	0.094	18.2	LOS B	0.4	4.3	0.32	0.70	55.3
West: Brayton Road											
10	L	36	94.1	0.093	15.8	LOS B	0.2	2.4	0.32	0.50	56.7
11	T	19	38.9	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		55	75.0	0.093	10.3	NA	0.2	2.4	0.21	0.33	63.1
All Vehicles		121	66.1	0.094	10.9	NA	0.4	4.3	0.22	0.40	62.4

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project Hume Highway Red Hills Road AM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	34	90.6	0.030	17.7	LOS B	0.0	0.0	0.00	0.76	63.3
2	T	552	23.5	0.163	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		585	27.3	0.163	1.0	NA	0.0	0.0	0.00	0.04	97.5
North: Hume Highway											
8	T	802	11.4	0.221	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		802	11.4	0.221	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	42	87.5	0.269	38.3	LOS C	1.0	11.9	0.81	0.99	37.4
Approach		42	87.5	0.269	38.3	LOS C	1.0	11.9	0.81	0.99	37.4
All Vehicles		1429	20.2	0.269	1.5	NA	1.0	11.9	0.02	0.05	94.4

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project Hume Highway Red Hills Road PM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	38	80.6	0.032	17.1	LOS B	0.0	0.0	0.00	0.76	63.3
2	T	739	11.5	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		777	14.9	0.204	0.8	NA	0.0	0.0	0.00	0.04	97.9
North: Hume Highway											
8	T	721	21.6	0.211	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		721	21.6	0.211	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	38	86.1	0.332	50.5	LOS D	1.2	14.3	0.88	1.02	32.1
Approach		38	86.1	0.332	50.5	LOS D	1.2	14.3	0.88	1.02	32.1
All Vehicles		1536	19.8	0.332	1.7	NA	1.2	14.3	0.02	0.04	94.2

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project South Marulan Road East Side AM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	18	0.0	0.015	6.6	LOS A	0.1	0.5	0.22	0.50	49.8
3	R	1	0.0	0.015	11.5	LOS A	0.1	0.5	0.22	0.73	46.1
Approach		19	0.0	0.015	6.9	LOS A	0.1	0.5	0.22	0.51	49.5
East: South Marulan Road											
4	L	7	42.9	0.028	8.3	LOS A	0.1	1.2	0.24	0.54	49.9
5	T	20	31.6	0.028	6.8	LOS A	0.1	1.2	0.24	0.45	50.5
Approach		27	34.6	0.028	7.2	LOS A	0.1	1.2	0.24	0.47	50.3
North: Highway Off Ramp											
7	L	9	44.4	0.065	7.9	LOS A	0.3	3.0	0.11	0.48	50.4
8	T	9	0.0	0.065	5.5	LOS A	0.3	3.0	0.11	0.40	51.3
9	R	39	86.5	0.065	13.9	LOS A	0.3	3.0	0.11	0.69	46.2
Approach		58	65.5	0.065	11.6	LOS A	0.3	3.0	0.11	0.61	47.6
West: South Marulan Road											
11	T	13	25.0	0.012	6.1	LOS A	0.1	0.5	0.02	0.45	52.2
12	R	3	33.3	0.012	12.1	LOS A	0.1	0.5	0.02	0.87	46.5
Approach		16	26.7	0.012	7.3	LOS A	0.1	0.5	0.02	0.53	50.9
All Vehicles		120	43.0	0.065	9.3	LOS A	0.3	3.0	0.15	0.55	48.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2015 With Project South Marulan Road East Side PM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	17	6.3	0.014	6.8	LOS A	0.1	0.5	0.20	0.50	49.9
3	R	1	0.0	0.014	11.4	LOS A	0.1	0.5	0.20	0.74	46.1
Approach		18	5.9	0.014	7.1	LOS A	0.1	0.5	0.20	0.51	49.7
East: South Marulan Road											
4	L	14	0.0	0.025	6.8	LOS A	0.1	0.8	0.26	0.53	49.7
5	T	18	5.9	0.025	6.0	LOS A	0.1	0.8	0.26	0.45	50.3
Approach		32	3.3	0.025	6.3	LOS A	0.1	0.8	0.26	0.48	50.1
North: Highway Off Ramp											
7	L	6	33.3	0.065	7.8	LOS A	0.3	2.7	0.17	0.50	50.0
8	T	19	0.0	0.065	5.8	LOS A	0.3	2.7	0.17	0.41	50.8
9	R	31	100.0	0.065	14.6	LOS B	0.3	2.7	0.17	0.71	44.5
Approach		56	58.5	0.065	10.8	LOS A	0.3	2.7	0.17	0.59	46.9
West: South Marulan Road											
11	T	6	0.0	0.029	5.4	LOS A	0.1	1.0	0.01	0.41	52.2
12	R	43	0.0	0.029	11.1	LOS A	0.1	1.0	0.01	0.73	46.5
Approach		49	0.0	0.029	10.4	LOS A	0.1	1.0	0.01	0.69	47.1
All Vehicles		155	22.4	0.065	9.3	LOS A	0.3	2.7	0.14	0.59	47.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2015 With Project South Marulan Road West Side AM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	3	0.0	0.023	9.4	LOS A	0.1	0.7	0.12	0.58	47.6
2	T	1	0.0	0.023	8.1	LOS A	0.1	0.7	0.12	0.53	48.9
3	R	12	27.3	0.023	11.2	LOS A	0.1	0.7	0.12	0.73	46.9
Approach		16	20.0	0.023	10.6	LOS A	0.1	0.7	0.12	0.68	47.2
East: South Marulan Road											
5	T	11	0.0	0.078	0.1	LOS A	0.3	3.5	0.06	0.00	58.4
6	R	68	55.4	0.078	11.1	LOS A	0.3	3.5	0.06	0.75	48.0
Approach		79	48.0	0.078	9.7	NA	0.3	3.5	0.06	0.65	49.2
West: South Marulan Road											
10	L	7	0.0	0.005	8.2	LOS A	0.0	0.0	0.00	0.70	49.0
11	T	1	0.0	0.005	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		8	0.0	0.005	7.2	NA	0.0	0.0	0.00	0.61	50.1
All Vehicles		103	39.8	0.078	9.6	NA	0.3	3.5	0.06	0.65	48.9

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 used.

MOVEMENT SUMMARY

Site: 2015 With Project South Marulan Road West Side PM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	4	0.0	0.037	9.2	LOS A	0.1	1.0	0.05	0.61	47.8
2	T	2	0.0	0.037	7.9	LOS A	0.1	1.0	0.05	0.53	49.1
3	R	22	9.5	0.037	10.3	LOS A	0.1	1.0	0.05	0.74	47.0
Approach		28	7.4	0.037	10.0	LOS A	0.1	1.0	0.05	0.70	47.3
East: South Marulan Road											
5	T	3	0.0	0.069	0.4	LOS A	0.3	2.9	0.18	0.00	55.4
6	R	61	53.4	0.069	11.4	LOS A	0.3	2.9	0.18	0.69	47.6
Approach		64	50.8	0.069	10.9	NA	0.3	2.9	0.18	0.65	47.9
West: South Marulan Road											
10	L	22	0.0	0.027	8.2	LOS A	0.0	0.0	0.00	0.85	49.0
11	T	29	0.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		52	0.0	0.027	3.5	NA	0.0	0.0	0.00	0.36	54.7
All Vehicles		144	24.1	0.069	8.1	NA	0.3	2.9	0.09	0.56	50.0

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 used.

MOVEMENT SUMMARY

Site: 2025 Brayton Road Bypass Road AM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	20	57.9	0.015	0.1	LOS A	0.1	0.6	0.10	0.00	76.4
6	R	1	0.0	0.015	10.9	LOS A	0.1	0.6	0.10	1.25	59.4
Approach		21	55.0	0.015	0.6	NA	0.1	0.6	0.10	0.06	75.4
North: Bypass Road											
7	L	2	0.0	0.011	12.1	LOS A	0.0	0.4	0.21	0.63	57.2
9	R	4	75.0	0.011	16.7	LOS B	0.0	0.4	0.21	0.69	57.3
Approach		6	50.0	0.011	15.2	LOS B	0.0	0.4	0.21	0.67	57.2
West: Brayton Road											
10	L	11	80.0	0.025	14.9	LOS B	0.1	0.6	0.11	0.62	58.1
11	T	21	50.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		32	60.0	0.025	5.0	NA	0.1	0.6	0.04	0.21	71.1
All Vehicles		59	57.1	0.025	4.5	NA	0.1	0.6	0.08	0.20	70.8

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 used.

MOVEMENT SUMMARY

Site: 2025 Brayton Road Bypass Road PM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	24	21.7	0.016	0.1	LOS A	0.1	0.6	0.09	0.00	76.7
6	R	2	0.0	0.016	10.9	LOS A	0.1	0.6	0.09	1.22	59.4
Approach		26	20.0	0.016	0.9	NA	0.1	0.6	0.09	0.10	75.0
North: Bypass Road											
7	L	7	0.0	0.014	11.2	LOS A	0.0	0.4	0.11	0.67	58.3
9	R	5	20.0	0.014	12.4	LOS A	0.0	0.4	0.11	0.70	58.3
Approach		13	8.3	0.014	11.7	LOS A	0.0	0.4	0.11	0.68	58.3
West: Brayton Road											
10	L	2	50.0	0.004	13.4	LOS A	0.0	0.1	0.02	0.67	58.7
11	T	17	43.8	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		19	44.4	0.011	1.5	NA	0.0	0.1	0.00	0.07	76.9
All Vehicles		58	25.5	0.016	3.5	NA	0.1	0.6	0.06	0.22	71.2

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 used.

MOVEMENT SUMMARY

Site: 2025 Hume Highway Red Hills Road AM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	4	25.0	0.003	14.0	LOS A	0.0	0.0	0.00	0.76	63.3
2	T	667	24.1	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		672	24.1	0.198	0.1	NA	0.0	0.0	0.00	0.00	99.7
North: Hume Highway											
8	T	962	11.4	0.265	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		962	11.4	0.265	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	15	57.1	0.077	28.9	LOS C	0.2	2.6	0.77	0.93	41.6
Approach		15	57.1	0.077	28.9	LOS C	0.2	2.6	0.77	0.93	41.6
All Vehicles		1648	17.0	0.265	0.3	NA	0.2	2.6	0.01	0.01	98.7

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 used.

MOVEMENT SUMMARY

Site: 2025 Hume Highway Red Hills Road PM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	8	0.0	0.005	12.5	LOS A	0.0	0.0	0.00	0.75	63.3
2	T	892	12.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		900	11.9	0.247	0.1	NA	0.0	0.0	0.00	0.01	99.6
North: Hume Highway											
8	T	865	21.7	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		865	21.7	0.253	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	5	0.0	0.013	16.1	LOS B	0.0	0.3	0.68	0.82	48.5
Approach		5	0.0	0.013	16.1	LOS B	0.0	0.3	0.68	0.82	48.5
All Vehicles		1771	16.6	0.253	0.1	NA	0.0	0.3	0.00	0.01	99.5

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 used.

MOVEMENT SUMMARY

Site: 2025 South Marulan Road
East Side AM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	21	0.0	0.017	6.5	LOS A	0.1	0.5	0.17	0.50	50.1
3	R	1	0.0	0.017	11.3	LOS A	0.1	0.5	0.17	0.75	46.2
Approach		22	0.0	0.017	6.7	LOS A	0.1	0.5	0.17	0.51	49.9
East: South Marulan Road											
4	L	9	44.4	0.032	8.1	LOS A	0.1	1.3	0.18	0.54	50.2
5	T	23	31.8	0.032	6.6	LOS A	0.1	1.3	0.18	0.44	51.0
Approach		33	35.5	0.032	7.0	LOS A	0.1	1.3	0.18	0.47	50.7
North: Highway Off Ramp											
7	L	12	45.5	0.042	8.0	LOS A	0.2	1.7	0.13	0.50	50.4
8	T	12	0.0	0.042	5.5	LOS A	0.2	1.7	0.13	0.41	51.2
9	R	21	50.0	0.042	12.8	LOS A	0.2	1.7	0.13	0.73	46.2
Approach		44	35.7	0.042	9.6	LOS A	0.2	1.7	0.13	0.58	48.4
West: South Marulan Road											
11	T	16	26.7	0.016	6.1	LOS A	0.1	0.6	0.02	0.45	52.2
12	R	4	50.0	0.016	12.6	LOS A	0.1	0.6	0.02	0.87	46.5
Approach		20	31.6	0.016	7.5	LOS A	0.1	0.6	0.02	0.53	50.8
All Vehicles		119	28.3	0.042	8.0	LOS A	0.2	1.7	0.13	0.53	49.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2025 South Marulan Road
East Side PM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	20	5.3	0.015	6.5	LOS A	0.1	0.5	0.11	0.50	50.5
3	R	1	0.0	0.015	11.2	LOS A	0.1	0.5	0.11	0.77	46.3
Approach		21	5.0	0.015	6.8	LOS A	0.1	0.5	0.11	0.52	50.3
East: South Marulan Road											
4	L	17	0.0	0.029	6.6	LOS A	0.1	1.0	0.21	0.52	50.0
5	T	21	5.0	0.029	5.8	LOS A	0.1	1.0	0.21	0.44	50.7
Approach		38	2.8	0.029	6.2	LOS A	0.1	1.0	0.21	0.48	50.4
North: Highway Off Ramp											
7	L	7	28.6	0.028	7.5	LOS A	0.1	0.9	0.19	0.53	50.1
8	T	23	0.0	0.028	5.7	LOS A	0.1	0.9	0.19	0.44	50.9
9	R	2	100.0	0.028	14.5	LOS A	0.1	0.9	0.19	0.80	44.8
Approach		33	12.9	0.028	6.7	LOS A	0.1	0.9	0.19	0.48	50.2
West: South Marulan Road											
11	T	9	22.2	0.038	6.0	LOS A	0.2	1.3	0.01	0.40	52.2
12	R	54	2.0	0.038	11.2	LOS A	0.2	1.3	0.01	0.74	46.5
Approach		63	5.0	0.038	10.4	LOS A	0.2	1.3	0.01	0.69	47.2
All Vehicles		155	6.1	0.038	8.1	LOS A	0.2	1.3	0.11	0.57	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2025 South Marulan Road
West Side AM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	6	16.7	0.031	9.6	LOS A	0.1	1.0	0.16	0.58	48.0
2	T	1	0.0	0.031	7.7	LOS A	0.1	1.0	0.16	0.52	49.2
3	R	15	28.6	0.031	10.9	LOS A	0.1	1.0	0.16	0.71	47.3
Approach		22	23.8	0.031	10.4	LOS A	0.1	1.0	0.16	0.66	47.6
East: South Marulan Road											
5	T	22	23.8	0.051	0.1	LOS A	0.2	1.9	0.09	0.00	57.8
6	R	46	20.5	0.051	9.8	LOS A	0.2	1.9	0.09	0.80	48.0
Approach		68	21.5	0.051	6.6	NA	0.2	1.9	0.09	0.54	50.8
West: South Marulan Road											
10	L	14	38.5	0.011	9.6	LOS A	0.0	0.0	0.00	0.71	49.0
11	T	2	50.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		16	40.0	0.011	8.3	NA	0.0	0.0	0.00	0.61	50.2
All Vehicles		106	24.8	0.051	7.7	NA	0.2	1.9	0.09	0.58	50.0

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 used.

MOVEMENT SUMMARY

Site: 2025 South Marulan Road
West Side PM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	6	16.7	0.042	9.5	LOS A	0.2	1.2	0.13	0.58	48.2
2	T	2	0.0	0.042	7.6	LOS A	0.2	1.2	0.13	0.53	49.4
3	R	26	8.0	0.042	9.9	LOS A	0.2	1.2	0.13	0.71	47.4
Approach		35	9.1	0.042	9.7	LOS A	0.2	1.2	0.13	0.68	47.7
East: South Marulan Road											
5	T	9	55.6	0.032	0.3	LOS A	0.1	1.0	0.16	0.00	55.9
6	R	34	0.0	0.032	9.1	LOS A	0.1	1.0	0.16	0.73	47.8
Approach		43	12.2	0.032	7.2	NA	0.1	1.0	0.16	0.57	49.4
West: South Marulan Road											
10	L	32	16.7	0.039	8.8	LOS A	0.0	0.0	0.00	0.85	49.0
11	T	38	2.8	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		69	9.1	0.039	4.0	NA	0.0	0.0	0.00	0.39	54.4
All Vehicles		147	10.0	0.042	6.3	NA	0.2	1.2	0.08	0.51	51.2

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 Brayton Road Bypass Road AM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	18	52.9	0.013	0.1	LOS A	0.1	0.5	0.10	0.00	76.4
6	R	1	0.0	0.013	10.9	LOS A	0.1	0.5	0.10	1.25	59.4
Approach		19	50.0	0.013	0.7	NA	0.1	0.5	0.10	0.07	75.2
North: Bypass Road											
7	L	2	0.0	0.088	14.0	LOS A	0.3	4.3	0.34	0.61	54.8
9	R	32	96.7	0.088	19.9	LOS B	0.3	4.3	0.34	0.72	54.8
Approach		34	90.6	0.088	19.5	LOS B	0.3	4.3	0.34	0.71	54.8
West: Brayton Road											
10	L	36	94.1	0.093	15.8	LOS B	0.2	2.4	0.42	0.43	56.1
11	T	21	50.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		57	77.8	0.093	9.9	NA	0.2	2.4	0.27	0.27	63.1
All Vehicles		109	76.9	0.093	11.3	NA	0.3	4.3	0.26	0.37	62.0

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 Brayton Road Bypass Road PM Peak

T intersection with median islands
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
East: Brayton Road											
5	T	23	18.2	0.015	0.1	LOS A	0.1	0.6	0.08	0.00	76.9
6	R	2	0.0	0.015	10.9	LOS A	0.1	0.6	0.08	1.22	59.4
Approach		25	16.7	0.015	1.0	NA	0.1	0.6	0.08	0.10	75.0
North: Bypass Road											
7	L	7	0.0	0.093	13.1	LOS A	0.4	4.2	0.29	0.62	56.0
9	R	35	87.9	0.093	18.4	LOS B	0.4	4.2	0.29	0.71	56.0
Approach		42	72.5	0.093	17.5	LOS B	0.4	4.2	0.29	0.69	56.0
West: Brayton Road											
10	L	32	96.7	0.084	15.9	LOS B	0.2	2.2	0.29	0.52	56.9
11	T	16	40.0	0.010	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		47	77.8	0.084	10.6	NA	0.2	2.2	0.19	0.35	63.0
All Vehicles		115	62.4	0.093	11.0	NA	0.4	4.2	0.20	0.42	62.4

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 Hume Highway Red Hills Road AM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	34	90.6	0.030	17.7	LOS B	0.0	0.0	0.00	0.76	63.3
2	T	667	24.1	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		701	27.3	0.198	0.8	NA	0.0	0.0	0.00	0.04	97.9
North: Hume Highway											
8	T	962	11.4	0.265	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		962	11.4	0.265	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	40	84.2	0.345	50.2	LOS D	1.2	14.8	0.88	1.02	32.2
Approach		40	84.2	0.345	50.2	LOS D	1.2	14.8	0.88	1.02	32.2
All Vehicles		1703	19.7	0.345	1.5	NA	1.2	14.8	0.02	0.04	94.6

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 Hume Highway Red Hills Road PM Peak

Highway Access Intersection
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Hume Highway											
1	L	39	78.4	0.033	17.0	LOS B	0.0	0.0	0.00	0.76	63.3
2	T	892	12.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		931	14.8	0.247	0.7	NA	0.0	0.0	0.00	0.03	98.2
North: Hume Highway											
8	T	865	21.7	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		865	21.7	0.253	0.0	NA	0.0	0.0	0.00	0.00	100.0
West: Red Hills Road											
10	L	36	85.3	0.477	78.8	LOS F	1.7	20.2	0.94	1.07	24.3
Approach		36	85.3	0.477	78.8	LOS F	1.7	20.2	0.94	1.07	24.3
All Vehicles		1832	19.4	0.477	1.9	NA	1.7	20.2	0.02	0.04	93.5

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 South Marulan Road East Side AM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	21	0.0	0.017	6.7	LOS A	0.1	0.6	0.24	0.50	49.7
3	R	1	0.0	0.017	11.5	LOS A	0.1	0.6	0.24	0.73	46.0
Approach		22	0.0	0.017	6.9	LOS A	0.1	0.6	0.24	0.51	49.5
East: South Marulan Road											
4	L	9	44.4	0.034	8.4	LOS A	0.2	1.4	0.26	0.54	49.7
5	T	23	31.8	0.034	6.9	LOS A	0.2	1.4	0.26	0.45	50.3
Approach		33	35.5	0.034	7.4	LOS A	0.2	1.4	0.26	0.48	50.2
North: Highway Off Ramp											
7	L	12	45.5	0.076	8.0	LOS A	0.3	3.7	0.14	0.48	50.2
8	T	12	0.0	0.076	5.6	LOS A	0.3	3.7	0.14	0.40	51.1
9	R	46	77.3	0.076	13.7	LOS A	0.3	3.7	0.14	0.69	46.1
Approach		69	59.1	0.076	11.4	LOS A	0.3	3.7	0.14	0.61	47.5
West: South Marulan Road											
11	T	16	26.7	0.016	6.1	LOS A	0.1	0.7	0.02	0.45	52.2
12	R	4	50.0	0.016	12.6	LOS A	0.1	0.7	0.02	0.87	46.5
Approach		20	31.6	0.016	7.5	LOS A	0.1	0.7	0.02	0.53	50.8
All Vehicles		144	40.9	0.076	9.3	LOS A	0.3	3.7	0.16	0.55	48.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: With Project 2025 South Marulan Road East Side PM Peak

Interchange Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
South: Jerrara Road											
1	L	20	5.3	0.016	6.8	LOS A	0.1	0.5	0.21	0.50	49.9
3	R	1	0.0	0.016	11.4	LOS A	0.1	0.5	0.21	0.74	46.1
Approach		21	5.0	0.016	7.0	LOS A	0.1	0.5	0.21	0.51	49.7
East: South Marulan Road											
4	L	17	0.0	0.030	6.8	LOS A	0.1	1.0	0.28	0.53	49.6
5	T	21	5.0	0.030	6.1	LOS A	0.1	1.0	0.28	0.45	50.2
Approach		38	2.8	0.030	6.4	LOS A	0.1	1.0	0.28	0.49	49.9
North: Highway Off Ramp											
7	L	7	28.6	0.071	7.8	LOS A	0.3	2.9	0.20	0.50	49.9
8	T	23	0.0	0.071	5.9	LOS A	0.3	2.9	0.20	0.42	50.6
9	R	31	100.0	0.071	14.7	LOS B	0.3	2.9	0.20	0.72	44.5
Approach		61	53.4	0.071	10.5	LOS A	0.3	2.9	0.20	0.58	47.0
West: South Marulan Road											
11	T	9	22.2	0.038	6.0	LOS A	0.2	1.3	0.02	0.40	52.2
12	R	54	2.0	0.038	11.2	LOS A	0.2	1.3	0.02	0.74	46.5
Approach		63	5.0	0.038	10.4	LOS A	0.2	1.3	0.02	0.69	47.2
All Vehicles		183	20.7	0.071	9.2	LOS A	0.3	2.9	0.15	0.59	47.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: With Project 2025 South Marulan Road West Side AM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	6	16.7	0.033	10.1	LOS A	0.1	1.0	0.17	0.57	47.4
2	T	1	0.0	0.033	8.3	LOS A	0.1	1.0	0.17	0.53	48.6
3	R	15	28.6	0.033	11.4	LOS A	0.1	1.0	0.17	0.73	46.7
Approach		22	23.8	0.033	10.9	LOS A	0.1	1.0	0.17	0.67	47.0
East: South Marulan Road											
5	T	22	23.8	0.086	0.2	LOS A	0.4	3.9	0.11	0.00	57.3
6	R	72	48.5	0.086	11.0	LOS A	0.4	3.9	0.11	0.77	47.9
Approach		94	42.7	0.086	8.4	NA	0.4	3.9	0.11	0.59	49.9
West: South Marulan Road											
10	L	14	38.5	0.011	9.6	LOS A	0.0	0.0	0.00	0.71	49.0
11	T	2	50.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		16	40.0	0.011	8.3	NA	0.0	0.0	0.00	0.61	50.2
All Vehicles		132	39.2	0.086	8.8	NA	0.4	3.9	0.10	0.60	49.4

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 used.

MOVEMENT SUMMARY

Site: With Project 2025 South Marulan Road West Side PM Peak

Interchange Give Way Intersection

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow 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
South: Highway Off Ramp											
1	L	6	16.7	0.046	10.0	LOS A	0.2	1.3	0.14	0.58	47.6
2	T	2	0.0	0.046	8.1	LOS A	0.2	1.3	0.14	0.54	48.8
3	R	26	8.0	0.046	10.4	LOS A	0.2	1.3	0.14	0.72	46.9
Approach		35	9.1	0.046	10.2	LOS A	0.2	1.3	0.14	0.69	47.1
East: South Marulan Road											
5	T	9	55.6	0.077	0.6	LOS A	0.3	3.3	0.21	0.00	54.7
6	R	64	47.5	0.077	11.3	LOS A	0.3	3.3	0.21	0.71	47.6
Approach		74	48.6	0.077	9.9	NA	0.3	3.3	0.21	0.62	48.4
West: South Marulan Road											
10	L	32	16.7	0.039	8.8	LOS A	0.0	0.0	0.00	0.85	49.0
11	T	38	2.8	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		69	9.1	0.039	4.0	NA	0.0	0.0	0.00	0.39	54.4
All Vehicles		178	25.4	0.077	7.7	NA	0.3	3.3	0.12	0.54	50.3

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 used.

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